

CS8 Final Exam – Practice Questions

READ EACH QUESTION CAREFULLY BEFORE ANSWERING. ANSWER THE QUESTION BEING ASKED OF YOU – NOTHING MORE AND NOTHING LESS!

Sometimes I'll ask you to explain your result, other times, I may not.

1. What is the exact output of this Python code? Look at the comment for a hint.

```
ucsb_classes = ['CS8', 'CS16', 'CS24', 'ECON1', 'COMM88',
                'MATH3A', 'CHEM6A']
l = []
# chr(65) = 'A'
for c in ucsb_classes:
    if c[0] == chr(67):
        l.append(c.center(6) + "!")
print(l)
```

2. What is the exact output of this Python code?

```
n = 2
while (n < 15):
    print("The number", n)
    n += 7
```

3. What is the exact output of this Python code?

```
i = 0
j = 15
while (i < 5) and (j > 10):
    for k in range(1, 10, 3):
        print("i = %d, j = %d, k = %d" % (i, j, k), end="---")
    i += 1
    j -= 5
```

4. What does this Python program print out?

```
def ThisThing(dnary):
    newd = {"original": 1}
    alist = (dnary.keys())
    for item in alist:
        newd[item + "***"] = dnary[item] + 1
    return newd
```

```
ThisOne = {"crepe": 3, "pho": 9, "tabbouli": 10, "roti": 9,
            "guotie": 5}
print( ThisThing(ThisOne) )
```

5. Write a **recursive** function in Python, **Series(n)**, where **n** is a positive integer.

Series(n) will *return* the n^{th} element of series S_n . The infinite series $S_n = 0, 1, 3, 7, 15, \dots$ etc..., for $n = 0, 1, 2, 3, 4, \dots$ etc..., so for example, **Series(3)** returns **7**. First figure out what the recursive formula is, i.e. how does S_n depend on S_{n-1} ? *Hint*: Try a linear relationship, i.e. $S_n = A.S_{n-1} + B$, where A and B are some constants.

6. Write a Python function, **Rest(str)**, that takes a string as input parameter and prints the string without its first letter. For example, **Rest("Hello")** would print **"ello"**, and **Rest("Scooby")** would print **"cooby"** (with all the letters printed on one line). You may NOT use **end=""** anywhere in your code.
7. Write a python function, **Alter(str)** that takes a string as a parameter and returns a string with alternating characters in the original string. For instance, if **s="abcd"**, then, **Alter(s)** becomes **"ac"**.
8. Write a python function, **change(L)** that takes a list (**L**) as a parameter and returns a list where the alternating list elements are changed to 2. Assume the list contains only integers. For instance, if **alist=[2,3,4,5]**, then, **change(alist)** returns **[2,2,4,2]**. If **alist=[1,1,1,1,1,1]**, then, **change(alist)** returns **[1,2,1,2,1,2]**.
9. What is the output of this code?

```
def Manipulate(s):
    x=""
    for i in range(len(s)):
        if i%2==0:
            x += s[i] + "C"
        else:
            x += "E" + s[i]
    return x

print(Manipulate("Jo"))
print(Manipulate(Manipulate("Jo")))
```

10. What does the instruction **print(CatchMe(3))** do, given the following function:

```
def CatchMe(IYC):
    if IYC==1:
        return 2
    else:
        return CatchMe(IYC-1)*IYC+1
```

11. What does the instruction **ForNWhile(3)** do, given the following function:

```
def ForNWhile(play):
    while (play<=3):
        for i in range(2):
            print("%d: first %d"%(play,i))
            play=play+2
        for j in range(2):
            print("%d: second %d"%(j,play))
            play=play+2
```

12. Write a Python function, **CollectNamesAges()**, that asks users to input names of people AND their ages that it will put in a dictionary *that it returns*. Users will be continually asked for names until they enter “END”.

For example:

```
Please enter a name: Jim
Please enter age for Jim: 30
Please enter a name: END
```

When they do so, the function will also print out a message that says:

“You have entered N names of people, whose average age is A ”

Where N is an integer number and A is a floating-point number with only 2 decimals showing after the point. The string “END” must not be placed in the dictionary and must not be counted towards the number N .

Answers: NOTE that it is very possible to have MORE than 1 version of a correct answer to most of these questions.

1. It prints out:

```
[' CS8  !', ' CS16 !', ' CS24 !', 'COMM88!', 'CHEM6A!']
```

to the standard output (i.e. computer display).

2. It prints out:

```
The number 2
```

```
The number 9
```

to the standard output (i.e. computer display).

3. It prints out:

```
i = 0, j = 15, k = 1---i = 0, j = 15, k = 4---i = 0, j = 15, k = 7---
```

to the standard output (i.e. computer display).

4. It prints out:

```
{'original': 1, 'crepe*': 4, 'pho*': 10, 'tabbouli*': 11, 'roti*': 10, 'guotie*': 6}
```

to the standard output (i.e. computer display).

5.

```
def Series(n):      # Figure out that A=2, B =1
```

```
    if n==1:      # Base Case
```

```
        return 1
```

```
    else:          # Recursion Case
```

```
        return(2*Series(n-1)+1)
```

6.

```
def Rest(astring):
```

```
    newstring = ""
```

```
    for j in range(1, astring):
```

```
        newstring = newstring + astring[j]
```

```
    print newstring
```

7.

```
def Alter(s):
```

```
    ns=''
```

```
    for i in range(len(s)):
```

```
        if i%2==0:
```

```
            ns += s[i]
```

```
    return ns
```

8.

```
def change(L):
```

```
    n1 = []
```

```
    for i in range(len(L)):
```

```
        if i%2==1:
```

```
            n1.append(2)
```

```
        else:
```

```
            n1.append(L[i])
```

```
    return n1
```

9. It prints out the string **'JCEo'**, then it prints out the string **'JCECECEo'** on the standard output (i.e. the computer display).
10. `print(CatchMe(3))` prints out the integer **16** on the standard output
11. It prints the following onto standard output (i.e. the computer display):
- ```
3: first 0
5: first 1
0: second 7
1: second 9
```
12. `def CollectNamesAges():`
- ```
    name = ""
    sum_age = 0
    count = 0
    D = {}

    name = input('Please enter a name: ')
    while name != 'END':
        age = int(input('Please enter age for %s: ' % name))
        sum_age += age
        count += 1
        D[name] = age
        name = input('Please enter a name: ')

    av_age = sum_age / count
    print('You have entered %d names of people, whose average
age is %.2f' % (count, av_age))

    return D
```