

COSC 101, Exam #1

February 2020

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 5 questions and a total of 50 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	8	
2	11	
3	9	
4	10	
5	12	
Total:	50	

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

```
a = "Valentine"  
b = '14'  
c = 2020  
d = 5.5  
e = True
```

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 + d`

Solution:

Error: can only concatenate str (not "float") to str

(b) `c - 10 * 2`

Solution:

2000

(c) `len(a) - d`

Solution:

3.5

(d) `"February " + b + ", " + str(c) + " is " + a + "'s Day"`

Solution:

"February 14, 2020 is Valentine's Day"

(e) `d + int(b)`

Solution:

19.5

(f) `d == 2.75 * 2`

Solution:

True

(g) `int((2 ** 3 / 2 + -d) / (int(b) - 13))`

Solution:

-1

(h) `c >= 5.5 or d <= len(b) and e`

Solution:

True

2. (a) (6 points) What is the output of the following program?

```
paradox = 23
people = 36

if people % 2 == 0:
    print("Two groups")
if people % 3 == 0:
    print("Three groups")
else:
    print("Other groups")
if people < paradox:
    print("No one has the same birthday")
else:
    print("Two people have the same birthday")
    pigeon = people - 366
    if (pigeon > 0):
        print("By the pigeon hole principle")
    elif (people >= 70):
        print("With 99.9% certainty")
    else:
        print("By the birthday paradox")
```

Solution:

```
Two groups
Three groups
Two people have the same birthday
By the birthday paradox
```

- (b) (5 points) What is printed by the following program if the user enters the following input?

Date: "January,25"

Zodiac: "Rat"

```
date = input('Date: ')
zodiac = input('Zodiac: ')

digits = ""
letters = ""
for char in date:
    if (char > '0' and char < '9'):
        digits = digits + char
    else:
        letters = letters + char
double = "20" * 2
print(digits, letters, double)
print("Year of the "+zodiac)
```

Solution:

25 January, 2020

Year of the Rat

Solution:

- F 2
- D 2
- A 1
- H 2
- I 2
- E 2
- B 1
- C 2
- G 1

4. (10 points) Write a cash register program that allows the user to enter the price of five items and displays the total price. Only positive prices should be included in the total. The output of your program must match this example:

```
What is the price of item #1? 1.33
What is the price of item #2? 2.67
What is the price of item #3? -5
What is the price of item #4? 11.11
What is the price of item #5? 99.01
```

```
The total cost is $114.12
```

Solution:

```
total = 0.0
for i in range(1,6):
    price = float(input("What is the price of item #" + str(i) + "? "))
    if price > 0 :
        total += price
print("\nThe total cost is $" + str(total))
```


5. (12 points) Write a program that accepts a sentence and
- counts the number of spaces, upper-case letters and lower-case letters
 - verifies if there is at least one even digit in the sentence
 - prints "OK" if there is at least one even digit, more than 1 and less than 4 spaces, and has more lowercase than upper case.
 - Prints "Not valid" otherwise

See the following input and output examples:

```
Input: Hi My name is Robo12 Output: Not valid!      (more than 3 spaces)
Input: Hi My name isRobo12 Output: OK
Input: Hi, My name isRobo2 Output: OK
Input: Hi, My name isRobo1 Output: Not valid!      (no even digit)
Input: Hi, My name isRobo Output: Not valid!      (no digit)
Input: Hi MY NAME IsRobo2 Output: Not valid!      (more upper than lower)
```

Solution:

```
msg=input('say something')

up=0
low=0
spaces=0
digits=False
for s in msg:
    if s.isupper():
        up+=1
    elif s.islower():
        low+=1
    elif s==' ':
        spaces+=1
    elif s.isdigit():
        digits= int(s)%2==0
if digits and 1<=spaces<=3 and up<low:
    print('OK')
else:
    print('Not valid!')
```

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