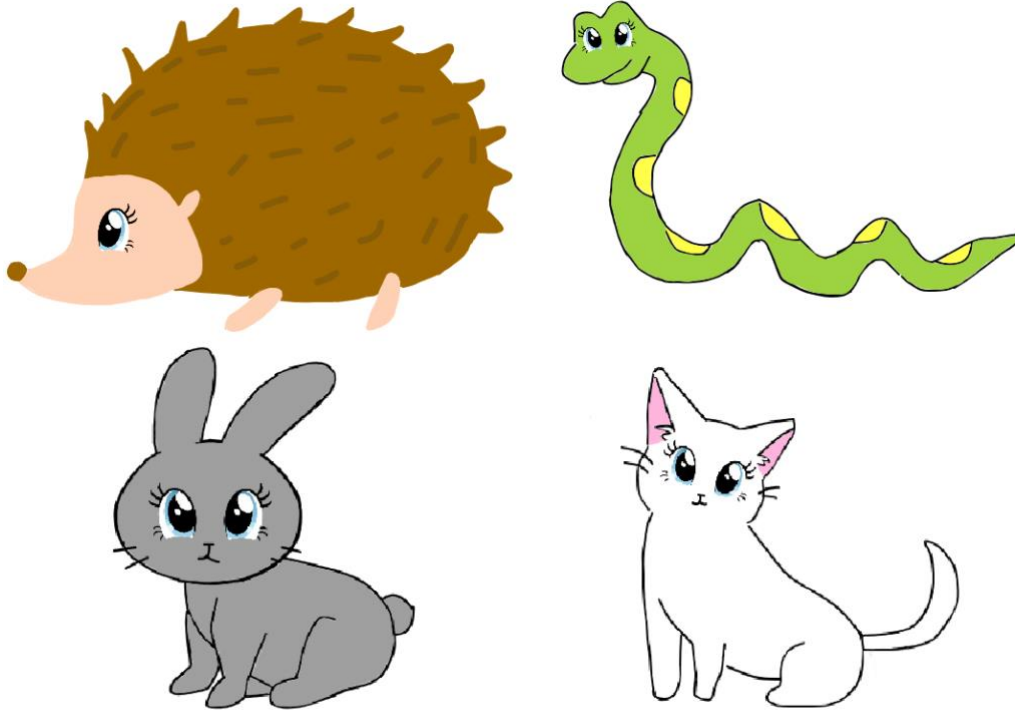


Pet Power Down



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Executive Summary

G3 Studios has charged our game development team with creating a videogame that is accessible to the visually impaired because the company wants to broaden its target audience to be more inclusive, especially of the visually impaired.

To create a game that addresses the needs of the visually impaired, we needed to design an entire game to be independent of visuals. By including audio cues to every part of the game and graphics that eliminate the advantages of sighted users, easy navigation of the menus and equality of difficulty between sighted and non-sighted users are ensured.

To meet the goals of G3 Studios, we made the game *Pet Power Down*. The objective of *Pet Power Down* is to find your pet in the room during a power outage. Users use arrow keys to move around and they navigate the room utilizing directional sound, like a thump when running into an obstacle and barking from the direction the dog is relative to the player's position. The game is designed so that players don't need to depend on their sight to finish levels. It can be played by anyone throughout the whole spectrum of visual impairments.

Pet Power Down consists of 24 levels, each increasing in difficulty, challenging the player. The beginning levels allow the user to get accustomed to following the pet sounds to reach the pet. The following levels incorporate harder to navigate room layouts and multiple pets in the room, making it difficult to distinguish the different pet sounds being played. With varying room layouts and pets, the user must depend on their hearing to complete the various levels, improving their audio recognition skills. Our intended audience are young children with visual impairments. We are positive that our pet themed game will peak young children's interest.

The purpose of this manual is to describe the intent and workings of *Pet Power Down*, our visually accessible game, to pertinent internal employees of G3 Studios. This manual discusses target audiences, user gameplay experiences, our coding approach, design aspects of *Pet Power Down*, installation instructions, and what's next in store for our game.

Introduction

When originally researching on how to create a game for our intended audience of non-sighted players, we found that a common problem that players with visual impairments face in most games is not being able to have the full game experience compared to users who don't have the same disadvantage. We created *Pet Power Down* trying to ensure an equality of difficulty between sighted and non-sighted users. Our game reduces the importance of relying on sight to play a game, by incorporating audio cues. *Pet Power Down* creates an engaging gameplay experience where users depend on their hearing to play

G3 Studios' software development team is pleased to announce the final release of our game, *Pet Power Down*. This manual lays out the objectives and features, development process, gameplay experience, and how our game ties into G3's mission on creating a game for the visually impaired.

Game Overview

Pet Power Down's primary target audience is young children who have partial blindness and need help overcoming a fear of the dark. Since they can observe that the room is dark and must rely on their audio senses while playing the game, the children realize that navigating in the dark is not a scary feat after all. A secondary audience is young children with complete blindness. The game's independence from sight allows completely blind children to fully enjoy the game as well learn how to locate items using sound. The tertiary audience is young sighted children. Since much of the game board is blocked out by darkness, the game is still challenging to them and teaches them to be more perceptive of sounds.

Game Objectives and Features

The objective of *Pet Power Down* is to find the pet in the dark during a power outage. The player will be positioned at a random spot in the room and the user will use arrow keys to navigate the player around the room to reach the pet. The flashlight feature allows the user to view a small radius of area surrounding the player. However, since the room is mainly dark, the user won't need to depend on their vision to move around.

We wanted this game to be heavily audio based, so directional audio is a main factor in helping the visually impaired to complete the levels. If the player bumps into an obstacle, like a chair or wall, then a "thump" will signal the user to maneuver around it. The pet will also make a sound every three steps taken. The sound played will depend on the pet's position respective to that of the player. For example, the closer the player is to the pet, the louder the sound will play.

The player will move one spot for every one press of the arrow key. This feature is implemented to keep track of the number of steps taken. For the player to successfully find the pet and complete the level, they would need to move to the exact location of the pet. When this happens, an end screen will pop up that will display options to go back to the main menu, navigate to the level select, or continue to the next level.

We received feedback from our alpha release that our levels are too easy to beat, so we wanted to make the game more challenging so the user wouldn't be bored playing it. A feature we included is that the pet moves a space for every three steps the player takes. In the earlier levels, the pet would move towards the player's position, so it would be easier to complete the level. However, in the following levels, the pet would move away from the player and the goal is to find the pet before it has the chance to escape the room.

Pet Power Down is an interactive game for visually impaired to improve their audio recognition skills without having a disadvantage compared to other users.

Meeting G3's Mission

Most games are heavily depended on the visuals, so players with visual impairments are not able to have the full experience. However, *Pet Power Down* gives the same experience for both visually impaired and regular players. The game is audio based, instead of visual based, so users can complete levels by listening to the sounds and following the direction from where it is played from. This can help the player to improve their audio recognition skills by correctly identifying the pet sound and going along in a course towards the location of where the sound is played. This skill can be carried over and be utilized in the visually impaired users' everyday lives. By creating a game that doesn't discriminate against visually impaired players, and is not only fun, but also incorporates a learning experience, *Pet Power Down* succeeds to meet G3's mission.

Game Experience Narrative

I launch the game and I'm met with a simplistic menu with the game title, "Pet Power Down" at the top, and an audio queue to notify me that I am on the level selection button. I navigate down using the arrow keys to listen to the voiceovers for both the instruction and option buttons. I decide on settings, and press space to enter the settings menu. I press space to change my voiceover setting to off and then the escape button to go back to the main menu.

Navigating to level selection, I press space again and see 24 levels neatly aligned in rows. Most have a lock on them due to lack of completion. I select level three, the last of my unlocked levels and I am presented with a view of a girl with blonde pigtails clad with a blue dress, moving her legs as if she were walking. She is cloaked with a spotlight type shadow that restricts her view. I press down on the arrow keys to move the girl around and after every few presses, I hear the faint sound of a dog barking to the lower right of me.

I close my eyes to focus on the direction of the animal sounds. I slowly alternate between the down and right arrow keys as I hear the dog's barking get gradually closer to me. I feel as if I am right next to the dog, but the next turn, it gets slightly further away. At this point, I realize that the dog has moved past me, and is now woofing on my left. I make my final move and hear the dog bark one last time as I capture him and finish the level. A screen pops up congratulating me on finishing the level. There are also buttons for me to navigate back to the main menu, the level select, and the next level. As I work my way through the next few levels, I notice how the pets and layouts of the game's house changes every time. As the game's difficulty increases level by level, I eventually encounter a room filled with multiple pets and obstacles, such as a kitchen table and chairs.

After twenty-four levels of Pet Power Down, I finally encounter a familiar face, the game end screen, congratulating me for my dedication to my many pets. I press escape and return to the main menu, closing down my game to be beaten once again in the future.

Game Design Reference

Coding Approach

The methods used to create *Pet Power Down* involved a hybrid of the code-and-fix and prototype process models. The prototype part of the approach was ideal because it allowed for the game to quickly be put together without a high priority on perfection and polish, which was ideal when putting the game together to a functioning state for the alpha and beta releases.

Additionally, as there were only two assigned developers on the team, the code-and-fix approach worked well for quickly implementing features that could then be improved on later. This approach was also effective because when implementing solutions to problems in the code, they would likely not interfere with other parts of the game, and nobody would have to deal with understanding code they didn't write.

Although most of the code was originally put together as drag-and-drop, it was slowly phased out over time coding in GameMaker language. While drag and drop was beneficial for setting up early parts of the game, scripting ultimately served the game better by allowing more nuance in game interactions that would otherwise not be possible in the original approach while also being able to be put together much faster due to not having to manually move blocks of code together.

The ultimate results of this approach can be found in Appendices A, showing a coding sample of a section that would be incredibly difficult to create in block code and across different people, and in Appendix B, which shows UML state-chart and class-chart diagrams for *Pet Power Down* as a higher-level view of how parts of the game interact.

Modular Breakdown

Main Menu

The main menu screen seen below in Figure 1 is the first screen that the player encounters when they first load up the game. The screen displays the name of the game as well as buttons to move to other screens, which can be selected using the arrow keys. When a button is selected, it will grow larger and will appear to glow with changing colors, and a voice-over of the text is played if the option is selected. To select an option, the player can press the enter or space key. Additionally, the player can return to this screen at any point by hitting the escape key.

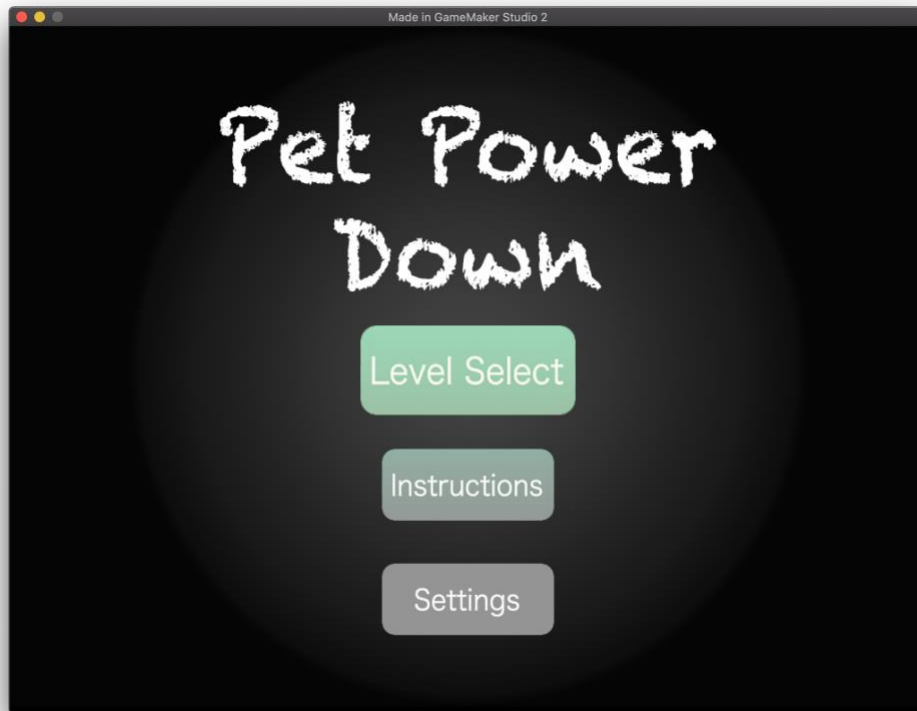


Figure 1: Main Menu Screen

Main Menu Components

- Level Select Button: Takes the player to the level select screen, shown in Figure 2.
- Instructions Button: Takes the player to the instructions screen, where they can learn about how to play the game and other information they may want to know.
- Settings Button: Takes the player to the settings screen, where they can adjust settings like enabling/disabling the voiceover, enabling/disabling the flashlight effect in the game, and volume adjustment.

Level Select

The level select screen seen below in Figure 2 is where the player gets taken to after selecting the level select button on the main menu screen. The screen displays the 24 levels in the game, represented by a number on each. When the enter key is pressed, the player is taken to level corresponding to the number on the button. Just as with the buttons on the main screen, the buttons grow larger and glow when selected, and a voice-over of the level number is played when it is initially selected. Players cannot enter levels with locks over them, but as more levels are completed, more locks are removed from the levels, allowing players to access new levels.



Figure 2: Level Select Screen

Level Select Components

- **Unlocked Level Buttons:** Brings the user to the selected level. The user can only open the level if the button doesn't have a lock on it.
- **Locked Level Buttons:** The user cannot play the level until they complete previous levels. These buttons will have a lock in the middle.

Instructions

The user can be brought to the instructions screen seen in Figure 3 by pressing the enter or space key to select the Instructions button in the main menu. The instructions screen informs the user to navigate to the level select to pick a level to play. It also explains that the user needs to use the keyboard keys to move around and to complete the level, the user needs to make contact with the pet. The instructions also explain what the different noises that are played in the game means. The pet sound will be played in the direction of where the pet is relative to the player. The thump sound will play when the player runs into an obstacle in the room. The instructions also explain the end screen that the player is met with when the level is complete and how the user can navigate back to the main menu, level select, or the next level.

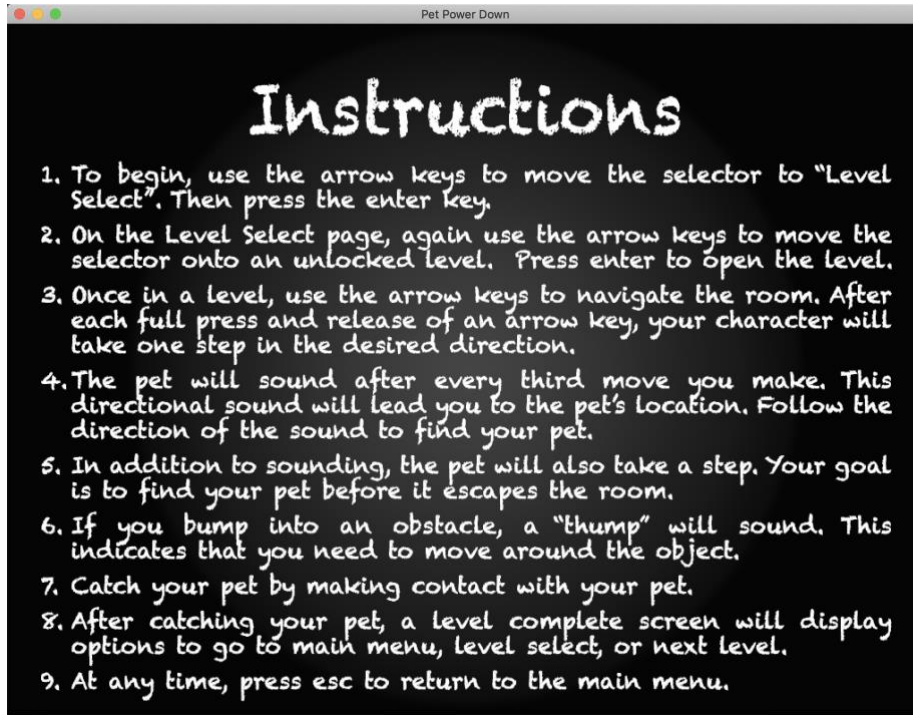


Figure 3: Instructions Screen

Settings

The Settings screen shown in Figure 4 is where the user is taken after selecting the Settings button in the Main Menu. The Settings screen allows the user to change the voiceover, the flashlight mode, and the level unlock options in the game. Just as with the buttons on the main screen and level select, the buttons grow larger and glow when selected, and a voice-over of the button that is selected will play.

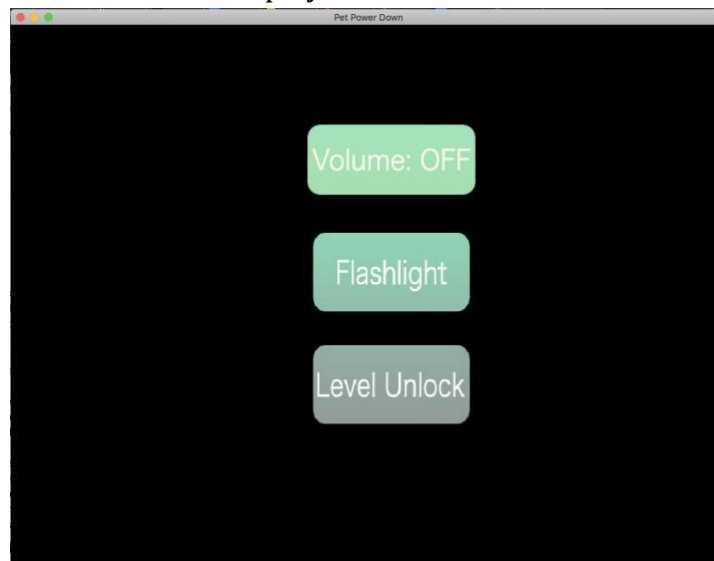


Figure 4: Settings Screen

Settings Screen Components

- Volume Button: Turns the voiceovers in the game on or off. If the voiceovers option is originally on and this button is selected, it will turn to Volume: ON, which allows the user to turn the voiceovers back on if this button is selected again.
- Flashlight Button: This button allows the user to change the flashlight option. The user can either keep the flashlight, change it to dark mode, where there is no flashlight and the only thing visible on the screen is the player, and sight mode, where the user can see the exact room layout of the level.
- Level Unlock: This cheat code allows the user to unlock all 24 levels and they aren't restricted to only being able to play the levels that are unlocked.

Level 1

When starting level 1, the player is taken to a house, shown in Figure 5, that they need to navigate through in order to find the pets within the room. The player can navigate using the arrow keys, and after three moves, the dog in the room will make some sort of movement in response. After a dog finishes its movements, it will play a sound using 3D audio to point the player towards its relative position. After the player and dog reach each other, the dog will be saved from the dark and the level is completed and the player can therefore progress further.

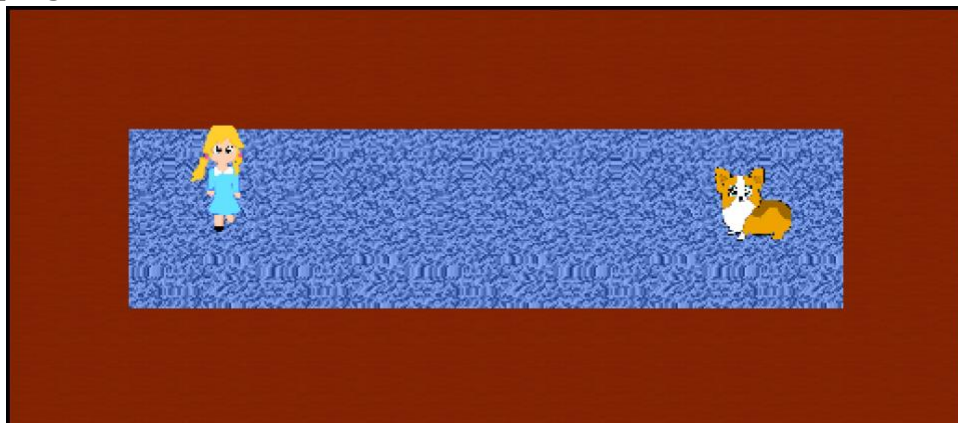


Figure 5: Level 1 room layout

Level 1 Components

- Blonde Girl (left side of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.

- **Brown Corgi (right side of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles seen in Figure 5 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.

Level 2

After completing the previous level, the user is faced with the room layout of the second level, shown in Figure 6. The player and the dog move in the same manner as the last level. The dog will make barking sounds to indicate its location to the user.

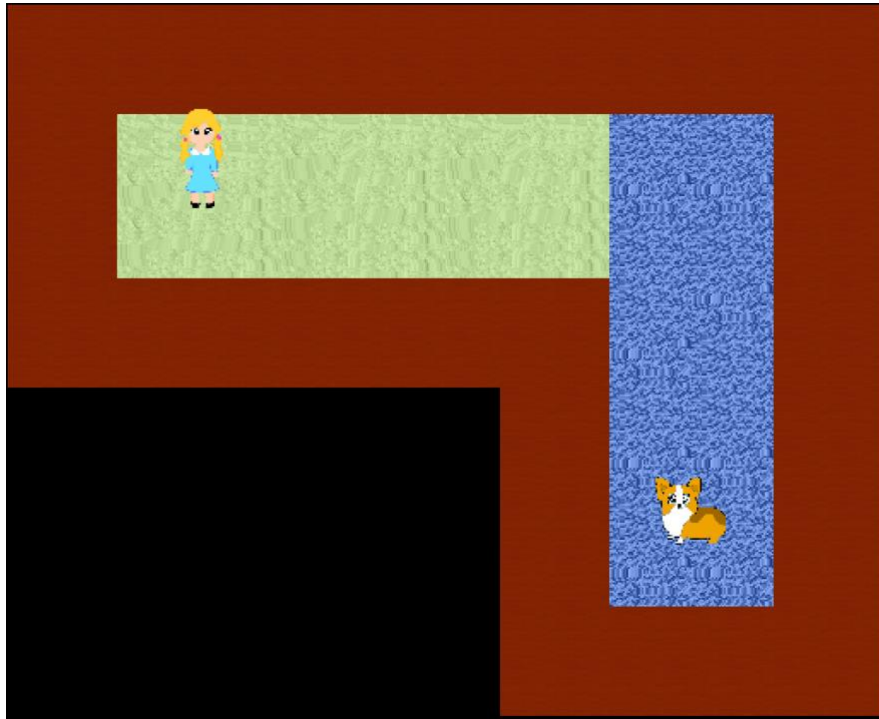


Figure 6: Level 2 room layout

Level 2 Components

- **Blonde Girl (top left of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the

pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.

- Brown Corgi (bottom right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green and blue tiles seen in Figure 6 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.

Level 3

After completing level 2, the user can proceed to level 3, where the flashlight is first introduced. The flashlight allows the player to see a small radius of area around where the player is positioned in the room. However, other than the flashlight, everything else in the game is held constant. There is still a dog in the room that will bark in the direction relative to the player's and there is still the player which the user needs to move around to reach the pet. The room layout changed from the last two levels.

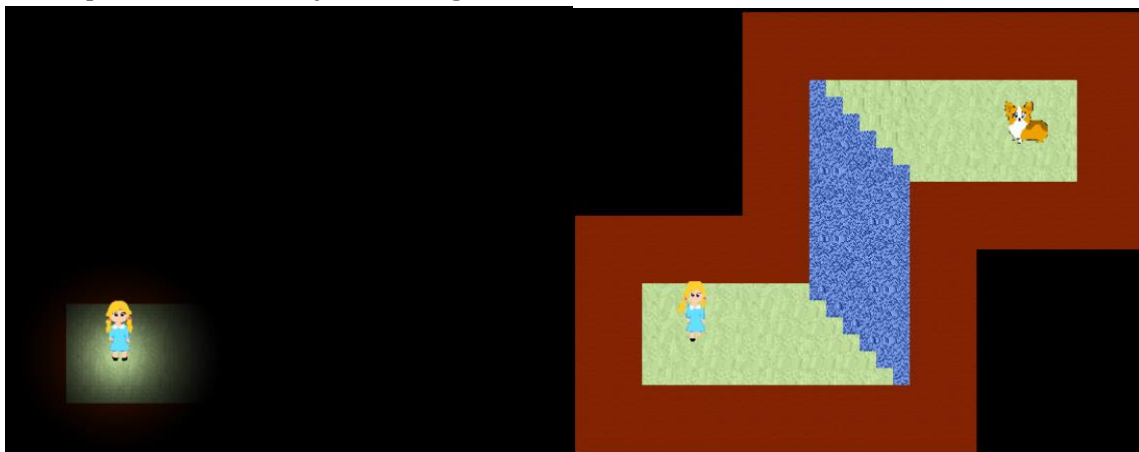


Figure 7 and 8: Level 3 with and without the "flashlight" effect enabled.

Level 3 Components

- Blonde Girl (bottom left of room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the

player walks into a wall in the room, a sound will be played and the move will not be counted.

- Brown Corgi (top right of room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 8 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: The flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.

Level 4

After finishing level 3, the user can move onto level 4. The room layout of this level is shown below in Figure 9. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. A new addition to this level is obstacles that are placed in the room. A thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. Another change is the brown corgi changed into a white cat, so the pet sound will not be a bark, but a meow instead.

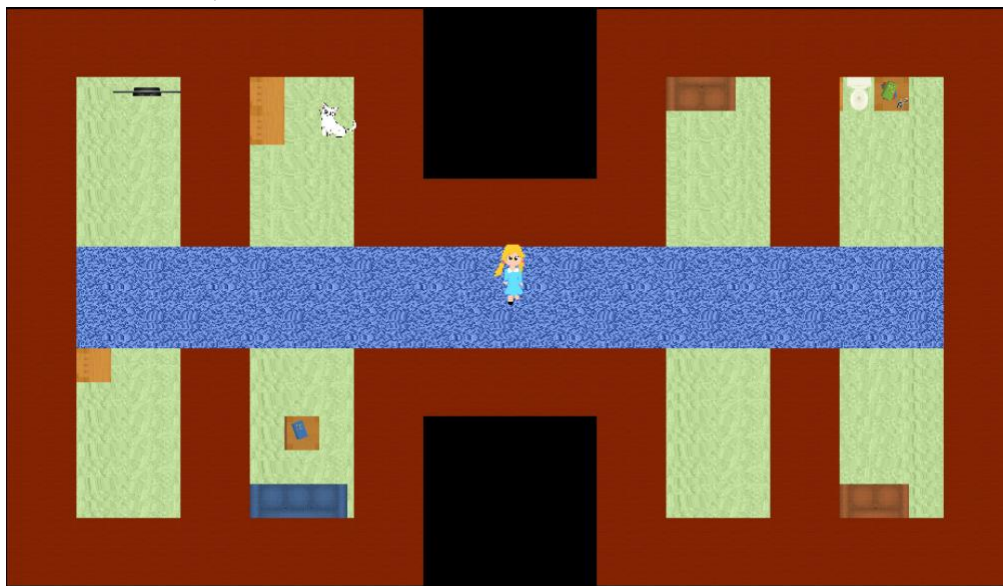


Figure 9: Level 4 layout

Level 4 Components

- **Blonde Girl (center of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **White Cat (top of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 9 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 9, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **TV (top of the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Wooden Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Red and Blue Couches (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 5

After finishing level 4, the user can move onto level 5. The room layout of this level is shown below in Figure 10. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. More obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same

time. The cat in the room will make a meowing sound and the dog will make a barking sound.



Figure 10: Level 5 layout

Level 5 Components

- Blonde Girl (center of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- White Cat (bottom right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- Brown Corgi (top left of room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 10 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 10, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision

as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.

- TV (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Blue Couch (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Dinner Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 6

After finishing level 5, the user can move onto level 6. The room layout of this level is shown below in Figure 11. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. More obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The cat in the room will make a meowing sound and the dog will make a barking sound.



Figure 11: Level 6 layout

Level 6 Components

- **Blonde Girl (bottom left of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **White Cat (top right of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- **Brown Corgi (bottom right of room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 11 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 11, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **Wooden Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Blue Couch (bottom right of the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Lamp (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Toilet (top right of room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 7

After finishing level 6, the user can move onto level 7. The room layout of this level is shown below in Figure 12. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The cat in the room will make a meowing sound and the dog will make a barking sound.

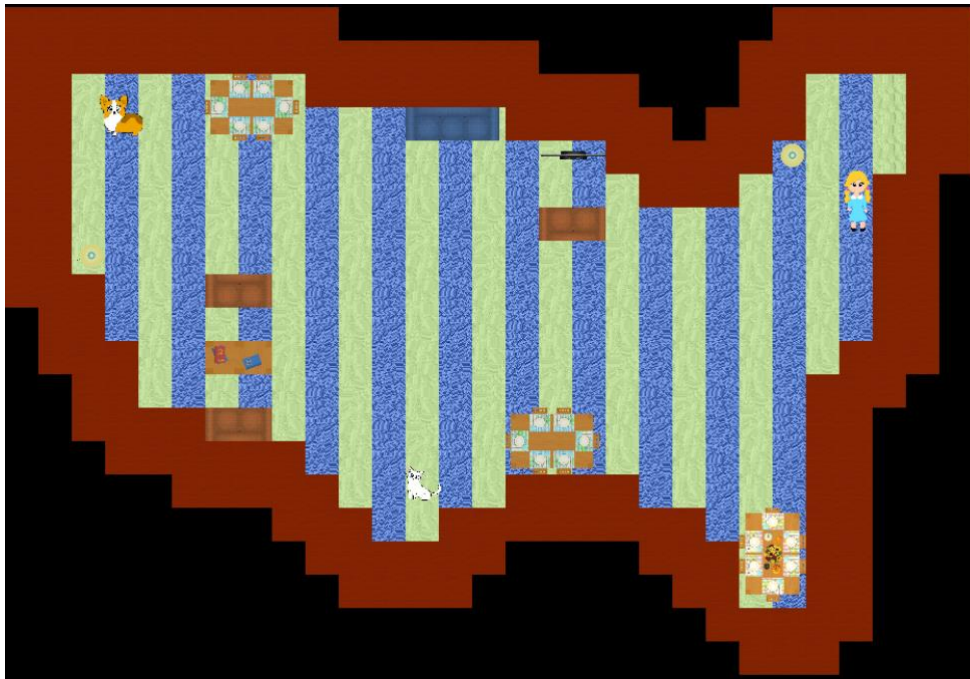


Figure 12: Level 7 layout

Level 7 Components

- Blonde Girl (top right of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- White Cat (bottom center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.

- Brown Corgi (top left of room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 12 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 12, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Wooden Table (bottom left of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Dinner Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Red and Blue Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (top center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 8

After finishing level 7, the user can move onto level 8. The room layout of this level is shown below in Figure 13. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. A grey bunny is introduced in this level and it will make a crunching noise, as if it is chomping on a carrot.

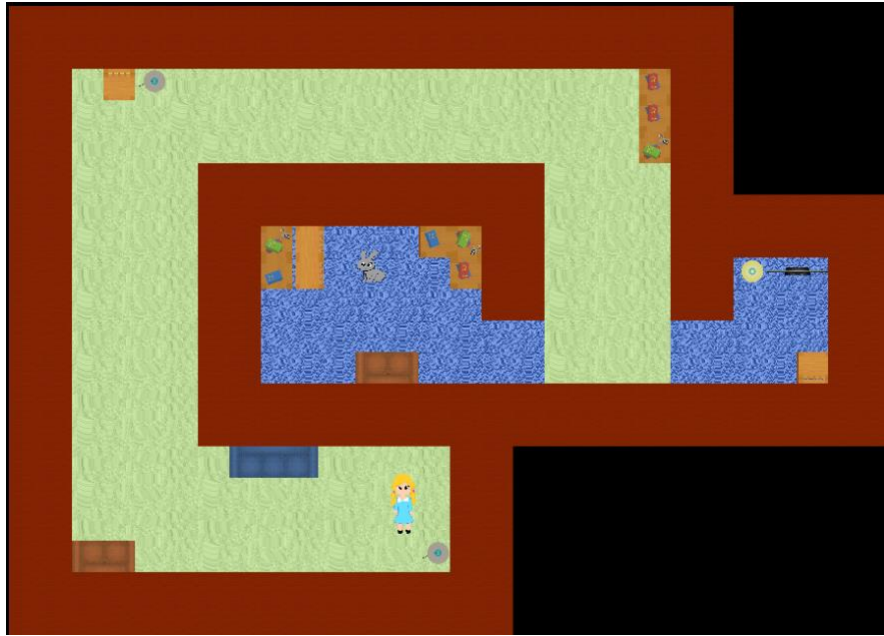


Figure 13: Level 8 layout

Level 8 Components

- **Blonde Girl (bottom center of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Grey Bunny (bottom center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 13 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 13, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **Wooden Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

- Blue and Red Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamps (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (center right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 9

After finishing level 8, the user can move onto level 9. The room layout of this level is shown below in Figure 14. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are three pets in this level, so there are three different pet sounds playing at the same time. The cat in the room will make a meowing sound, the dog will make a barking sound, and the bunny will make a crunching noise, as if it is chomping on a carrot.



Figure 14: Level 9 layout

Level 9 Components

- **Blonde Girl (bottom center of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Grey Bunny (bottom left of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- **White Cat (top center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- **Brown Corgi (top center of room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 14 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 14, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **Red and Blue Couches (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Dinner Table (bottom left of the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Toilet (top center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (top center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 10

After finishing level 9, the user can move onto level 10. The room layout of this level is shown below in Figure 15. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are three pets in this level, so there are three different pet sounds playing at the same time. The cat in the room will make a meowing sound, the dog will make a barking sound, and the bunny will make a crunching noise, as if it is chomping on a carrot.



Figure 15: Level 10 layout

Level 10 Components

- **Blonde Girl (top right of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Grey Bunny (top center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- **White Cat (center left of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- **Brown Corgi (bottom right of room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 15 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 15, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **Wooden Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Dinner Table (bottom right of the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

- Red and Blue Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamps (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 11

After finishing level 10, the user can move onto level 11. The room layout of this level is shown below in Figure 16. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. A green snake is introduced in this level and it makes a hissing sound. There are two pets in this level, so there are two different pet sounds playing at the same time. The dog will make a barking sound and the snake will make a hissing sound.



Figure 16: Level 11 layout

Level 11 Components

- **Blonde Girl (bottom left of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Green Snake (top center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the snake has a random chance to take a step or not move. After the snake's move, it will play a hissing sound from its position, cluing the player in on where it is located. The snake is saved when either the player reaches it, or when it reaches the player.
- **Brown Corgi (bottom right of room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 16 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 16, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **Dinner Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Wooden Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Lamp (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Red and Blue Couches (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

- Toilet (center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (center right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 12

After finishing level 11, the user can move onto level 12. The room layout of this level is shown below in Figure 17. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The dog will make a barking sound and the bunny will make a crunching sound.

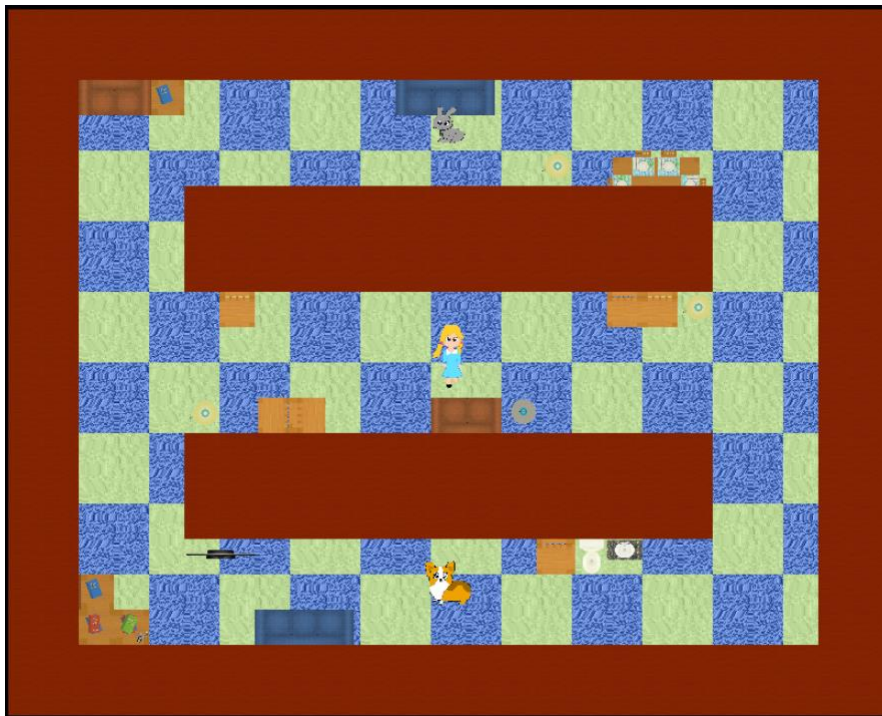


Figure 17: Level 12 layout

Level 12 Components

- Blonde Girl (center of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.

- Brown Corgi (bottom center of room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Grey Bunny (top center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 17 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 17, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Blue and Red Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (bottom left of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Toilet (bottom right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (bottom right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Dinner Table (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 13

After finishing level 12, the user can move onto level 13. The room layout of this level is shown below in Figure 18. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. A brown porcupine is introduced in this level and it makes a rustling sound. There are two pets in this level, so there are two different pet sounds playing at the same time. The snake will make a hissing sound and the porcupine will make a rustling sound.

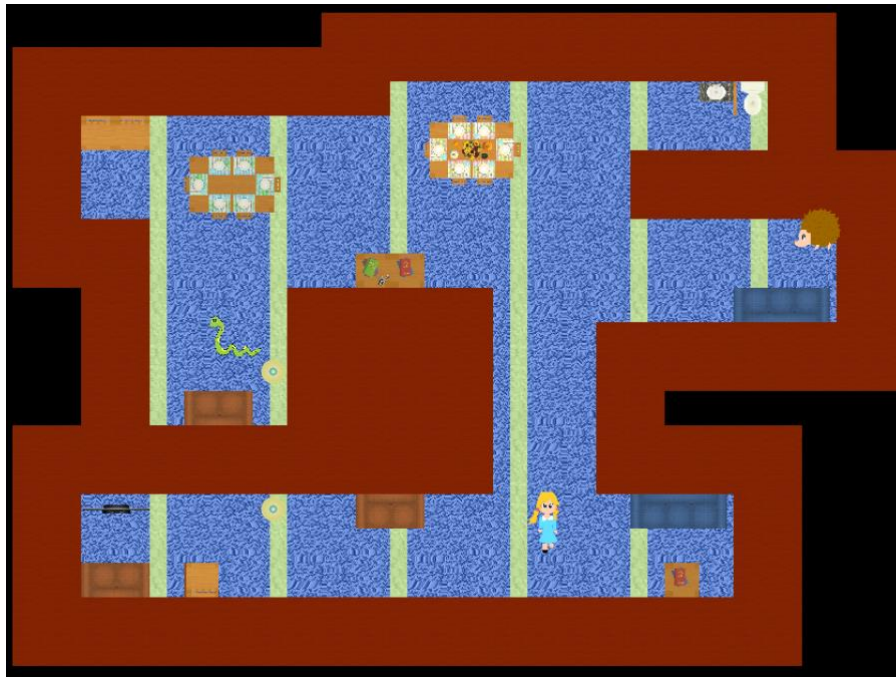


Figure 18: Level 13 layout

Level 13 Components

- Blonde Girl (bottom right of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- Brown Porcupine (center right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the porcupine has a random chance to take a step or not move. After the porcupine's move, it will play a rustling sound from its position, cluing the player in on where it is located. The porcupine is saved when either the player reaches it, or when it reaches the player.

- Green Snake (center left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the snake has a random chance to take a step or not move. After the snake's move, it will play a hissing sound from its position, cluing the player in on where it is located. The snake is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 18 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 18, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Blue and Red Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (bottom left of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Dinner Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Toilet (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 14

After finishing level 13, the user can move onto level 14. The room layout of this level is shown below in Figure 19. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The dog will make a barking sound and the porcupine will make a rustling sound.



Figure 19: Level 14 layout

Level 14 Components

- Blonde Girl (top left of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- Brown Corgi (bottom right of room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Brown Porcupine (top right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the porcupine has a random chance to take a step or not move. After the porcupines's move, it will play a

rustling sound from its position, cluing the player in on where it is located. The porcupine is saved when either the player reaches it, or when it reaches the player.

- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 19 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 19, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Blue and Red Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Dinner Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (top center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (top center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 15

After finishing level 14, the user can move onto level 15. The room layout of this level is shown below in Figure 20. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The dog will make a barking sound and the cat will make a meowing sound.

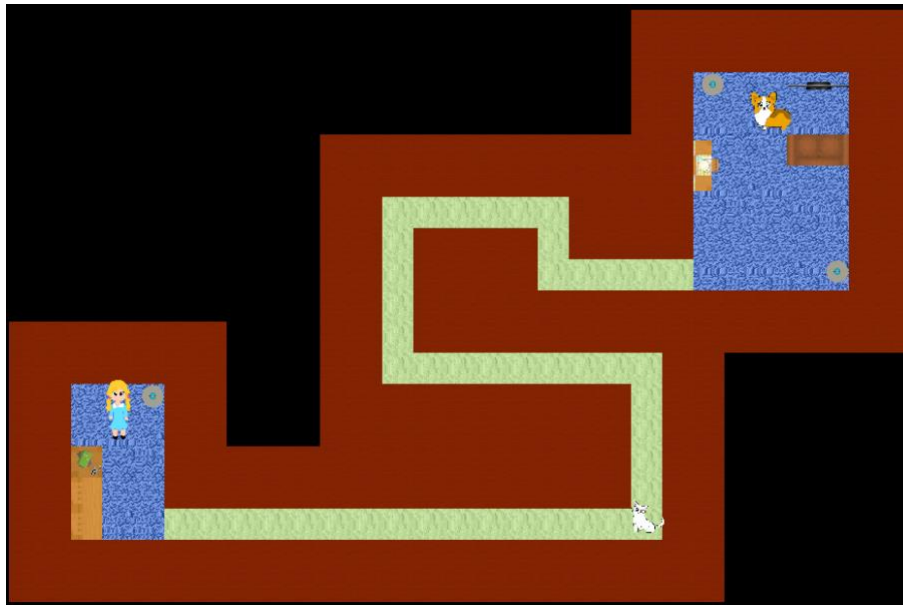


Figure 20: Level 15 layout

Level 15 Components

- **Blonde Girl (bottom left of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Brown Corgi (top right of room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **White Cat (bottom right of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 20 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 20, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move

around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.

- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Red Couch (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 16

After finishing level 15, the user can move onto level 16. The room layout of this level is shown below in Figure 21. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are three pets in this level, so there are three different pet sounds playing at the same time. The dog will make a barking sound, the cat will make a meowing sound, and the snake will make a hissing sound.



Figure 21: Level 16 layout

Level 16 Components

- **Blonde Girl (center right of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Brown Corgi (center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **White Cat (center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- **Green Snake (center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the snake has a random chance to take a step or not move. After the snake's move, it will play a hissing sound from its position, cluing the player in on where it is located. The snake is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 21 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 21, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **Wooden Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Dinner Table (top right of the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

- Red Couch (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 17

After finishing level 16, the user can move onto level 17. The room layout of this level is shown below in Figure 22. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The dog will make a barking sound and the cat will make a meowing sound.



Figure 22: Level 17 layout

Level 17 Components

- Blonde Girl (center of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the

player walks into a wall in the room, a sound will be played and the move will not be counted.

- Brown Corgi (left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- White Cat (center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 22 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 22, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Red and Blue Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (bottom right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Dinner Table (left of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 18

After finishing level 17, the user can move onto level 18. The room layout of this level is shown below in Figure 23. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not

only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The porcupine will make a rustling sound and the bunny will make a crunching sound.



Figure 23: Level 18 layout

Level 18 Components

- Blonde Girl (center right of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- Grey Bunny (left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- Brown Porcupine (center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the porcupine has a random chance to take a step or not move. After the porcupine's move, it will play a rustling sound from its position, cluing the player in on where it is located. The porcupine is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 23 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.

- Flashlight: Not shown in Figure 23, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Red and Blue Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Toilet (right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 19

After finishing level 18, the user can move onto level 19. The room layout of this level is shown below in Figure 24. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are two pets in this level, so there are two different pet sounds playing at the same time. The porcupine will make a rustling sound and the bunny will make a crunching sound.



Figure 24: Level 19 layout

Level 19 Components

- **Blonde Girl (center right of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Grey Bunny (left of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- **Brown Porcupine (center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the porcupine has a random chance to take a step or not move. After the porcupine's move, it will play a rustling sound from its position, cluing the player in on where it is located. The porcupine is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 24 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- **Flashlight:** Not shown in Figure 24, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- **Wooden Table (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Toilet (right of the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Sink (right of the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- **Red and Blue Couches (scattered around the room):** A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 20

After finishing level 19, the user can move onto level 20. The room layout of this level is shown below in Figure 25. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. The dog is the only pet in this level, and the dog will make a barking sound.

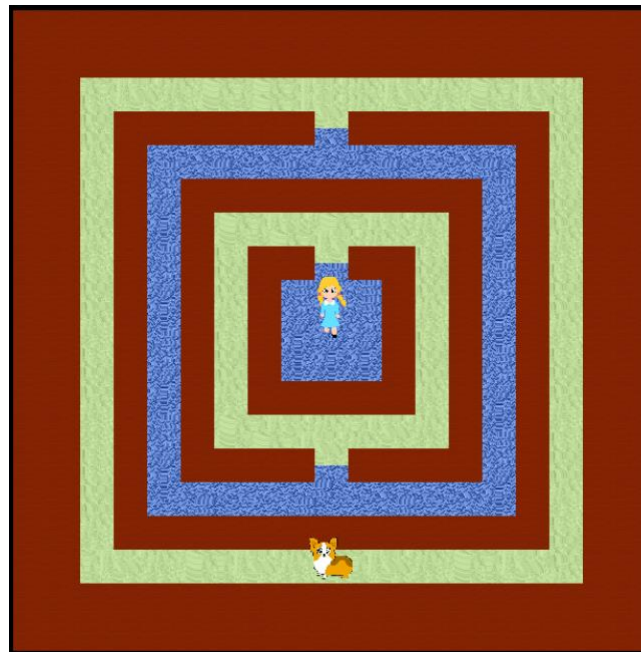


Figure 25: Level 20 layout

Level 20 Components

- **Blonde Girl (center right of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Brown Corgi (bottom center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- **Room:** The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 25 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.

- Flashlight: Not shown in Figure 25, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.

Level 21

After finishing level 20, the user can move onto level 21. The room layout of this level is shown below in Figure 26. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are three pets in this level, so there are three different pet sounds playing at the same time. The dog will make a barking sound, the cat will make a meowing sound and the bunny will make a crunching sound.



Figure 26: Level 21 layout

Level 21 Components

- Blonde Girl (bottom left of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- Brown Corgi (right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to

take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.

- Grey Bunny (left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- White Cat (bottom of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 26 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 26, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Red and Blue Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Toilet (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (top right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (left of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 22

After finishing level 21, the user can move onto level 22. The room layout of this level is shown below in Figure 27. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are three pets in this level, so there are three different pet sounds playing at the same time. The porcupine will make a rustling sound, the dog will make a barking sound and the snake will make a hissing sound.



Figure 27: Level 22 layout

Level 22 Components

- **Blonde Girl (right of the room):** The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- **Brown Corgi (bottom center of the room):** The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.

- Brown Porcupine (top left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the porcupine has a random chance to take a step or not move. After the porcupine's move, it will play a rustling sound from its position, cluing the player in on where it is located. The porcupine is saved when either the player reaches it, or when it reaches the player
- Green Snake (center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the snake has a random chance to take a step or not move. After the snake's move, it will play a hissing sound from its position, cluing the player in on where it is located. The snake is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 27 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 27, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Red and Blue Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (top center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (left of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 23

After finishing level 22, the user can move onto level 23. The room layout of this level is shown below in Figure 28. There is a flashlight in this level, similar to the one shown in the

previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not only play if the player runs into a wall, but also when it runs into the furniture. There are five pets in this level, so there are five different pet sounds playing at the same time. The porcupine will make a rustling sound, the dog will make a barking sound, the cat will make a meowing sound, the bunny will make a crunching sound, and the snake will make a hissing sound.

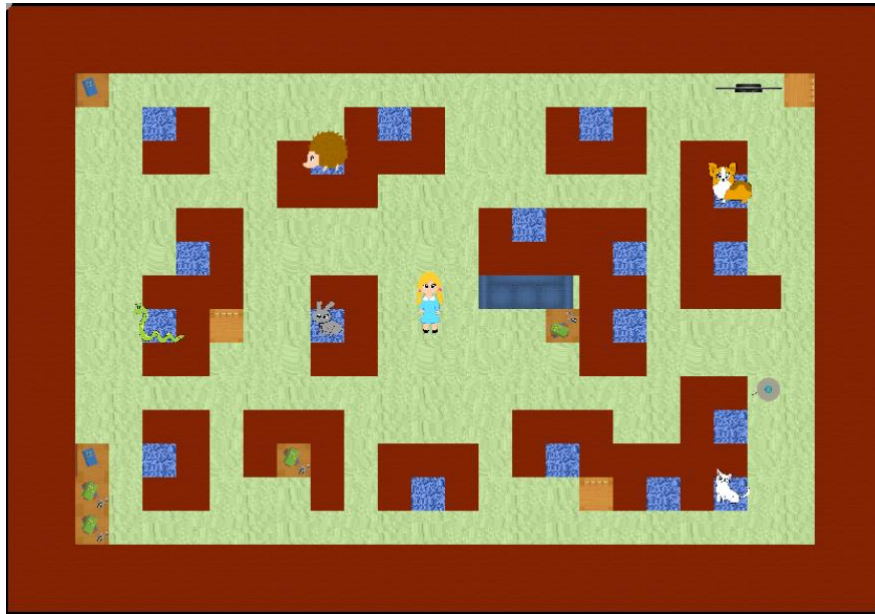


Figure 28: Level 23 layout

Level 23 Components

- Blonde Girl (center of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- Brown Corgi (top right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Brown Porcupine (top left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the porcupine has a random chance to take a step or not move. After the porcupine's move, it will play a rustling sound from its position, cluing the player in on where it is located. The porcupine is saved when either the player reaches it, or when it reaches the player.

- White Cat (bottom right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.
- Green Snake (center left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the snake has a random chance to take a step or not move. After the snake's move, it will play a hissing sound from its position, cluing the player in on where it is located. The snake is saved when either the player reaches it, or when it reaches the player.
- Grey Bunny (center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 28 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 28, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (top right the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (bottom right of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Level 24

After finishing level 23, the user can move onto level 24. The room layout of this level is shown below in Figure 29. There is a flashlight in this level, similar to the one shown in the previous level in Figure 7. Obstacles that are placed in the room and a thump sound will not

only play if the player runs into a wall, but also when it runs into the furniture. There are five pets in this level, so there are five different pet sounds playing at the same time. The porcupine will make a rustling sound, the dog will make a barking sound, the cat will make a meowing sound, the bunny will make a crunching sound, and the snake will make a hissing sound.

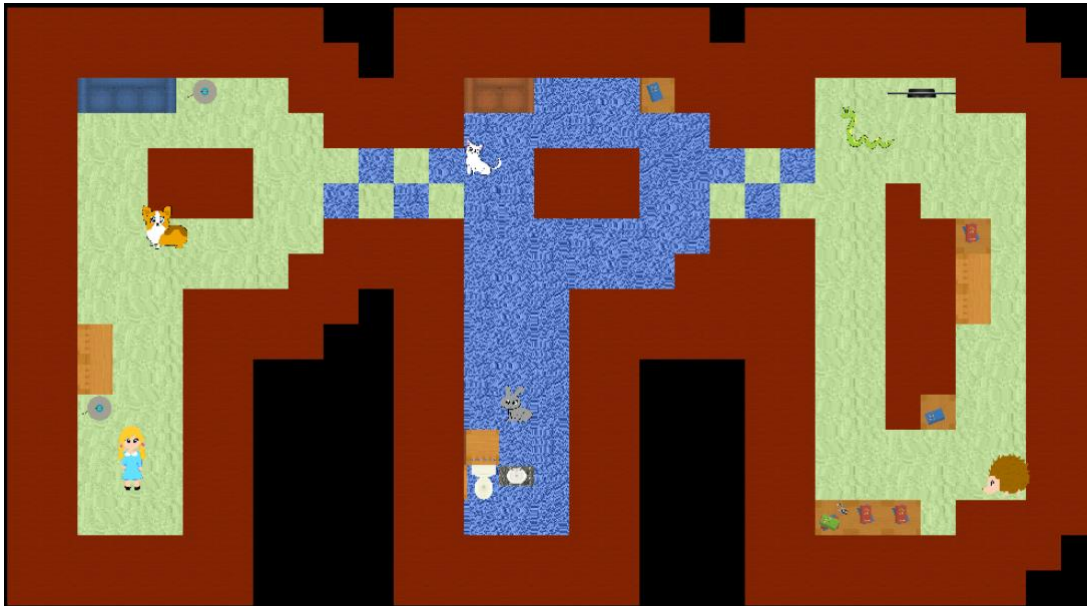


Figure 29: Level 24 layout

Level 24 Components

- Blonde Girl (bottom left of the room): The person in the house that the player controls. The girl moves up to three tiles before the pet takes its turn to make some movement, and when the girl and pet end up on the same tile, the pet is saved. If the player walks into a wall in the room, a sound will be played and the move will not be counted.
- Brown Corgi (center left of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the dog has a random chance to take a step or not move. After the dog's move, it will play a barking sound from its position, cluing the player in on where it is located. The dog is saved when either the player reaches it, or when it reaches the player.
- Brown Porcupine (bottom right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the porcupine has a random chance to take a step or not move. After the porcupine's move, it will play a rustling sound from its position, cluing the player in on where it is located. The porcupine is saved when either the player reaches it, or when it reaches the player.
- White Cat (top center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the cat has a random chance to

take a step or not move. After the cat's move, it will play a meowing sound from its position, cluing the player in on where it is located. The cat is saved when either the player reaches it, or when it reaches the player.

- Green Snake (top right of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the snake has a random chance to take a step or not move. After the snake's move, it will play a hissing sound from its position, cluing the player in on where it is located. The snake is saved when either the player reaches it, or when it reaches the player.
- Grey Bunny (bottom center of the room): The pet in the house that the player is trying to reach. After the player finishes three movements, the bunny has a random chance to take a step or not move. After the bunny's move, it will play a crunching sound from its position, cluing the player in on where it is located. The bunny is saved when either the player reaches it, or when it reaches the player.
- Room: The restricted area that the player and pet must navigate through. The green tiles and blue tiles seen in Figure 29 represent the floor of the room, and both the player and pet can freely move on it. The red tiles in the room represent the walls, which both the player and pet cannot cross over.
- Flashlight: Not shown in Figure 29, but is visible when playing the game, the flashlight effect that obscures the player's vision. Enabled by default to limit vision as shown in Figure 7, this small circle of light follows the player as they move around. The flashlight helps the user finish the level, while still making the player primarily use the sounds of pets as the main way of navigating around the space.
- Wooden Table (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- TV (top right the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Red and Blue Couches (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Lamp (scattered around the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Toilet (bottom center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.
- Sink (bottom center of the room): A furniture placed in the room as an obstacle. If the player runs into this, then a thump sound will play to signal the player to maneuver around it.

Game Installation

- 1) First launch *GameMaker Studio 2* software program on your computer. If not yet installed, check below for the installation directions needed for this program.
- 2) Click the “File” tab and then click “Open Project” in the drop down menu.
- 3) Find the folder named, “PetPowerDown_FinalRelease” and after selecting this folder, navigate to the file “PetPowerDown_FinalRelease.yyp”.
- 4) Select the “Open” button at the bottom right corner of the window.
- 5) When the file pops up, click the triangle play button at the left of the top menu bar to launch the game.

Gamemaker Studio 2 Installation

- 1) Using your web browser, search for “Gamemaker Studio 2,” or follow the link, <https://accounts.yoyogames.com/users/sign-up>.
- 2) Enter the required information while registering for “Personal Use.”
- 3) Create an account and password with yoyo games.
- 4) Click the download button for 64 bit Windows.
- 5) Navigate to downloads in windows explorer and double click the installation file.
- 6) Follow the on-screen prompts and install the program.

System Requirements

- PC with Windows XP, Vista 7, or newer models of Windows
- DirectX 9 or later with a compatible graphics card with at least 32 MB of memory
- At least a 1024 x 768 pixels resolution
- At least 512 MB of RAM
- GameMaker Studio 2 software installed

Conclusion

The Future of *Pet Power Down*

We hope to demo our game at children's hospitals that specialize in helping the visually impaired to spread interest in *Pet Power Down*. We are also considering developing a mobile version of our game to make the game easily accessible to real non-sighted children. We hope that our game will reach those who are restricted by their lack of eyesight and cannot play the majority of the games that are on the market, to show them that they can still have an engaging game experience.

Final Thoughts

Our team is ecstatic for this final release of this game we have all worked hard on for the past four months. It was incredible watching a simple pitch evolve into a full-fledged game. Piecing together all the code and sprites that each member contributed to this game created a masterpiece. We are thankful to have this opportunity to develop this game on behalf of G3 Studios.

Appendix A

Coding Sample

The following code sample is taken from the game's "script_move_pets" script file, which is used to have the pets make their set of movements after the player has taken their turn moving. Due to the large number of lines in the file, only the parts of the script pertaining to the movements of the dog and cat pets have been included, as the script is otherwise much larger and would be mostly repetitive if the movements of the other pets were to be included.

```
// Event that handle's how the pets move after the player's turn finishes

var i
var j
// Loop through all the pets in the level so they can do stuff
for(j = 0; j < array_length_1d(global.pets_in_current_level); j++)
{
    // Current Pets: dog, cat, bunny, snake, hedgehog
    // Related Sprites: spr_dog, spr_cat, spr_bunny, spr_snake, spr_hedgehog

    // Set up some local variables because otherwise things get messy and break
    local_pet_object = global.pet_objects[j]
    local_pet_step_direction_counter = global.pet_step_direction_counter[j]
    local_pet_step_amount = global.step_amount_of_pets[? local_pet_object.sprite_index]

    // The dog's movement
    if(global.pets_in_current_level[j] == spr_dog)
    {
        // Make 2 movements for the dog
        for(i = 0; i < 2; i++)
        {
            // Figure out where pets will end up after moving to avoid them phasing through walls
            x_distance_left_to_move = (global.movespeed_of_pets[?
local_pet_object.sprite_index])*local_pet_step_direction_counter[3]-local_pet_step_direction_counter[2]
            y_distance_left_to_move = (global.movespeed_of_pets[?
local_pet_object.sprite_index])*local_pet_step_direction_counter[1]-local_pet_step_direction_counter[0]

            // Find the distance between the x's and y's of the player and pet
            x_difference = local_pet_object.x + x_distance_left_to_move - obj_player.x
            y_difference = local_pet_object.y + y_distance_left_to_move - obj_player.y

            // Randomly generate a number that we use to decide if the pet moves or does not
            // Including x and y lets us bias towards whichever direction is larger
            // 1/the multiplier gives us the odds of a movement occurring
            movement_rng = random(1.5*(abs(x_difference)+abs(y_difference)))

            // Movement in the x direction
            if(movement_rng < abs(x_difference))
            {
                // Move if the pet won't move into a wall
                if(x_difference > 0 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move - global.tile_size, local_pet_object.y + y_distance_left_to_move) == 0))
                {
                    // Left
                    local_pet_step_direction_counter[2] += local_pet_step_amount
                }
            }
            // Move if the pet won't move into a wall
        }
    }
}
```

```

        else if(x_difference < 0 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move + global.tile_size, local_pet_object.y + y_distance_left_to_move) == 0))
        {
            // Right
            local_pet_step_direction_counter[3] += local_pet_step_amount
        }
    }
    // Movement in the y direction
    else if(movement_rng < abs(x_difference)+abs(y_difference))
    {
        // Move if the pet won't move into a wall
        if(y_difference > 0 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move, local_pet_object.y + y_distance_left_to_move - global.tile_size) == 0))
        {
            // Up
            local_pet_step_direction_counter[0] += local_pet_step_amount
        }
        // Move if the pet won't move into a wall
        else if(y_difference < 0 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move, local_pet_object.y + y_distance_left_to_move + global.tile_size) == 0))
        {
            // Down
            local_pet_step_direction_counter[1] += local_pet_step_amount
        }
    }
}
// Occasionally, the randomness will cause no movement at all

// Play a barking sound from the position of the dog
audio_play_sound_on(global.audio_emitters[j], woof, false, 1);
}
// The cat's movement
else if(global.pets_in_current_level[j] == spr_cat)
{
    // Make 1 movement for the cat
    for(i = 0; i < 1; i++)
    {
        // Figure out where pets will end up after moving to avoid them phasing through walls
        x_distance_left_to_move = (global.movespeed_of_pets[?
local_pet_object.sprite_index])*(local_pet_step_direction_counter[3]-local_pet_step_direction_counter[2])
        y_distance_left_to_move = (global.movespeed_of_pets[?
local_pet_object.sprite_index])*(local_pet_step_direction_counter[1]-local_pet_step_direction_counter[0])

        // Find the distance between the x's and y's of the player and pet
        x_difference = local_pet_object.x + x_distance_left_to_move - obj_player.x
        y_difference = local_pet_object.y + y_distance_left_to_move - obj_player.y

        // Randomly generate a number that we use to decide if the pet moves or does not
        // The cats randomly in all 4 directions with equal weight, and often doesn't move
        // 1/the multiplier gives us the odds of a movement occurring
        movement_rng = random(1.5*(4))

        // Movement in the x direction
        if(movement_rng < 2)
        {
            // Move if the pet won't move into a wall
            if(movement_rng < 1 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move - global.tile_size, local_pet_object.y + y_distance_left_to_move) == 0))
            {
                // Left
                local_pet_step_direction_counter[2] += local_pet_step_amount
            }
            // Move if the pet won't move into a wall
            else if(movement_rng < 2 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move + global.tile_size, local_pet_object.y + y_distance_left_to_move) == 0))
            {
                // Right

```

```

        local_pet_step_direction_counter[3] += local_pet_step_amount
    }
}
//Movement in the y direction
else if(movement_rng < 4)
{
    // Move if the pet won't move into a wall
    if(movement_rng < 3 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move, local_pet_object.y + y_distance_left_to_move - global.tile_size) == 0))
    {
        // Up
        local_pet_step_direction_counter[0] += local_pet_step_amount
    }
    // Move if the pet won't move into a wall
    else if(movement_rng < 4 and (tilemap_get_at_pixel(layer_tilemap_get_id("Walls"),
local_pet_object.x + x_distance_left_to_move, local_pet_object.y + y_distance_left_to_move + global.tile_size) == 0))
    {
        // Down
        local_pet_step_direction_counter[1] += local_pet_step_amount
    }
}
}
// Occasionally, the cat won't make any movements at all

// Play a meowing sound from the position of the cat
audio_play_sound_on(global.audio_emitters[j], cat, false, 1);
}

... {Code omitted here for the sake of brevity}

// Update the position counters of the pets so their movements can actually be made
global.pet_step_direction_counter[j] = local_pet_step_direction_counter
}
// Allow the player to move again after all the pets have finished moving
global.player_turn_counter = 3

```


Appendix B

UML Diagrams

As referenced in the coding approach section, the two figures below are UML state-chart and class-chart diagrams of the parts of *Pet Power Down*. Figure B-1 shows the UML class-chart diagram, showing the relations between menu buttons, selectors, player, and pets. Figure B-2 shows the UML state-chart diagram, shows the relations between transitioning between various screens and moments in the game,

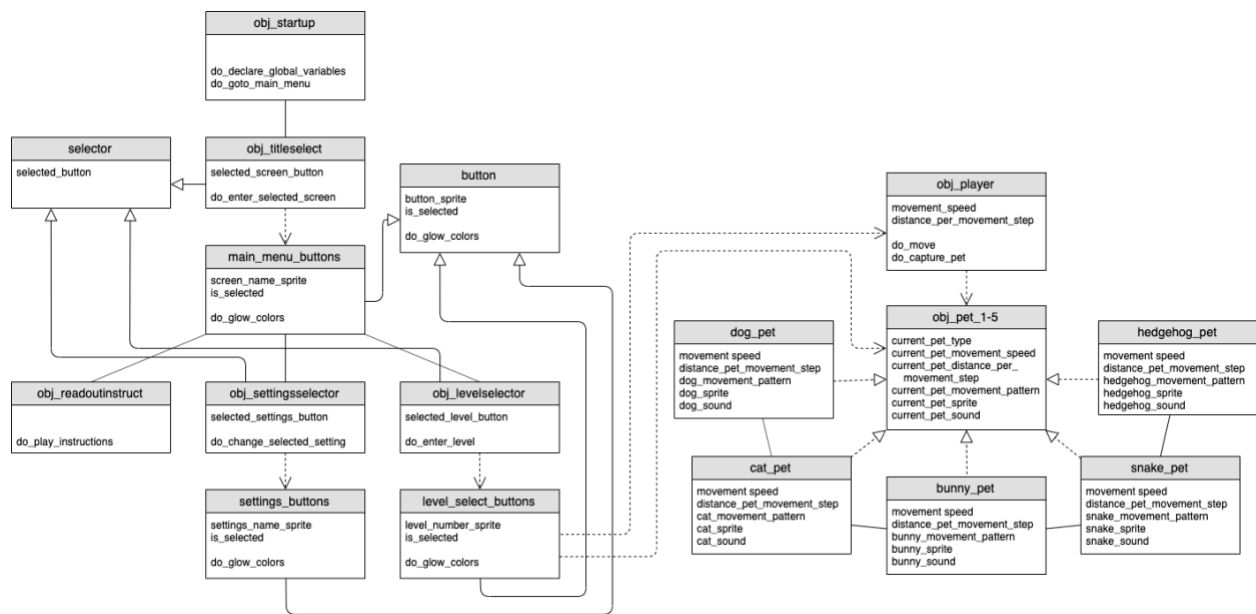


Figure B-1: Pet Power Down UML Class-Chart Diagram

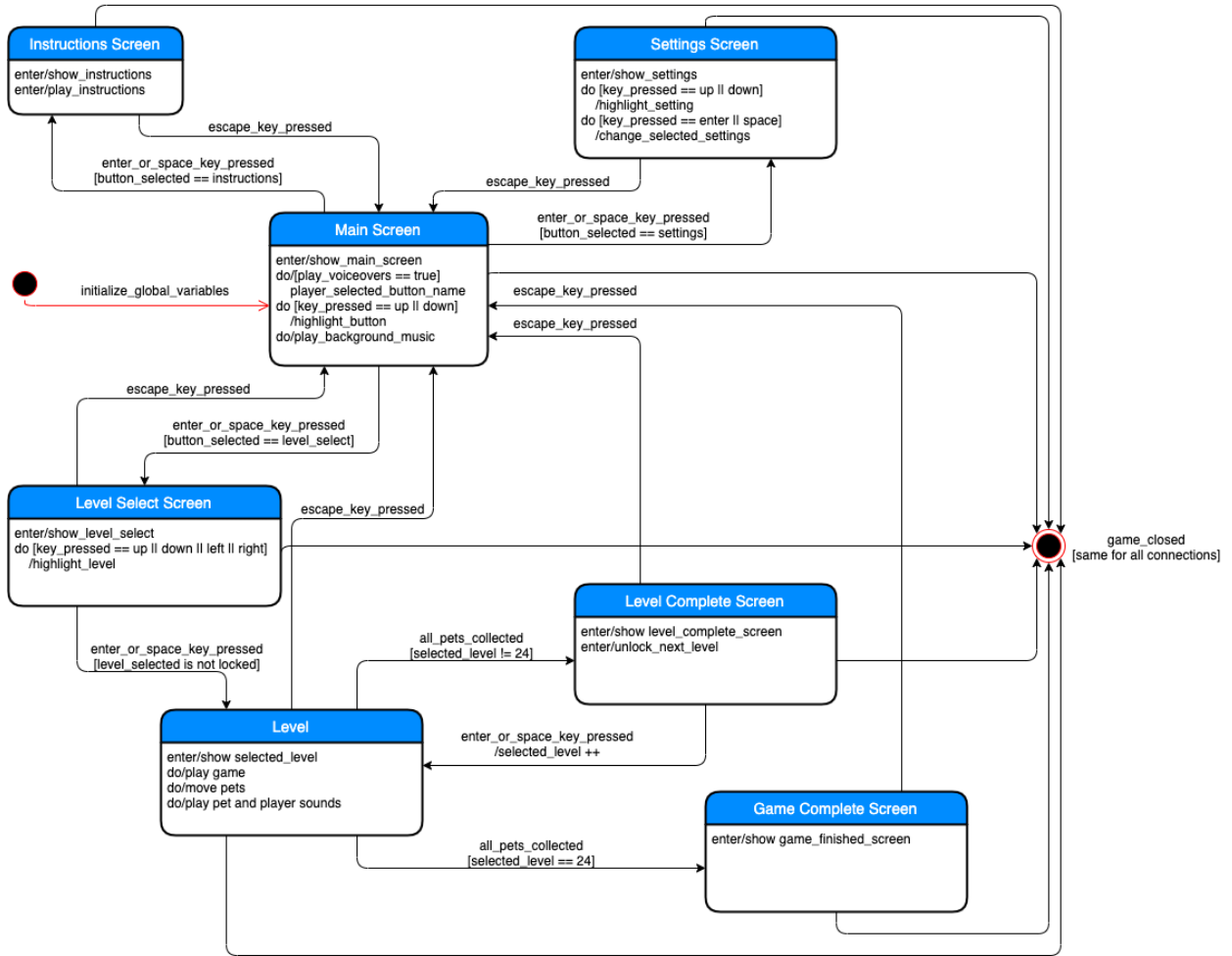


Figure B-2: Pet Power Down UML State-Chart Diagram

Appendix C

Official Release Video Poster

Linked [here](#) is our video promotion poster that accompanied our official release of *Pet Power Down*. It summarizes the game objectives and features as well as demonstrates some of the game play.