Name Date

# Warmup

1. Suppose you want to watch Spongebob Squarepants on TV. Let the following expression represent the TV's logic.
   `NOT (state = "playing Spongebob Squarepants" OR result = "buffering")`

   Which of these expressions are logically equivalent?

   A. `state` $\neq$ `"playing Spongebob Squarepants" AND result` $\neq$ `"buffering"`

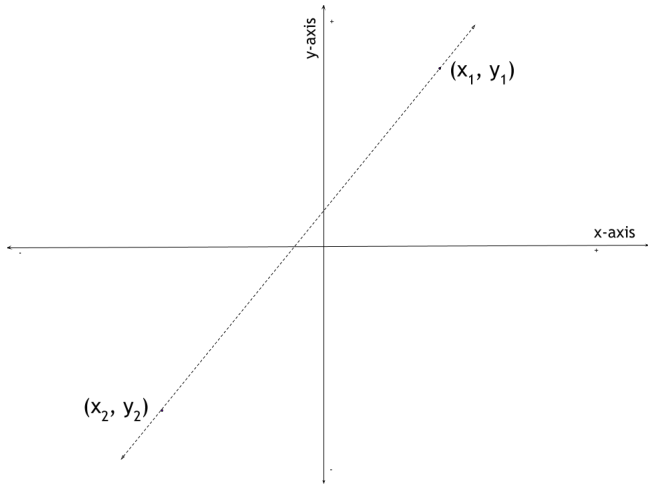
   B. `state` $\neq$ `"playing Spongebob Squarepants" OR result` $\neq$ `"buffering"`

   C. `state` $=$ `"playing Spongebob Squarepants" AND result` $=$ `"buffering"`

   D. `NOT (state` $=$ `"playing Spongebob Squarepants" AND result` $=$ `"buffering")`

# Exercises

1. Write a function that calculates the slope of a line given two points. We provide you with the function header below.
   *Note:* you do not need to use all the lines.




```
        # EXERCISE 1
        # Parameters: x1,y1,x2,y2 representing points (x1,y1) and (x2,y2) in a 2D plane
        # Returns the slope of the line defined by (x1,y1) and (x2,y2) as a float
        def calculateSlope(x1, y1, x2, y2):
            # YOUR CODE HERE
```

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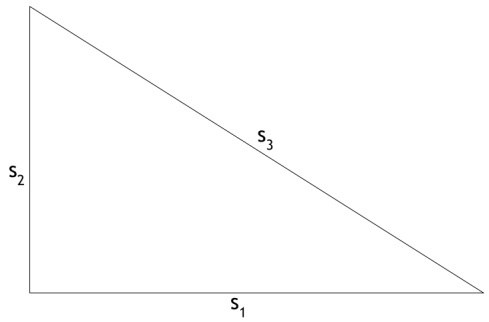
2. Write a function that returns true if a triangle is valid, and false otherwise. We provide you with the function header below.
*Note:* you do not need to use all the lines.




```
# EXERCISE 2
# Parameters: s1,s2,s3 representing the lengths of the sides of a triangle
# Returns True if the input triangle is valid, and False otherwise
def isValidTriangle(s1, s2, s3):
    # YOUR CODE HERE
```

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3. Write an XOR function, like the one we discussed in class. The tables below show how XOR works. Recall, 0 can represent False and 1 can represent True. The circle with the plus sign inside is another way of writing XOR. You can write this function the way we discussed in class, which you can see in the notes sheet. You can also try writing it with if statements. For a challenge, try writing it both ways. We provide you with the function header below.
   *Note:* you do not need to use all the lines.

| $x$ | $y$ | $x \oplus y$ |
|---|---|---|
| F | F | F |
| F | T | T |
| T | F | T |
| T | T | F |

| $x$ | $y$ | $x \oplus y$ |
|---|---|---|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

```
# EXERCISE 3
# Parameters: p, q representing the input boolean values to the XOR function
# Returns True if the XOR of p, q is True, False otherwise
def XOR(p, q):
    # YOUR CODE HERE
```

## Hours Spent on Assignment

Please fill out the following table. We will adjust future homework length and difficulty level accordingly.

| | |
|---|---|
| **HOURS SPENT** | |
| **DIFFICULTY LEVEL from 1 to 10**[1] | |

[1] 1 is super easy, 10 is extremely difficult