CSC104 - Homework #3
Due Date: due by 1pm, Thursday, February 22nd

This assignment is to be completed individually. If you receive outside help from your instructor or the B225 computer lab, note in the answer file the type of help you received and who helped you.

Objectives:

- To practice evaluating conditions.
- To practice tracing and writing if statements.

Submission:

- Type your answers to the below in Word and save it as a .pdf for submission. If you don't have Word you can use any software that allows you to save as a .pdf file.

QUESTION 1 – TRACE CONDITIONALS: 34 points

For each of the following if statements trace through the test cases given and determine the outcome. The outcome in your answer must be written *exactly* as it is written within the if statement.

a)
```
if age <= 10:
        print('receives a discount')
else:
        print('no discount')
```

age	outcome
80	
45	
3	
50	
10	

b)
```
if test1_grade < test2_grade and test1_grade < test3_grade:
        print('Improving')
else:
        print('Not improving')
```

test1_grade	test2_grade	test3_grade	outcome
60	70	80	
60	80	70	
70	60	80	
70	80	60	
80	60	70	
80	70	60	
70	70	80	

c) if (day = = 'Friday' or day = = 'Saturday') and time = = '10pm':
        print('time to go out')
    else:
        print('stay home')

day	time	outcome
Monday	10pm	
Monday	7pm	
Friday	7pm	
Saturday	10pm	
Friday	10am	

QUESTION 2 – WRITE CONDITIONALS: 25 points

Write if statements for each of the following. The if statements must contain the outcomes **exactly** as written below and they must be in the correct structure (see examples in question 1 above).

a) Print a little cold if the temperature is less than 60, nice weather otherwise.
b) Print $1 if the number of cents is a 100.
c) Print player wins if player earns at least 20 points, player loses otherwise.
d) Print 10% discount if total amount due is $100-$200 (including 100 and 200).
e) Print free for children 2 and younger or adults 65 and older; $5 otherwise.

QUESTION 3 – EVALUATE CONDITIONS: 22 points

Assume *num* has a value of 4 and *word* has a value of 'Fun'. Determine whether each of the following conditions evaluates to true or false. **Explain your answer on multiple lines and clearly indicate the final result**. **For example,**

3 > num and num > 2
3 > 4 and 4 > 2
F and T
Final Answer: FALSE

(4 < num or 5 > num) and word = = 'fun'
(4 < 3 or 5 > 4) and 'Fun' = = 'fun'
(F or T) and F
(T) and F
Final Answer: FALSE

Remember that computers are case sensitive which means that capital and lowercase letters are not the same. For example, capital Z is not the same as a lowercase z. The computer uses ASCII codes when comparing characters. Capital letters come before lower case letters in the ASCII table so "A" < "a" is true.

a) 2 < num and num < 6

b) 2 < num or num < 6

c) word = = 'Fun' or word = = 'fun'

d) (2 < num and num = = 6) or word = = 'fun'

e) (num = = 2 and num = = 7) or word = = 'Fun'

f) num = = 2 and (num = = 7 or word = = 'Fun')

g) num == 4 or num == 6 and word == 'fun'

h) (2 < num and num < 6) and (word = = 'Fun' or word = = 'fun')

QUESTION 4 – CARD GAME CONDITIONAL: 19 points

Imagine a card game on the computer where a player receives four cards and two of those cards have to be same (they have to form a pair) in order to win. The computer will randomly generate a number for each of the cards and store in memory the card value, not the suit.

Example 1: In the example below the player has a pair because card 1 and card 3 have the same value.

Computer's Memory	
Variable Name used to reference the location in memory	Value in Memory
card1	5
card2	9
card3	5
card4	8

Example 2: In the example below the player has a pair because card 1 and card 2 have the same value.

Computer's Memory	
Variable Name used to reference the location in memory	Value in Memory
card1	5
card2	5
card3	8
card4	9

You need to write an if statement that determines if the player has a pair or does not have a pair. Those are only two possible outcomes so only one if/else statement should be written.

This if statement will need to check multiple conditions and to write those conditions you need to know what combinations of cards could possibly form a pair. The two examples above demonstrate that card1-card3 and card1-card2 are two possible ways that a pair can exist. However there are more. Submit the following

a) 8 points: Create a list that contains all of the possible ways that a pair can exist which will be used for testing. We already came up with two. Include those and continue the list:

card1-card2
card1-card3
…

b) 11 points: An if statement that determines if the player has a pair or does not have a pair. Remember, there are only two possible outcomes so only one if/else statement should be written.

```
if _____________________________________________________:
        print('You have a pair')
else:
        print('You do not have a pair')
```

You need to figure out what goes in the _____ above. You will need multiple conditions and a logical operator in between the conditions. Use the list from a) to help you write the conditions. For example, in the list above we have card1-card2. The condition that would check if card1 is the same as card 2 is **card1 == card2**.

Save your file as a pdf for submission:

- Make sure your file is named *LastName*Hw3.pdf

Upload to Brightspace by Thursday, February 22nd @ 1pm:

- Go to **Homework/Programming Assignments** > **Homework #3**.
- **Upload** the file with your answers, ***LastName*Hw3.pdf**, **and *Submit*.**