Functions and Methods Homework

Complete the following questions:

Write a function that computes the volume of a sphere given its radius.

volume = 4/3 pi r^3

In [1]:

```
def vol(rad):
    # code here
    import math as m
    return (4/3)*m.pi*(rad**3)
```

In [2]:

```
vol(5)
```

Out[2]:

```
523.5987755982989
```

Write a function that checks whether a number is in a given range (Inclusive of high and low)

In [3]:

```
def ran_check(num,low,high):
    # code here
    if num in range(low,high+1):
         print("{} is in range of {} & {} ".format(num,low,high))
    else:
        print("{} is not in range of {} & {} ".format(num,low,high))
```

In [4]:

```
ran_check(5,3,9)
```

```
5 is in range of 3 & 9
```

If you only wanted to return a boolean:

In [5]:

```
def ran_bool(num,low,high):
    # code here
    if num in range(low,high+1):
         print(True)
    else:
        print(False)
```

In [6]:

```
ran_bool(3,1,10)
```

```
True
```

Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.

```
Sample String : 'Hello Mr. Rogers, how are you this fine Tuesday?'
Expected Output :
No. of Upper case characters : 4
No. of Lower case Characters : 33
```

If you feel ambitious, explore the Collections module to solve this problem!

In [7]:

```
def up_low(s):
    # code here
    count = 0
    count1 = 0
    for i in s:
        if i.isupper():
            count += 1
    print("No. of Upper case characters : ",count)
    for i in s:
        if i.islower():
            count1 += 1
    print("No. of Lower case characters : ",count1)
```

In [8]:

```
up_low('Hello Mr. Rogers, how are you this fine Tuesday?')
```

```
No. of Upper case characters :  4
No. of Lower case characters :  33
```

Write a Python function that takes a list and returns a new list with unique elements of the first list.

```
Sample List : [1,1,1,1,2,2,3,3,3,3,4,5]
Unique List : [1, 2, 3, 4, 5]
```

In [9]:

```
def unique_list(l):
    # code here
    s = set(l)
    return list(s)
```

In [10]:

```
unique_list([1,1,1,1,2,2,3,3,3,3,4,5])
```

Out[10]:

```
[1, 2, 3, 4, 5]
```

Write a Python function to multiply all the numbers in a list.

```
Sample List : [1, 2, 3, -4]
Expected Output : -24
```

In [11]:

```
def multiply(numbers):
    # code here
    count = 1
    for i in numbers:
        count *= i
    print(count)
```

In [12]:

```
multiply([1,2,3,-4])
```

```
-24
```

Write a Python function that checks whether a passed string is palindrome or not.

Note: A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run.

In [13]:

```
def palindrome(s):
    # code here
    if s == s[::-1]:
        return True
    else:
        return False
```

In [14]:

```
palindrome('helleh')
```

Out[14]:

```
True
```

Given a number N.Find Sum of 1 to N Using Recursion

In [15]:

```
# CODE HERE
def a(n):
    if n <= 1:
        return n
    else:
        return (n + a(n-1))
a(n=int(input("Enter a number : ")))
```

```
Enter a number : 20
```

Out[15]:

```
210
```

Define a function which can generate and print a list where the values are square of numbers between 1 and 20

In [16]:

```
def printList(a):
    # CODE HERE
    l = []
    for i in range(1,a+1):
        l += [i**2]
    return l

printList(20)
```

Out[16]:

```
[1,
 4,
 9,
 16,
 25,
 36,
 49,
 64,
 81,
 100,
 121,
 144,
 169,
 196,
 225,
 256,
 289,
 324,
 361,
 400]
```

Define a function which can generate a dictionary where the keys are numbers between 1 and 20 (both included) and the values are square of keys. The function should just print the keys only.

In [17]:

```
def printDict(n):
    d = {}
    for i in range(1,n+1):
        d[i] = i**2
    return d.keys()
printDict(n = int(input("Enter a number : ")))
```

```
Enter a number : 10
```

Out[17]:

```
dict_keys([1, 2, 3, 4, 5, 6, 7, 8, 9, 10])
```

Write a function that count the no of characters of the given input text

- input
  - innomatics research labs

- output
  - innomatics :10
  - research : 8
  - labs : 4

In [18]:

```
def f1(a):
    b = a.split(' ')
    c = ''
    for i in b:
        print(i+':' ,len(i))
f1('innomatics research labs')
```

```
innomatics: 10
research: 8
labs: 4
```

Write a program which can map() to make a list whose elements are square of elements in [1,2,3,4,5,6,7,8,9,10].

Using map() function

In [19]:

```
# CODE HERE
# No different way of code is written as the requirment is specificly mentioned in problem

li = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
list(map(lambda x: x**2,li))
```

Out[19]:

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
```

Write a program which can map() and filter() to make a list whose elements are square of even number in [1,2,3,4,5,6,7,8,9,10].

using filter()

In [20]:

```
# CODE HERE
li = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
a = list(filter(lambda x:(x%2 ==0),li))
list(map(lambda x:x**2,a))
```

Out[20]:

```
[4, 16, 36, 64, 100]
```

using map()

In [21]:

```
li = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
list(map(lambda x: x**2, filter(lambda   x: x%2==0, li)))
```

Out[21]:

```
[4, 16, 36, 64, 100]
```

Write a program which can filter() to make a list whose elements are even number between 1 and 20 (both included)

In [22]:

```
# CODE HERE
def even(x):
     return list(filter(lambda x:x%2==0 ,x))
even(range(1,21))
```

Out[22]:

```
[2, 4, 6, 8, 10, 12, 14, 16, 18, 20]
```