CSCI 127: Joy and Beauty of Data
Snowmester 2020
Practice Midterm Exam

Print your name: _____

Print your Net ID: _____

By submitting this exam, I make the following truthful statements:

 • I have not received, I have not given, nor will I give or receive, any assistance to another student taking this exam, nor have I discussed this exam with past students of this course.
• I will not use any non-instructor approved materials to assist me on this exam.
• I will not plagiarize someone else's work and turn it in as my own.
• I understand that acts of academic dishonesty may be penalized to the full extent allowed by the Montana State University Student Code of Conduct, including receiving a failing grade for the exam and/or course. I recognize that I am responsible for understanding the provisions of the Montana State University Student Code of Conduct as they relate to this academic exercise.

Submission Instructions

This exam will be due to D2L by 11:59 PM on Friday, December 18th, 2020. This is a **hard** deadline. Late submissions will receive an automatic 0 for this exam..

The first four pages (**This page and question 1**) will be submitted to the appropriate D2L dropbox as a PDF
   • You may print out the exam, fill out the first four pages by hand, scan it/take a picture, and submit as a PDF.
   • Or you may fill out the first four pages virtually (i.e. in Word, PDF editor, etc) and save your answers as a PDF.

Problems 2, 3, and 4 will be submitted to a separate D2L dropbox. You will develop a python solution for each of those problems. You may have one single .py file for your all your answers, or you may have a separate .py file for each of those problems.

Make sure you name your files accordingly and place your name at the top of each of your .py file in a comment.

You may use notes, lecture slides, in class examples, previous labs/programs, the textbook, lecture recordings, and your computer on this exam.

You CAN NOT use search engines to access external resources (Youtube, Stack Overflow, W3Schools, etc), GroupMe, or other students (previous or current).

Be sure to attempt every problem. Even if you cannot fully solve one of the programming problems, you should try to get as much done as you can. I will give out as much partial credit as I can.

Read each question carefully and make sure that you answer everything asked for.

Question 1 (Multiple Choice) (20 pts)

1.1) Which of the following is **not** a Python operator?
   a. +
   b. //
   c. #
   d. %

1.2) Consider the following Python statements. What will be the value of a at the end of the program?

   a = 12 – 7
   a = a * 2
   a = a % 3

   a. 0
   b. 1
   c. 3
   d .33

1.3) What will be the output of the python program given below?

```
cities = ["Billings", "Bozeman", "Butte", "Missoula"]
cities.sort()
cities.reverse()
print(cities[1])
```

   a. Billings
   b. Bozeman
   c. Butte
   d. ["Billings, "Bozeman", "Butte", "Missoula"]

1.4) What will be the output of the python program given below?

```
s = "Joy and Beauty of Data"
print(s[3:-1])
```

   a. The program will not run due to an error
   b. y and Beauty of Dat
   c. and Beauty of Data
   d. and Beauty of Dat

1.5) The following code will produce an error. Why? (You can assume there are **no** indentation errors)

```python
def my_function(num1, num2, num3):
    print(num1, num2, num3)


my_function(22, 15, "Hello", 1.5)
```

a. Because the function doesn't return anything.
b. Because when the function is called, it passes the function too many input parameters/arguments.
c. Because when the function is called, it passes different data types (two different integers, a string, and a float).
d. All of the above are true

1.6) What will be the output of the python program given below? (You can assume there are **no** indentation errors)

```python
def my_function():
    for i in range(2):
        print("Hello")
    return 0
    print("World")


my_function()
```

a. Hello
    Hello
b. Hello
    World
c. Hello
    Hello
    World
d. The program will not run due to an error

1.7) True or False: Every function in Python will *always* return something
    a. True
    b. False

1.8) True or False: The following code will produce an error:

```
x = 7
if(x = 3 or x = 7):
    print("Hello there!")
```

    a. True
    b. False

1.9) Which of the following Python `range()` would produce the following list of numbers:

    [100, 90, 80, 70, 60, 50, 40, 30]

    a. range(100,20,10)
    b. range(100,20,-10)
    c. range(0,100,10)
    d. range(100, 30, -10)

1.10)   What will be the output of the python program given below?

```
food = ["Hamburger", "Hot Dog", "French Fry"]

food[2] = "Popcorn"

print(food)
```

    a. Popcorn
    b. French Fry
    c. ["Hamburger", "Hot Dog", "French Fry"]
    d. ["Hamburger", "Hot Dog", "Popcorn"]

Question 2 (20 pts)

Suppose you are your family are planning a trip to Disneyworld and want to calculate the total cost of the trip. A one way plane tickets cost $220 per person. You will be staying in a hotel, which costs $185 per night. Lastly, the price to get into Disneyworld is $100 per person. Also, one of your family members wants to buy a Disneyworld T-shirt, which costs $20.

Write a python function that will take in the number of family members going on the trip and how many nights the family will be staying. The function should calculate the total cost of the trip and return the total cost.

Hint: *Remember that you will need a plane ticket to get to Disneyworld and to return back home*

For example, if there are **4** family members and they are staying **3** nights in a hotel, the total cost should be **$2735**

```
# Your function will go above this comment. You should not modify anything below.

family_members = int(input("How many family members are going to Disneyworld? "))
nights = int(input("How many nights are you staying in the hotel? "))

answer = calculate_trip_cost(family_members, nights)
print("The total cost of the trip is $", answer)
```

Question 3 (25 pts)

In 2021, Summer will begin on June 20 and end on September 22.

Write a python program that will ask for a month and date from the user. Your Python should then determine if the date the user provided is in Summer or not.

You can assume that the user will always input a valid month (January – December) and a valid date for the month

Below are 3 different example outputs that may be produced:

Enter a month: July
Enter a date: 16
It is summer!

Enter a month: March
Enter a date: 2
It is not summer!

Enter a month: June
Enter a date: 19
It is not summer!

Question 4 (35 pts)

Consider a nested list that contains information about days running a lemonade stand. Each day contains the total revenue of that day and the total expenses for that day.

For example consider the following nested list: **[[31,10],[60,23], [42,12]]**

 $31 is the total revenue for day 1 and $10 is the total expenses for day 1. $60 is the total revenue for day 2, etc.

Write a function that will take in a nested list of this information and calculate the profit for each day and the total profit overall from the lemonade stand.

Given the following starting code:

```
# [[day1-revenue, day1-expenses], [day2-revenue, day2-expenses], etc]

days = [[31,10], [60,23], [42,12]]

calculate_profit(days)
```

Your function should produce the following output:

```
Day 1 profit: $21
Day 2 profit: $37
Day 3 profit: $30
Total Profit: $88
```

Note: Your function should work with any nested list of similar format, not just the given list