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Assessment

Walker Race

1) What does "Servo motor" refer to in the context of the tutorial?
    a) A device that controls the movement of Walker's legs
    b) A device that powers Walker's lights
    c) A device that measures the distance Walker travels

2) What is the name given to the creature built for the Mars Race for the Cause event?
    a) Fido
    b) Rover
    c) Walker
    d) Marsbot

3) Which of the following is NOT a part of Walker's hardware setup as described in the tutorial?
    a) FS90 Servo motors
    b) Wooden cutouts
    c) Screws
    d) Solar panels

4) How do you set up Walker's motors at the beginning of the code?
    a) By setting the angle to 90°
    b) By setting the angle to 45°
    c) By setting the angle to 180°
    d) By setting the angle to 60°

5) According to the tutorial, what combination of movements allows Walker to take a step forward?
    a) Front right foot forward, back right foot forward
    b) Front left foot forward, back left foot forward
    c) Front right foot forward, back left foot forward
    d) Front left foot forward, back right foot forward

6) Imagine your job is to improve Walker's performance in a race. Describe at least two modifications you could make to Walker's design or programming to help it move faster or more efficiently. Explain why these changes might help.

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7) The tutorial suggests using coins to change the friction of the rubber paws on the ground. How might adding weight to Walker influence its movement? Consider both positive and negative effects and provide a reasoned explanation for your answer.

8) The Python code below makes the servos on Walker move back and forth in a specific pattern. Can you analyze this code and make Walker's movements faster by reducing the waiting time between movements? Write down the new code with the updated wait times.

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Answer Key

Walker Race

1) B - A device that controls the movement of Walker's legs.

2) C - Walker

3) D - Solar panels

4) A - By setting the angle to 90°

5) C - Front right foot forward, back left foot forward

6) *Example:* One modification could be to reduce the wait times between steps, which might make Walker move faster. Another improvement could be to fine-tune the angles of the leg movements, ensuring each step is optimized for speed and balance. This could prevent Walker from stumbling and maintain a steady pace.

7) *Example:* Adding weight to Walker might increase friction, providing better grip and stability, which can benefit movement on slippery surfaces. However, too much weight could also slow Walker down or make it harder for the Servo motors to move the legs, potentially causing the motors to overheat or the legs to move less efficiently. The key is to find the right balance where the added weight improves traction without significantly hindering speed or agility.

8) Example:

```
## ---- Imports ---- ##
import time
import board
from piper_blockly import *

## ---- Definitions ---- ##

GP1 = piperServoPin(board.GP1, "GP1")

try:
  set_digital_view(True)
except:
  pass

GP0 = piperServoPin(board.GP0, "GP0")


## ---- Code ---- ##
```

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```
while True:
  GP1.setServoAngle(60)
  time.sleep(0.1)
  GP0.setServoAngle(120)
  time.sleep(0.1)
  GP1.setServoAngle(120)
  time.sleep(0.1)
  GP0.setServoAngle(60)

  time.sleep(0.1)
```

Explanation:
This change reduces the waiting time between each servo movement, making Walker's actions quicker.