## Computer Science Level 1 - Python Course

Unit 7 Exam

1. Which of the following is the best description of what the Eye Sensor does?

    a. It reports the (X,Y) position of the VR Robot.

    b. It reports the distance between the VR Robot and the nearest solid object.

    c. It can be controlled to pick up and drop disks with metal cores.

    d. It detects if there is an object present and if so, the color of that object.
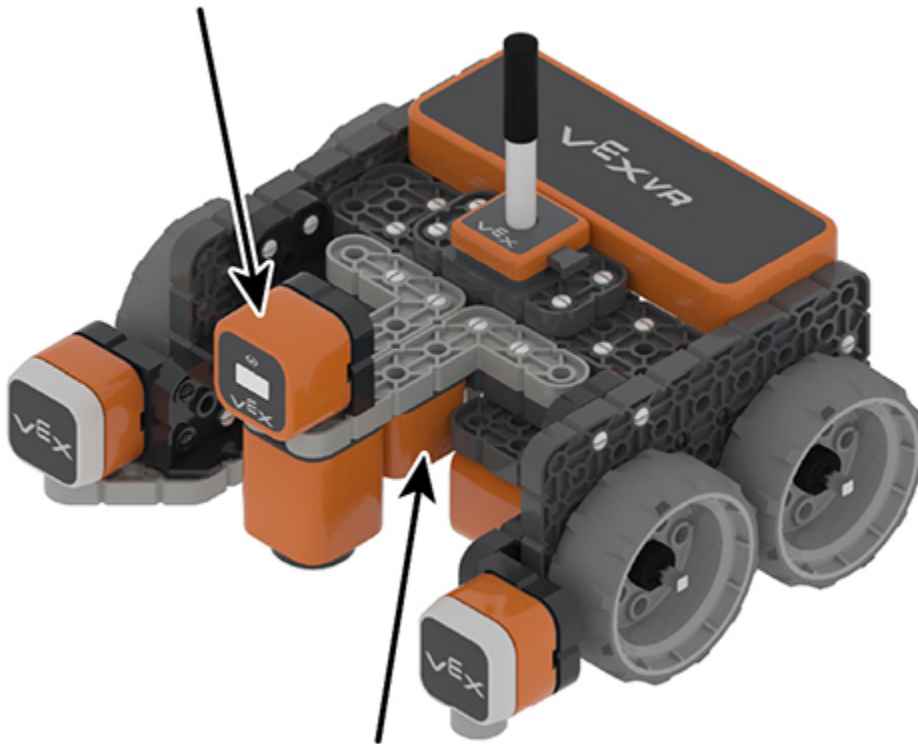
2. Which two sensors are being pointed to on the VR Robot?

    a. The Left and Right Bumper Sensors.

    b. The Front Eye and Down Eye Sensors.

    c. The Electromagnet and Location Sensors.

    d. The Distance and Front Eye Sensors.

3. What value will the *front_eye.near_object* command return when the Front Eye Sensor is close to an object that has detectable colors?

    a. It will report True.

    b. It will report False.

    c. It will report how far in millimeters (mm) or inches the Eye Sensor is from the object.

    d. It will report the location angle of the VR Robot in degrees.

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4. What value will the *down_eye.detect* command return when the Down Eye Sensor detects a different color than the one that was selected?

    a. It will report the time elapsed of the project in seconds.

    b. It will report the current heading in degrees of the VR Robot.

    c. It will report False.

    d. It will report True.

```python
def main():
    while not front_eye.detect(RED):
        drivetrain.drive(FORWARD)
        wait(5, MSEC)
    drivetrain.stop()
```

5. **What will happen when the Front Eye Sensor detects 'RED' in this project?**

a. The VR Robot will stop driving.

b. The VR Robot will turn left for 90 degrees.

c. The VR Robot will drive forward.

d. The VR Robot will check the Front Eye Sensor repeatedly for the color 'BLUE.'

```
def main():
    pen.move(DOWN)
    while True:
        if front_eye.detect(NONE):
            drivetrain.drive(FORWARD)

        if front_eye.detect(BLUE):
            pen.set_pen_color(BLUE)
            drivetrain.turn_for(LEFT, 90, DEGREES)

        if front_eye.detect(GREEN):
            pen.set_pen_color(GREEN)
            drivetrain.turn_for(RIGHT, 90, DEGREES)

        if front_eye.detect(RED):
            drivetrain.stop()

        wait(5, MSEC)

# VR threads — Do not delete
vr_thread(main)
```
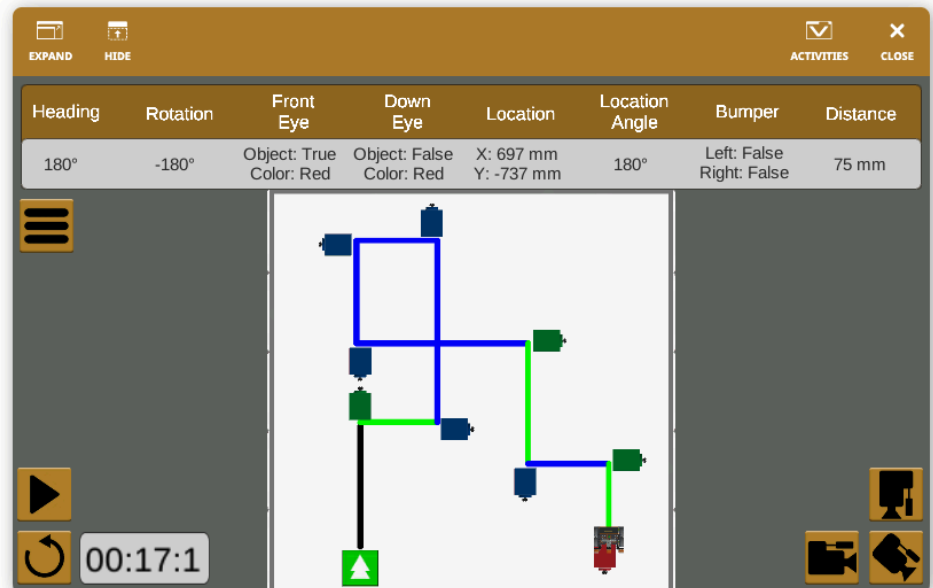
Heading	Rotation	Front Eye	Down Eye	Location	Location Angle	Bumper	Distance
180°	-180°	Object: True Color: Red	Object: False Color: Red	X: 697 mm Y: -737 mm	180°	Left: False Right: False	75 mm

00:17:1

6. What is the purpose of having multiple *if* statements in this project?

a. To have the Electromagnet Sensor pick up and place disks.

b. To be able to have the Down Eye Sensor check for the color 'RED.'

c. To have the Distance Sensor report how far the VR Robot is from an object.

d. To have the Front Eye Sensor check for each color and have the VR Robot perform a discrete behavior depending on the color detected.

```
def main():
    while True:
        if down_eye.detect(GREEN):
            drivetrain.drive(FORWARD)

        if down_eye.detect(RED):
            drivetrain.turn_for(RIGHT, 115, DEGREES)

        wait(5, MSEC)
```

7. In this project, if the condition of the Down Eye detecting 'RED' is True, how will the VR Robot move?

    a. It will turn right for 115 degrees.

    b. It will drive forward forever.

    c. It will turn left for 115 degrees.

    d. It will stop driving.

```
def main():
    while True:
        drivetrain.drive_for(FORWARD, 200, MM):
        drivetrain.turn_for(RIGHT, 90, DEGREES)
    wait(5, MSEC)
```

8. In this project, how many times will the Drivetrain commands be repeated?

    a. They will be repeated forever.

    b. They will repeat 100 times.

    c. They will repeat 5 times.

    d. They will repeat once.

```
def main()
    while True:
        if down_eye.near_object():
            drivetrain.drive(FORWARD)

        if front_eye.near_object():
            drivetrain.turn_for(RIGHT, 115, DEGREES)

        wait(5, MSEC)
```

9. **Which of the following best describes why an infinite *while* loop is used in this project?**

   a. To continuously check if the VR Robot pen is up or down.
   b. To continuously check if the VR Robot is near an object with detectable colors.
   c. To draw the color blue with the VR Robot pen.
   d. To report if the Bumper Sensors are being pressed.

```
def main():
    # If front eye detects green then turn right
    if front_eye.detect(GREEN):
        drivetrain.turn_for(RIGHT, 90, DEGREES)

    # If front eye detects blue then turn left
    if front_eye.detect(BLUE):
        drivetrain.turn_for(LEFT, 90, DEGREES)

    # If front eye detects red then stop driving
    if front_eye.detect(RED):
        drivetrain.stop()

    # If front eye detects none drive forward
    if front_eye.detect(NONE):
        drivetrain.drive(FORWARD)
```

10. **What condition will be checked next if the condition of the Front Eye Sensor detecting 'BLUE' is False?**

a. The condition of the Front Eye Sensor detecting 'GREEN' will be checked.

b. The condition of the Down Eye Sensor detecting 'RED' will be checked.

c. The condition of the Front Eye Sensor detecting 'NONE' will be checked.

d. The condition of the Front Eye Sensor detecting 'RED' will be checked.

```python
def main():
    while True:
        if down_eye.detect(GREEN):
            drivetrain.drive(FORWARD)


        if down_eye.detect(RED):
            drivetrain.turn_for(RIGHT, 115, DEGREES)


        wait(5, MSEC)
```

11. **Why are the *if* statements inside the infinite *while* loop for this project?**

    a. Conditions of the *if* statement will be checked continually if inside an infinite *while* loop. The VR Robot will use the Down Eye Sensor to continually check for 'RED' and 'GREEN.'

    b. The infinite *while* loop is not needed.

    c. If the infinite *while* loop was not used, the *if* statement would only be executed and checked twice.

    d. To turn right for 115 degrees when an object is detected.
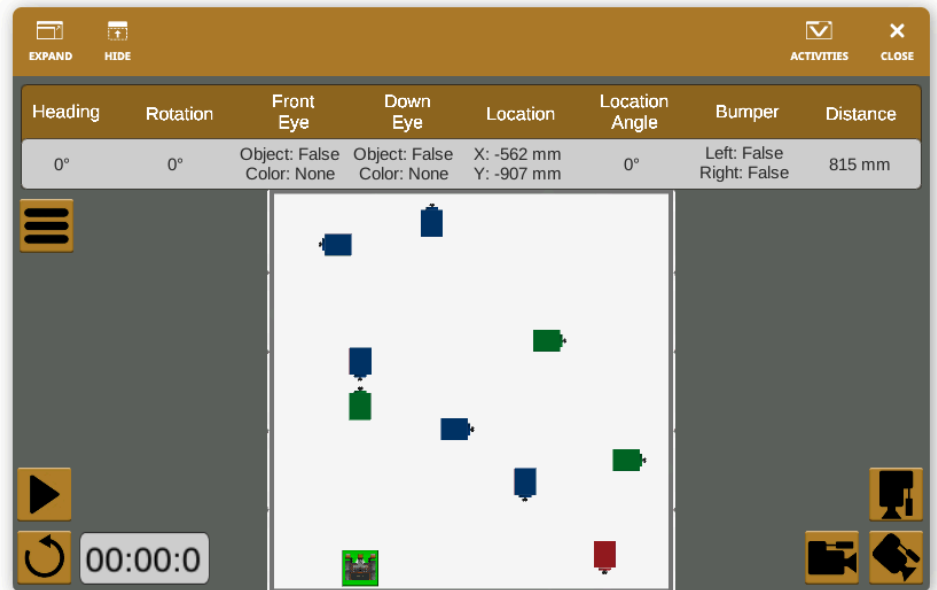
```
def main():
    while True:
        if front_eye.detect(NONE):
            drivetrain.drive(FORWARD)

        if front_eye.detect(BLUE):
            drivetrain.turn_for(LEFT, 90, DEGREES)

        if front_eye.detect(GREEN):
            drivetrain.turn_for(RIGHT, 90, DEGREES)

        wait(5, MSEC)

# VR threads — Do not delete
vr_thread(main)
```


Heading	Rotation	Front Eye	Down Eye	Location	Location Angle	Bumper	Distance
0°	0°	Object: False Color: None	Object: False Color: None	X: -562 mm Y: -907 mm	0°	Left: False Right: False	815 mm

12. **The goal of this challenge is to navigate the VR Robot through the Disk Maze and stop at the red disk. Which of the following should be added to this project in order to solve the Disk Maze challenge?**

a. If the Front Eye Sensor detects 'BLUE' then stop.

b. If the Down Eye Sensor detects three objects then stop.

c. If the Location Sensor detects an X coordinate of > 300mm then stop.

d. If the Front Eye Sensor detects 'RED' then stop.