Day 4

Teams (Aliases):

- A: Alice and Luke
- B: John and Bob
- C: Katie and Scott and Martha

Pacman Previous Days' Instructions

1. CGCC Day 2: https://docs.google.com/document/d/15I1Iyj40Zl9Hk4wFv98oNpkEx6D7PsEfIlcRgfEh8r4/edit?usp=sharing
2. CGCC Day 3: https://docs.google.com/document/d/10GdXNLsxNCRCX_H4Ugw0zRshu9PshgqEwfH3HOs7T20/edit?ts=5f11c157

Resources:

- https://youtu.be/9bSX9Q5aP6E
- https://youtu.be/_sXUtLg7upA
- https://arcade.makecode.com/tutorials (most useful).

Steps for Pacman day 3:

1. Open link in arcade.makecode.com/beta
    a. Navigate to arcade.makecode.com/beta
    b. Click on 'Import' button on the right side of 'My Projects'.
    c. Click 'Import URL'.
    d. Paste the shared url and click 'Go ahead'.
    e. https://makecode.com/_5vwgEhf8bYVU
2. Update extension:
    a. Open the project: https://makecode.com/_0WvTV5RF4Cpi
    b. Click on the javascript button on top.
    c. Scroll down to abegel/pxt-turtlelogo.
    d. Click on the refresh button. The extension will update to version 1.0.2.
3. Update Clyde to fill out the drawing pane. (This is the first part of a workaround for a bug that we suspect to have been introduced to the makecode arcade in the past few weeks).
    a. Open edit sprite in all Clyde animations.
    b. Draw out Clyde to fill the drawing pane.

4. Set random velocity to Clyde when Clyde is stuck.
    a. In on game update with heading, check if both Clyde velocity vx and vy are 0.
    b. If true, then call function ‘clydeVelocity’.
    c. Pass (random(0 to 4))*90 as parameter to the function.
    d. https://makecode.com/_Wv8egUe0JTTc
5. Add collision between Pacman and ghost.
    a. Add one life to Pacman in on start.
    b. Create a new ‘on sprite kind of player overlaps otherSprite of kind player’ block.
    c. Change second player field to enemy.
    d. Change life by -1 in the block.
    e. Place Pacman and Clyde to starting position.
    f. Play a cool sound.
    g. https://makecode.com/_azX0k7LyALh0
6. Create better AI for the ghost.
    a. Turn not just at a collision with a wall, but at any new tile position.
    b. Explain how to check for turning only when entering a new tile position after turning previously, else you’ll spin in place.
    c. Find possible new directions to go in.
    d. Choose a random direction from that list.
    e. https://makecode.com/_2XPWr08AJXxR
7. If Pacman eats power pellet, he should be able to kill the ghost.
    a. Add a variable to the game to keep track of “scared ghost” mode. Set to false at the beginning of the game.
    b. Set to true in collision with power pellet.
    c. In collision with ghost block, add if statement to check for scared ghost mode and if true, ghost dies instead of pacman.
    d. Ghost goes back to ghost box, but Pacman gets points and continues on. 100 points.
    e. https://makecode.com/_597eLcVW2YCJ
8. Restore balance to game.
    a. Set a 30 second time limit for scared ghost mode.
    b. Create a countdown timer. At end, turn off scared ghost mode (goes back to avoid ghost mode).
    c. If Pacman eats a power pellet, turn on scared ghost mode and start the countdown timer at 30 seconds.
    d. We need to keep the power pellet sound going while power pellet advantage is on while the countdown is going.

    e. Introduce background music to indicate a game mode.
    f. If Pacman eats another power pellet, reset timer back to 30 seconds.
    g. https://makecode.com/_gxhMULPzc18R
9. Make it clear when you're in scared ghost mode.
    a. Create a scared ghost costume for the ghost sprite.
    b. Create a scared ghost animation with the scared ghost costume for floating.
    c. Set the ghost to the scared ghost costume and animation when you go into scared ghost mode and back to normal costume and floating animation when you finish scared ghost mode.
    d. https://makecode.com/_HXHTW10pJdRu

Team Introductions

- In this class, part of our goal is to teach you some skills for working in a distributed software team.
- Activity: Meet your Team
    - Conduct an interview with your Project Partner(s)
    - Each person chooses one person on the team to interview. No one should be interviewed more than once.
    - One person at a time, ask your assigned person the following questions. Listen for their responses before asking the next question.
        - Name
        - Intended major
        - Why did you apply to Clemson U?
        - What is your background with computers? What skills do you have?
        - What do you find most interesting about computers and how does this impact your college plans?
        - Who are the other members of your family? Which ones live with you? If some do not, where do they live?
        - What are your hobbies/interests/passions that are not related to this class?
        - Do you have any unique skills/tricks that you can show me via Zoom right now?
        - Who was your favorite teacher in high school? What did they teach? Why were they your favorite?
        - What was the last non-software-related book you read? Describe what it was about in just 2 sentences.

        - What was the best movie you saw in 2019. Explain why you chose that one in just 2 sentences.
- Activity: Work Schedule Negotiation
    - When working with someone who is remote, how do you like to work together?
        - How do you feel about chatting by text message?
        - How do you feel about chatting by audio call?
        - How do you feel about chatting by video call?
    - How do you manage your time when you get busy with a lot of tasks?
    - Have you worked on a team project before?
        - If yes,
            - How often did your team meet together?
            - Did your team have a leader? If yes, what did that leader do?
            - What was your role on the team?
            - How well did you get along with your teammates related to work, or related to non-work?
    - Exchange phone numbers with your project partner(s) in case your Internet goes out and you still want to work on the project together.
    - When can you work on the project together outside of class?
        - Negotiate times of day for every day this week. It's ok if your project partner cannot work outside of class. We will have a lot of time during class for you to work on your project.
    - Negotiate who will edit the code if you are working together online. Only one person should edit and save/commit the program while working together.
- Dissecting MakeCode Games
    - Go to http://arcade.makecode.com/beta, Select "Catch" and click "Start Tutorial"
        - Have the students pull up the game and play the game for 3 minutes
        - We play it for a second time and talk through it
        - Teach acceleration
    - Activity
        - On your own, select any MakeCode arcade game from http://arcade.makecode.com/beta and play with it for 5 minutes.
        - Working alone, go through the game code of the game you chose. Figure out how it works. Identify any blocks you haven't used before.

        - Meet with project partners and discuss the story, game logic, and mechanics of the game you chose.
        - Meet with project partners and walk them through the game code and explain how you think it works.
        - Report back one of your partner's chosen game's:
            - What is the story?
            - What is the game logic?
            - What are the mechanics?
        - Meet back as a single whole class. One student from each team (A, B, C) will have 5 minutes to explain the walk through their chosen game.
- Paper Prototyping
    - Prototyping with paper wireframes (Paige)
        - Basics (5 mins)
            - Definition of prototyping: Creating an initial prototype Reasons for prototyping: to (1) test and (2) to see if it meets the clients or users needs and desires. Sometimes we do not know what users or clients need or want by words themselves. Prototyping allows to get early and quick feedback. It helps the developer to understand what they actually should be developing by clarifying it with potential users. It also provides an opportunity to see if the functionality is both logical and user friendly. Is the product intuitive and easily usable? If not, how can we change it? How can we improve the initial design? Many projects go through multiple iterations of prototyping. If developer's skill the prototyping phase, that means that there could be (1) more bugs that could have
    - Tools (send supplies list July 1)
        - Paper
        - Graph paper
        - Colored pens and pencils
        - Index cards
        - Scissors and tape
        - Coins (can be faked by computer program)
        - Markers
        - Dice (fake by computer program)
    - UI/UX (https://www.youtube.com/watch?v=JMjozqJS44M 7.5 mins)

- Simple prototype activity (20 mins)
    - Activity:
        - Draw a music application with a black marker and paper (e.g. Apple Music or Spotify)
        - List all of the application's function (e.g. play music)
        - Take a picture of your application
        - Share the list with your partner
            - For every function that your partner mentioned, that you do not have, add it to your drawing.
            - Take a second picture of your application
            - Upload picture and share with the class
        - Prototype Competition. Whoever has the most unique features wins.
    - Talk about how too many features isn't always the best idea. More bugs can be introduced. So, how do we know what the right features are? How do we know if we have too many features?
- Game design paper prototype: https://www.youtube.com/watch?v=dt1bQsZ68iw (3 mins)
- Requirements: One important note is that you need to write out what the requirements are for the product that you are creating. By having that written out, you are more easily able to create a clear prototype and product. Thinking about what you are going to do before you do it is essential. (2 mins)
- Just like in the video, let's design a start screen for our Pacman game.
    - Create a list of the requirements of a start screen (5 mins)
        - Play Game
        - Save Progress
        - Load saved game
        - Settings
        - Help
    - Activity: (Think/Share)
        - Draw a start screen to support all these requirements.
        - Upload picture and share with the class.
- Prototype Pacman
    - Activity:
        - Draw the maze you drew for today's Pacman activity on big piece of paper. Draw in pellets in pencil.
        - Place start screen page on top of maze.

        - When player "clicks" on Play Game, remove the start screen page.
        - Now create a Pacman paper character and place him on the maze in his start position.
        - Create a Pacman controller that goes up/down/left/right.
        - Play Pacman.
        - As Pacman moves over a pellet, erase it from the maze.
        - Sing the Pacman movement music as Pacman goes through the game.
- Activity
    - Drawing a pretty maze with tilemap
    - Using preexisting tile map categories: Forest, Dungeon, etc.
    - Show them how to create Pacman's maze.
- Startup, Game Over, and Instruction Screens for Games
    - We have a start screen so that the game doesn't just immediately start. You need to start it yourself when you are ready.
    - Open Cat Jumper in MakeCode Arcade
    - Look at the Startup Screen
        - Title
        - Author
        - Multi-page.
    - Add instructions on how to teach people how to use PacMan.
    - Activity: Make a Game over screen for PacMan

Homework:

- Create ghost box for Pacman game
    - When Pacman kills the ghost, put the ghost back in the ghost box.
- Create your own rule or change to the Pacman game.
    - E.g. Give Pacman 3 lives.
- Draw a new maze for PacMan
    - Let's draw a new PacMan maze. Do this on paper. You can use another piece of paper as a ruler if you do not have one. Create your own maze, but make sure that *you do not have any dead ends*. Don't forget to leave a place for Pacman to start the game. Leave an empty spot somewhere else in case Pacman encounters any future enemies.
    - This might take multiple sheets of paper and thinking about how the maze works to get a working prototype. That is okay!

        - Program this new maze into your Pacman game tilemap before class tomorrow.
- Bonus points.
    - Create bonus points that can be collected by Pacman.
    - E.g. A fruit appears in the maze randomly. Pacman has 30 seconds to go collect the bonus. The bonus disappears if Pacman collects it or after 30 seconds.