COSC 101, Exam #2
October 2018

Name: ____

Please write your name above. Do not start the exam until instructed to do so.

You have 50 minutes to complete this exam.

There are 6 questions and a total of 40 points available for this exam. Don't spend too much time on any one question.

Since indentation is important in Python, please be sure that your use of indentation is obvious for any code you write.

If you want partial credit, show as much of your work and thought process as possible.

If you run out of space for answering a question, you can continue your answer on one of the blank pages at the end of the exam. If you do so, be sure to indicate this in two places: (1) below the question, indicate which blank page contains your answer, and (2) on the blank page, indicate which question you are answering.

Question	Points	Score
1	7	
2	5	
3	4	
4	3	
5	10	
6	11	
Total:	40	

1. (7 points) Assume that the following statements have already been executed:

```
a = 10
b = ’October’
c = [4, 2, [3, 1]]
d = [a, b, 30]
```

For each of the following expressions, evaluate the expression and write the resulting value, or identify the error in the code that would prevent it from running.

(a) `b[-3]`

Solution:

```
’b’
```

(b) `d[0] + a`

Solution:

```
20
```

(c) `b[:2]`

Solution:

```
’Oc’
```

(d) `c[2][1]`

Solution:

```
1
```

(e) `len(c)`

Solution:

```
3
```

(f) `b[::2]`

Solution:

```
’Otbr’
```

(g) `d[1:2][4]`

Solution:

```
Error: list index out of range
```

2. (5 points) What is the output of the following program?

```
def mystery(a, b):
    c = ''
    d = 1000
    while len(a) > 0:
        e = b//d
        c += a[len(a):len(a)-e-1:-1]
        a = a[:len(a)-e]
        d = d//10
        print(">", b, d, e)
    return c

a = "Maze"
b = 2018
c = "Corn"
print(a, b, c, mystery(a, b))
```

Solution:

```
> 2018 100 2
> 2018 10 20
Maze 2018 Corn ezaM
```

3. (4 points) Rewrite the function below to use a while loop instead of a for loop. Your solution must have exactly one loop and no if statement. (In your solution, you need only to rewrite the part below the comment.)

```
def printListItems(alist):

    # rewrite function from here down...
    for i in range(0,len(alist)):
        if (i % 2 == 1):
            print(alist[i])
```

Solution:

```
i = 1
while i <= len(alist)-1:
    print(alist[i])
    i = i + 2
```

4. Consider the following python function:

```
def my_func(string1, string2, char):
    for i in string1:
        count = 0
        for j in range(len(string2)):
            if i == string2[j]:
                return j
            elif char == string2[j]:
                return -1
            elif char == i:
                count += 1
                if (count >= 2):
                    return -count
```

(a) (1 point) Consider the situation if `my_func` is called with `string1` equal to `"apples"` and `string2` equal to `"pumpkins"`. Identify one value that, if passed as the last parameter, `char`, would cause the value `0` to be returned from the function.

Solution: Any letter not in the string 'pumpkins'; except for letter 'a'.

(b) (1 point) Consider the situation if `my_func` is called with string1 equal to `"apples"` and string2 equal to `"squash"`. Identify one value that, if passed as the last parameter, `char`, would cause the value `-1` to be returned from the function.

Solution: The values s or q or u.

(c) (1 point) Consider the situation if `my_func` is called with string1 equal to `"apples"` and char equal to `"p"`. Identify one value that, if passed as the second parameter, `string2`, would cause the value `-2` to be returned from the function.

Solution: Any string without an 'a' or a 'p' in it that is of length 2 or greater.

5. (a) (5 points) Write a function called `getInputBetween` that takes a string `prompt`, an integer `low` and an integer `high`. The function should prompt the user for input using `prompt` until the user's input is between low and high, (inclusive). This function should give the user an appropriate error message if their input is invalid. You may assume that the user enters an integer.

Solution:

```
def getInputBetween(prompt, low, high):
    inp = int(input(prompt))
    while not (low <= inp <= high):
        print("Input must be between", low, "and", str(high) +
                    ". Try again.")
        inp = int(input(prompt))
    return inp
```

(b) (5 points) Write a function called findDiff that given a list of integers will return the difference between the maximum integer in the list and the minimum integer in the list. You may **NOT** use the built-in min or max functions.

Solution:

```
def findDiff(alist):
    maximum = -1
    minimum = 1000
    for i in alist:
        if i < minimum:
            minimum = i
        elif i > maximum:
            maximum = i
    return maximum - minimum
```

6. (11 points) For this problem, select one line of code from each of the pairs of lines of code below and reorder them to solve the following problem:

> Write a program that will compute and print the difference between the maximum and minimum of a user input group of ages, entered one at a time. You are required to use the `findDiff` and `getInputBetween` functions from question 5 part (a) and part (b) and can assume both functions works as described (regardless of whether your answer is correct or not).

```
A1          elif age != -1
A2          else:

B1      while more:
B2      while not more:

C1      age_list = []
C2      age_list = ''

D1              age_list += [age]
D2              age_list += age

E1          if age == -1:
E2          if age >= -1

F1              more = False
F2              more = -1

G1      return age_list
G2      print(age_list)

H1          age = get_input_between("Enter next age (-1 to stop): ", -1, 123)
H2          age = get_input_between(-1, 123)

I1  def get_ages:
I2  def get_ages():

J1      more = True
J2      more = 0

K1  findDiff(get_ages())
K2  print(findDiff(get_ages()))
```

Select only 11 lines of code from above, and only one line from each pair. You may fill in line identifiers (*e.g.*, E2) below, or write out the code.

Solution:

-

(This page is intentionally blank. Label any work with the corresponding problem number.)

(This page is intentionally blank. Label any work with the corresponding problem number.)