COSC 101, Exam #1
15 February 2017

Name: _____ Section: 9:55 / 1:20 / 2:45

Instructions and Advice:

- Do not open the exam until instructed to do so.

- Write your name and circle your section.

- You have 60 minutes to complete this exam, use your time wisely.

- There are 5 questions and a total of 50 points available for this exam. Don't spend too much time on any one question.

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

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

- If you run out of space while answering a question, you can continue your answer on one of the scrap 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 scrap page contains your answer, and (2) on the scrap page, indicate which question you are answering.

Question	Points	Score
1	8	
2	12	
3	8	
4	10	
5	12	
Total:	50	

1. (8 points) Assume that the following statements have already been executed:

```
month = 2
num = '3'
date = "15th"
snow = True
accum = 4.5
```

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) `accum / int(num)`

> **Solution:**
> ```
> 1.5
> ```

(b) `num + ''' on the ''' + date`

> **Solution:**
> ```
> '3 on the 15th'
> ```

(c) `float(num + num) // month`

> **Solution:**
> ```
> 16.0
> ```

(d) `date + month`

> **Solution:**
> ```
> Error: cannot concatenate 'str' and 'int' objects
> ```

(e) `not(snow)`

> **Solution:**
> ```
> False
> ```

(f) `int(accum) - int(month)`

> **Solution:**
> ```
> 2
> ```

(g) `int(num * 2) % 2`

> **Solution:**
>
> `1`

(h) `( len(date) < month or month ** month > accum ) and snow`

> **Solution:**
>
> `False`

2. (a) (4 points) What is the output of the following program?

```python
students = 28
desks = 100
professors = 5

if (students + professors) > desks:
    print ( "There are not enough desks!")
else:
    print ("There are enough desks for everyone to have their own.")
    leftover = desks - (students + professors)
    if leftover >= students:
        print ("There will be A LOT of empty desks.")
    elif leftover >= professors:
        print ("There will be exactly",leftover,"empty desks.")
    elif leftover >= 1:
        print ("There will be at least one empty desk.")
    else:
        print ("There will not be any empty desks." )
```

Solution:

```
There are enough desks for everyone to have their own.
There will be A LOT of empty desks.
```

(b) (4 points) What is the output of the following program?

```python
count = 3
a = " apples."
b = " bananas."
c = " cats."

for num in range(count):
    s = "You get "
    if num < 1:
        print ( s + str(num) + c)
    elif num % 2 == 0:
        print (s + "seventy" + a)
    else:
        print( s + str(count) + b )
```

Solution:

```
You get 0 cats.
You get 3 bananas.
You get seventy apples.
```

(c) (4 points) What is the output of the following program, if the user enters "cat" and "3"?

```python
word = input("Please enter a word: ")
copies = int(input("Please enter a whole number: "))

phrase = " * "

for count in range(copies):
    phrase = phrase + word + " * "
    print (phrase)
```

Solution:

```
* cat *
* cat * cat *
* cat * cat * cat *
```

3. (8 points) Write a program that asks the user for their name and then prints a special greeting
   for them. This special greeting will say hi to the user multiple times, depending on how long
   their name is. Also, the number of letter 'i's in the word 'hi' and '!'s at the end will increase
   for each additional line. Your program should match these examples:

```
What is your name? Bob
Hi Bob!
Hii Bob!!
Hiii Bob!!!

What is your name? Mary
Hi Mary!
Hii Mary!!
Hiii Mary!!!
Hiiii Mary!!!!
```

Solution:

```python
# get name from user
name = input("What is your name? ")

# for loop to print one line for each letter in name
for letter in range(len(name)):

    # compute number of 'i' and '!' to print
    count = letter + 1

    # print the line (using string copies)
    print( "H"+"i"*count+" "+name+"!"*count)
```

4. (10 points) You are working at a taco truck with a very simple menu:

```
[S]ingle taco    $2.50
[D]ouble taco    $4.50
[T]triple taco   $7.00
[B]everage       $2.00
```

You decide to write a program to calculate the total cost of each customer's order. Your program should first ask the user how many items they will be purchasing. Then the program will ask the user to order each item, by typing the first letter of each. Your program will compute and print the total price, including a 8% sales tax.

Your output must exactly match this example:

```
Number of items: 3
Item 1: S
Item 2: T
Item 3: B
The subtotal for your order is $11.5.
With tax, your total is $12.42.
```

Solution:

```python
# get the numer of items the user wants to order
num = int(input("Number of items: "))

# nitialize accumulator variable
total = 0.0

# loop to ask about each item ordered
for item in range(num):

    #get the user's order
    letter = input("Item "+str(item+1)+": ")

    #check which menu item it is and add price to total
    if letter == "S":
        total = total + 2.5
    elif letter == "D":
        total = total + 4.5
    elif letter == "T":
        total = total + 7
    elif letter == "B":
        total = total + 2


#print out subtotal
```

```python
print("The subtotal for your order is $"+str(total)+".")

#calculate total with tax and print
total = round(total*1.08,2)
print("With tax, your total is $"+str(total)+".")
```

5. (12 points) Write a program to calculate your best assignment in a points-based course. Your program should ask the user how many assignments have been completed. For each assignment, ask for the name of the assignment, the points that were available on that assignment, and the points the user received. Your program will then print out the name and percentage grade of the assignment on which the user earned the highest percent grade.

   Your output should exactly match the format of this example:

   ```
   How many assignments? 2

   Assignment Name: HW 1
   Total Points: 13
   Points Earned: 11

   Assignment Name: Exam 1
   Total Points: 100
   Points Earned: 80

   Best Assignment: HW 1 (84.62%)
   ```

   Note that the percentage grade is reported with at most two decimal places.

   Solution:

   ```python
   # get number of assignments from user
   num = int(input("How many assignments? "))

   # initialize variables
   top_grade = 0.0
   top_name = ""

   # ask user about each assignment
   for a in range(num):

       # get user input (with empty line before)
       print()
       a_name = input("Assignment Name: ")
       a_points = int(input("Total Points: "))
       a_score = float(input("Points Earned: "))

       # calculate grade and check if it's higher than previous highest
       a_grade = a_score / a_points
       if a_grade > top_grade:
           top_grade = a_grade
           top_name = a_name
   ```

```python
# print max assignment and score (with empty line before)
print()
print( "Best Assignment:", top_name, "(" + str(round(top_grade * 100, 2)) + "%)")
```

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