

Started on	Friday, 28 February 2025, 2:44 PM
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Time taken	1 hour 59 mins
Grade	95.00 out of 100.00

Question 1

Complete

Mark 95.00 out of 100.00

1. Write a simple Python program to print the following on your computer screen.

```
*
***
*****
*
*
*
```

[5 points]

2. Write a program that will read G (the gravitational constant), M (mass of the earth), R (radius of the earth) and then it calculates g (the earth's acceleration due to gravity).
Hint: $G = 6.67408 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$, $M = 5.972 \times 10^{24} \text{ kg}$, $R = 6378 \text{ km}$.
Your program should print all input values and the output value using `print('f..')` format in Python.

[5 points]

3. Write a program which will read number of seconds. Then it will print in the format: hh-mm-ss. For example, if you read 1000, then it will print 1-46-40.

Hint: Use `//` (gives floor of x divided by y, e.g., $25//4 = 6$) and `%` (gives remainder of x divided by y, e.g. $25\%4$ gives 1). Note, both x and y should be integer values. Similarly, `x**y` return the value of x to the power y. A hint of the program is given above. However, you should try of your own!

[10 points]

4. When the following program runs, it produces -17.778, which is not correct. Why the following program does not produce correct results? Debug the program and then correct it.

```
# Establish some variables

degreesF, degreesC = 0, 0

# Define the relationship between F and C

degreesC = 5/9*(degreesF - 32)

# Prompt user for degrees F

degreesF = float(input('Enter the temperature in degrees F: '))

# Report the result

print(degreesF, "degrees F =", degreesC, 'degrees C')
```

[5 points]

5. Write a program which would read a string from the user. Then your program should convert it into all uppercase and lowercase strings and reverse the string. Also, print the substring from i-th to j-th letters. Read the value of i and j from the user.

[5 points]

6. Create two lists of random numbers. Then find the union, intersection and difference of the lists.

[5 points]

7. Write a program to compute and print the electric bill based on the following chart. Total number of Electric Units will be input by the user as a floating-point number.

First 100 KWH: Rs. 50/-

For next 100 units Rs. 0.75/unit

For next 100 units Rs. 1.20/unit

For 300 unit onwards Rs. 1.50/unit

An additional surcharge of 20% is added to the bill.

TEST CASE	INPUT	OUTPUT
1	150	Rs. 105.0
2	300	Rs. 294.0
3	1000	Rs. 1554.0
4	101	Rs. 60.9

[15 points]

8. Write a program, which will read three points (x_1, y_1) , (x_2, y_2) and (x_3, y_3) from the user. Then your program should print "Colinear" if the three points lie on the same line; otherwise print "Try with other points".

[10 points]

9. Read any positive number from the user. Add the number into a list, which is initially empty. Continue reading numbers from the user, add them into the last until user enter zero or any negative number. Print the smallest number, median and mean of the numbers in the list.

[10 points]

10. Define a function which would create a matrix of order $m \times n$ of random integer values. Write a program to print the matrix in m -rows and n -columns. You should read the values of m and n from the user. Create two matrices A of order $m \times n$ and B of order $n \times p$ and then print the matrix $C = A \times B$, where $A \times B$ denotes the multiplication of two matrices.

Hint: import random and then use random.random() or random.randint(a, b)

[10 points]

11. Write a program which will create a list of n random numbers. Scan the list to check which numbers are Fibonacci numbers.

[5 points]

12. Following is a piece of code written by a programmer. The code seems have a minor bug. Further the code is written without any proper comment. You have to inspect the code, fix the bugs and add comments so that the program should be written the way it has to be.

```
def foo(n:int):
    i=1
    j=1
    print(1, 1, end=',')
    for i in range(3,n+1):
        k = i + j
        print(k, end=',')
        i=j
        j=k
```

```
def fooSum(n:int) -> int:
    sum = 0
    i=1
    j=1
    if(n==1):
        sum = 1
    if(n==2):
        sum = sum + 1
    if(n>=3):
        for x in range(3,n+1):
            k = i+j
            sum = sum + k
            i=j
            j=k
    return sum
```

```
# Driver code
n= int(input('Enter the value of n: '))
foo
```

```
x= fooSum
print('\nThe sum of %d Foo series is %d' % (n,x))
```

[15 points]

```
def foo(n:int):
#this function printf first n fibonacci numbers
    if(n==0):
        return
    if(n==1):
        print("1");
        return
    i=1
    j=1
    print("1,1", end=',')
    for l in range(3,n+1):
        #foo(i) = foo(i-1)+foo(i-2)
        k = i + j
        print(k, end=',')
        #reassigning the previous two values to proceed further
        i=j
        j=k
```

```
def fooSum(n:int) -> int:
    #function to calculate the sum of first n foo values
    sum = 0
    i=1
    j=1
    if(n==1):
        sum = 1
    if(n==2):
        sum = 2
    if(n>=3):
        sum = 2
        for x in range(3,n+1):
            k = i+j
            # k =foo(x)
            sum = sum + k
            #incrementing sum by foo(x)
            i=j
            j=k
        return sum

# Driver code
n= int(input('Enter the value of n: '))
foo 🙋
x= fooSum 🙋
print('\nThe sum of %d Foo series is %d' % (n,x))
📄 A5-23CS30048.ipynb
```

Comment:

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