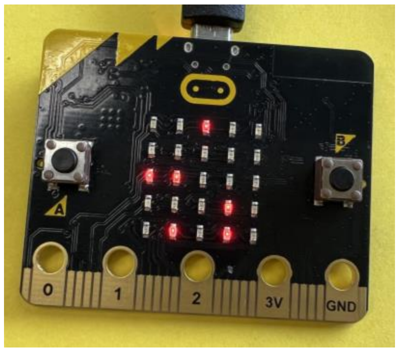
day96 micro:bit maze
Tuesday 5/10/22 (6th period) Wednesday 5/11/22 (7th period)

Today we are going to make a maze game.



Open the starter code file "maze starter file.py" attached to this assignment on the Google Classroom. Put your name into a comment at the top. Do a Save as (double click on the file name) and save the file with your name and "maze" in the title on the Desktop or in your Arduino folder on the computer.

Flash the code to make sure it works. It should display several solid lights and one that is blinking. Today we're making a maze game, the blinking light is the player, and the solid lights are the walls that you have to avoid to get around.

Step 1:

Add code to move up if you press the A button. Notice that the blinking light's position is controlled by the variables myr and myc (these stand for my row and my column). Use "if button_a.was_pressed():" to check for a press. **Pressing the A button should change the myr variable.** Remember, appropriate values for myr will be between 0 and 4 inclusive, so make sure you don't make the dot try to draw out of bounds, it will crash. 0 is to the far left column, 4 is the far right column.

Test your code by flashing it, then pressing the A button several times. Make sure the blinking dot goes up the left side of the screen and then stops at the top left. For now, don't worry that the dot goes through the solid light at column 0, row 2, we're fixing that in step 2.

Step 2:

Add a check that prevents you from moving up through a wall of the maze. It should just not move if you try to move up through a maze wall. The maze walls are the LEDs that are set to power 9. See the grid variable. You can "see" if an LED is lit by checking pic.get_pixel(myc, myr-1). If the value is 0, you can move there. If the value is 9, you cannot.

Test your code, make sure your dot goes from (0, 4) to (0, 3) and then no further up because the light at (0, 2) is lit up and thus is considered a "wall".

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Step 3:

Add code to move right if you press the B button. Also add code to prevent the user from moving right through a maze wall or off the screen to the right.

Step 4:

Add code to stop the game and put up a happy face for a long time (forever?) if you make it to location myr = 0, myc = 4 (the top right.)

Extensions:

Choose one of the following extensions. Everyone must do one (or a different one of your choice that you discuss with me):

1. If you press the A button down for more than 1 second the dot moves down instead of up, of course, only if the spot below the dot is legal. If you press the B button for more than a second the dot moves to the left, if legal. I used a while button_a.is_pressed(): loop inside the "if button_a.was_pressed():" if statement and the running_time() function to time how long the button was pressed.

2. Make the grid fill with 8 randomly placed wall parts instead of using a fixed grid (so the game is different every time. Make sure the spot at row 0 column 4 is not a wall dot, or you couldn't win.

3. Instead of using button A and button B use gestures and the accelerometer to move the dot. Don't move it through walls or off the edges, though, obviously.

4. Something else? If you've got a great idea, talk to me, I probably will encourage you to try it.

Call me over to check you off. Also, turn your code in to the Google Classroom when you are done.