



Name: _____

Assessment Speak Like a Machine

- 1) What is binary code?
 - a) A system of counting that uses only the numbers 1 and 2
 - b) A type of code used to write secret messages
 - c) A fundamental concept in computing that uses only 0s and 1s
 - d) A language that computers use to communicate with each other

- 2) Which of the following is 4 in binary counting?
 - a) 0001
 - b) 0100
 - c) 0010
 - d) 1000

- 3) What does the function scan buttons do in the code you wrote?
 - a) It scans for the correct button to start the program.
 - b) It detects which button (1 or 0) was pressed and calculates the binary number.
 - c) It scans the Pico board for errors.
 - d) It displays the final decimal number on the screen.

- 4) Why is it important to wait for the button to be released before continuing the loop?
 - a) To avoid counting the same button press multiple times
 - b) To give the program time to process the input
 - c) To prevent the Pico board from overheating
 - d) To reset the program before the next input

- 5) In the tutorial, why are the numbers 128, 64, 32, 16, 8, 4, 2, and 1 used in the create list with block?
 - a) They represent the sequence of button presses.
 - b) They are random numbers that help test the program.
 - c) They represent the place values in an 8-digit binary number.
 - d) They are the pin numbers used on the Pico board.

- 6) Describe a real-world application where binary code is used. Explain how understanding binary code might help you in this situation.



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Answer Key Speak Like a Machine

- 1) C - A fundamental concept in computing that uses only 0s and 1s
- 2) B - 0100
- 3) B - It detects which button (1 or 0) was pressed and calculates the binary number.
- 4) A - To avoid counting the same button press multiple times
- 5) C - They represent the place values in an 8-digit binary number.
- 6) *Example:* Computers and all digital devices use binary code. For example, binary code is used to make decisions, like turning left or right, when programming a robot to follow commands. Understanding binary code helps me understand how instructions are given to machines, which is useful when I want to create or troubleshoot a program.
- 7) *Example:* I would create a keypad with buttons representing 1 and 0. The system would require entering a specific 8-digit binary code to unlock the door. Each button press would add a binary digit to the code. The system then converts the binary code to a decimal number and compares it to the correct one. If they match, the door unlocks. This process uses binary to control access, just like in the tutorial.
- 8) *Example:* To change the code to read a 4-digit binary number, I would modify the list in the `scan_buttons` function to include only four values instead of eight. Here's the updated part of the code:

```
def scan_buttons():
    global number_value, i
    number_value = 0
    for i in [8, 4, 2, 1]: # Changed to 4 digits instead of 8
        while not (((not GP13.checkPin(Pull.UP)) or (not
GP14.checkPin(Pull.UP)))):
            pass
        if not GP13.checkPin(Pull.UP):
            number_value = isNumber(number_value) + i
            print('1', end="")
            while ((not GP13.checkPin(Pull.UP))):
                pass
        else:
            print('0', end="")
            while ((not GP14.checkPin(Pull.UP))):
                pass
```



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Explanation:

I changed the list from [128, 64, 32, 16, 8, 4, 2, 1] to [8, 4, 2, 1] because we only need four place values for a 4-digit binary number. This will allow the program to calculate and display a number between 0 and 15 instead of 0 and 255.