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Assessment

Pose Detect

1) What is the purpose of the Pose Detect model in PAL?
    a) To enhance the ship's speed.
    b) To identify and track the position of body parts like eyes and elbows.
    c) To change the ship's color.
    d) To calculate the distance between stars.

2) What is the file called that contains the AI's memories and can be used by other AIs?
    a) Code
    b) Model
    c) Sensor
    d) Data Sheet

3) How does PAL use the information from the Pose Detect model to steer the ship?
    a) By reading temperature data
    b) By measuring the speed of the ship
    c) By using the position of the user's nose to control the LEDs
    d) By calculating the distance to other ships

4) What must happen to train the ship's steering model?
    a) Program the LEDs to blink in a specific pattern.
    b) Connect the ship to the internet for updates.
    c) Calibrate the ship's speed sensors.
    d) Collect three numbers representing different head positions and record them.

5) Why is it necessary to use the find closest block in the final code?
    a) To measure the ship's fuel level.
    b) To calculate the average speed of the ship.
    c) To compare the nose position with the numbers in the list and determine the nearest match.
    d) To display the current weather conditions.

6) Explain how the Pose Detect model and the LEDs interact to control the ship's direction. Give an example of how changing the head position affects the ship's movement.

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7) Discuss a real-world application where similar technology could be used outside ship control. How could AI models like Pose Detect be utilized in everyday life?

8) Look at the following Python code that controls the ship's direction based on the position of your nose. How would you modify the code to make the ship automatically stop and turn off all LEDs if the person ducks down lower? Write your modified code and explain how your changes work.

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Answer Key

Pose Detect

1) B - To identify and track the position of body parts like eyes and elbows.

2) B - Model

3) B - By using the position of the user's nose to control the LEDs.

4) B - To compare the nose position with the numbers in the list and determine the nearest match.

5) B - To compare the nose position with the numbers in the list and determine the nearest match.

6) *Example:* The Pose Detect model tracks the position of the user's nose using the camera. This position is converted into a number that corresponds to the direction the ship should steer. For example, if the nose position indicates a value of 1, the ship turns to port (left); if the value is 2, the ship goes straight; and if the value is 3, the ship turns to starboard (right). The LEDs represent these directions, and only the corresponding LED lights up to indicate the ship's current direction.

7) *Example:* AI models like Pose Detect could be used in various real-world applications, such as accessibility technology for people with disabilities. For instance, Pose Detect could control a computer or other devices through head movements for individuals who cannot use traditional input methods. In gaming, similar technology could create more immersive experiences by allowing players to control characters or actions using body movements. Additionally, Pose Detect could be used in security systems to identify and track individuals or in virtual reality (VR) applications to create more interactive and engaging environments.

8) Example:

```
# Original functions and setup...

## ---- Code ---- ##
position_list = [-42, 2, 51]
while True:
  if not GP12.checkPin(Pull.UP):
    webcam_read_poses()
    steering = find_closest_in_list((webcam_get_pose('nose', 'x')),
position_list, 80, numberValueCompare, False)
    if webcam_get_pose('nose', 'y') < -50:
      stop()  # The person's nose is below the middle of the camera's view
```

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```
    elif steering == 1:
      turn_to_port()
    elif steering == 2:
      turn_to_center()
    elif steering == 3:
      turn_to_starboard()
  else:
    stop()

  time.sleep(0.25)
```

Explanation:

In the modified code, a check is added to see if the webcam_get_pose('nose', 'y'), which is the person's nose's vertical position, is well below the center of the camera's field of view (lower than -50). If so, the stop() function is called to turn off all LEDs.