Python Homework 8

In the following multiple choice questions, please circle the correct output of Python code.

1.  ```
    count=0
    for i in range(0,4):
        for j in range(i,5):
            count=count+1
    print(count))
    ```
    (a) 10   (b) 12   (c) 14   (d) 16   (e) 18

2.  ```
    nums=[0,2,4,6,8,10]
    idx = [0,2,5]
    sum=0
    for i in range(0,len(idx)):
        sum=sum+nums[idx[i]]
    print(sum)
    ```
    (a) 10   (b) 12   (c) 14   (d) 16   (e) 18

3.  ```
    string1="abcdefg"
    idx=[3,1,5,2,4]
    string2=[]
    for i in range(0,len(idx)):
        string2.append(string1[idx[i]])
    print(string2)
    ```
    (a) dbfce   (b) caebd   (c) 31524   (d) abcdefg   (e) []

4.  ```
    num=1234
    while (num > 0):
        print(num%100)
        num=num//10
    ```
    (a) 34 23 12 1   (b) 4 3 2 1   (c) 34 23 12   (d) 12 34   (e) 12 23 34

5.  ```
    nums=[5,3,6,8,2,5,9,3,1]
    _____:
        print(nums[i])
    ```
    Output of the code is
    3 5 8 3
    What is the missing statement?
    (a) for i in range(0,len(nums),2):
    (b) for i in range(len(nums)-1,1,-3):
    (c) for i in range(len(nums),0,-2):
    (d) for i in range(len(nums)-1,0,-2):
    (e) for i in range(len(nums)-2,0,-2):

Coding question:

The question is from USACO:

Farmer John's cows have been holding a daily online gathering on the "mooZ" video meeting platform. For fun, they have invented a simple number game to play during the meeting to keep themselves entertained.

Elsie has three positive integers A, B, and C (A≤B≤C). These integers are supposed to be secret, so she will not directly reveal them to her sister Bessie. Instead, she gives Bessie seven (not necessarily distinct) integers, claiming that they are A, B, C, A+B, B+C, C+A, and A+B+C in some order.

Given a list of these seven numbers, please help Bessie determine A, B, and C. It can be shown that the answer is unique.

Question 1:

Make a function sort_nums(nums). Here nums is a list with 7 numbers with random order. Return value of the function should be a sorted list.

Test the function with sort_nums([2,2,11,4,9,7,9]), output should be [2,2,4,7,9,9,11].

Question 2:

Make a function abc(str1). Here str1 is a string with 7 numbers separated with spaces. There is no return value of the function, but you should solve the above USACO question and print out A,B,C inside the function.

Test the function with abc("2 2 11 4 9 7 9"), and the function should print out

2 2 7

Tip 1: To convert a string with 7 numbers into a list of 7 integers, you can use this code

list_str=str1.split()

nums=[]

for i in range(len(list_str)):

   nums.append(int(list_str[i]))

Tip 2: You can sort nums with the function you just made (sort_nums), or you can call Python function nums.sort() which will just sort nums.

Tip 3: Since A≤B≤C, for 7 numbers A, B, C, A+B, B+C, C+A, and A+B+C, the smallest one should be A, and second smallest should be B. To figure out C, it should be obvious that biggest value of 7 numbers should be A+B+C. So C should be biggest value minus A and B. So basic idea of the function is to first convert the string to a list of 7 integers, then sort it, then smallest and smallest values are A and B, and C is largest value minus A and B. Print your answer with print(A,B,C).

Question 3: If your above function abc(str1) is working fine, follow these steps to try to pass the question on USACO website.

Step 1: Delete all testing code and only keep the function(s). Add this line to the end of your source file:

```
abc(input())
```

Step 2: Go to this website and register a free USACO account:

http://www.usaco.org/index.php?page=register

You need an email to register. You may need help from your parents if you cannot figure out. You can reach out to me if your parents are also not able to figure out.

Step 3: After get the account, log in to the website, and go to

http://www.usaco.org/index.php?page=viewproblem2&cpid=1059

Step 4: Go to very bottom of the website, and select Python 3.6.9 as language, and click "Choose File" button and upload your source file, and click 'Submit' button.

Note: Other than print(A,B,C), you should not print out anything else.

If you see all 10 green signs, congratulation that you just passed very first USACO competition question!!!! If it is not working, try to figure out yourself, or you can reach out to me, or you can wait for next class.