Programming Laboratory-I

Assignment No-9

(Python loops and selection statements)

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1. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program in python to find the total number of illiterate men and women if the population of the town is 80,000.
   Program:

```
Assignment_9 >  1.py > ...
    1    # 1.    In a town, the percentage of men is 52.
    2    #  The percentage of total literacy is 48. If total percentage of literate men
    3    # is 35 of the total population, write a program in python to find the total number
    4    # of illiterate men and women if the population of the town is 80,000.
    5
    6    men=52
    7    women=100-52
    8    menl=35
    9    womenl=48-35
   10    population=80000
   11
   12    totalmen=(men*population)/100
   13    totalwomen=(women*population)/100
   14
   15    totalLM=(totalmen*menl)/100
   16    totalLW=(totalwomen*womenl)/100
   17
   18    print("The Total Men Illiterate in 80000 is equal to : ",int(totalmen-totalLM))
   19    print("The Total Women Illiterate in 80000 is equal to : ",int(totalwomen-totalLW))
   20
```

OUTPUT:
The Total Men Illiterate in 80000 is equal to : 27040
The Total Women Illiterate in 80000 is equal to : 33408

2. A cashier has currency notes of denominations 10, 50 and 100. If the amount to be withdrawn is input through the keyboard in hundreds, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer.

Program:

```
3
4    n=int(input("Enter the Amount to withdraw : "))
5    hundred=0
6    fifty=0
7    ten=0
8    if(n>=100):
9        hundred+=int(n/100)
10       n=(n%100)
11
12   if(n>=50):
13       fifty+=int(n/50)
14       n=n%50
15
16   if(n>=10):
17       ten+=int(n/10)
18       n=n%10
19   print("The number of Hundred Rupees Note Required is : ",hundred)
20   print("The number of Fifty Rupees Note Required is : ",fifty)
21   print("The number of Ten Rupees Note Required is : ",ten)
```

OUTPUT:
Enter the Amount to withdraw : 580
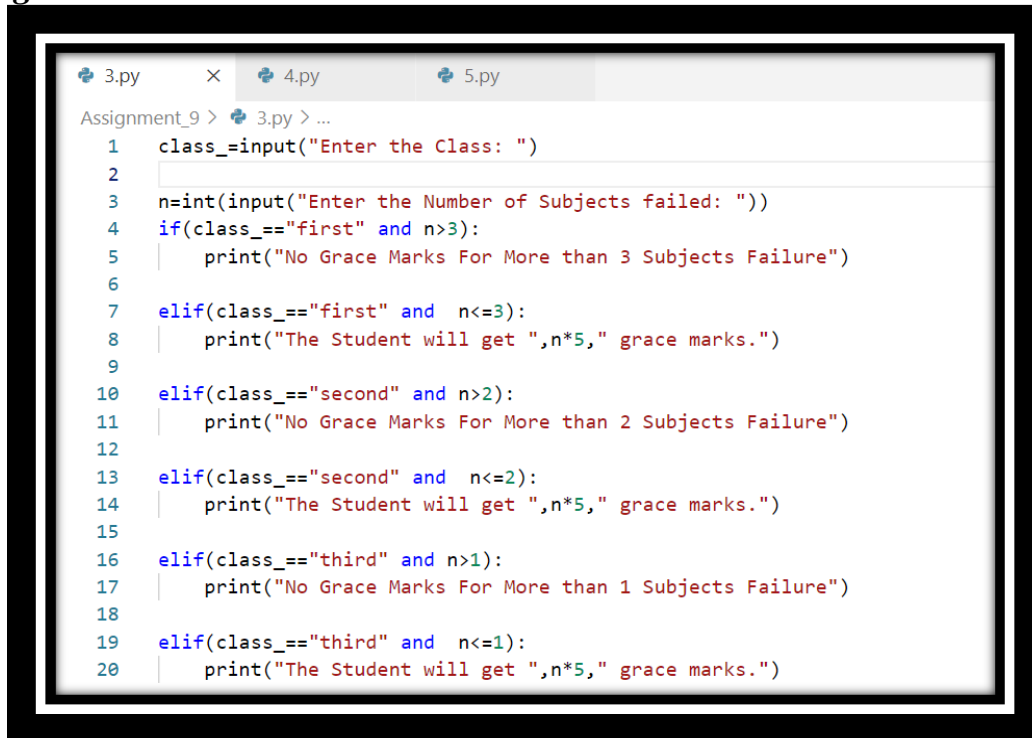The number of Hundred Rupees Note Required is : 5
The number of Fifty Rupees Note Required is : 1
The number of Ten Rupees Note Required is : 3

3. Write a program which to find the grace marks for a student. The user should enter the class obtained by the student and the number of subjects he has failed in.
   a) If the student gets first class and the number of subjects he failed in is greater than 3, then he does not get any grace.
   b) If the number of subjects he failed in is less than or equal to 3 then the grace is of 5 marks per subject.

c) If the student gets second class and the number of subjects he failed in is greater than 2, then he does not get any grace.
d) If the number of subjects he failed in is less than or equal to 2 then the grace is of 4 marks per subject.
e) If the student gets third class and the number of subjects he failed in is greater than 1, then he does not get any grace.
f) If the number of subjects he failed in is equal to 1 then the grace is of 5 marks per subject.

Program:

```
3.py    ×    4.py         5.py
Assignment_9 >    3.py > ...
1    class_=input("Enter the Class: ")
2
3    n=int(input("Enter the Number of Subjects failed: "))
4    if(class_=="first" and n>3):
5        print("No Grace Marks For More than 3 Subjects Failure")
6
7    elif(class_=="first" and  n<=3):
8        print("The Student will get ",n*5," grace marks.")
9
10   elif(class_=="second" and n>2):
11       print("No Grace Marks For More than 2 Subjects Failure")
12
13   elif(class_=="second" and  n<=2):
14       print("The Student will get ",n*5," grace marks.")
15
16   elif(class_=="third" and n>1):
17       print("No Grace Marks For More than 1 Subjects Failure")
18
19   elif(class_=="third" and  n<=1):
20       print("The Student will get ",n*5," grace marks.")
```

OUTPUT:

Enter the Class: second
Enter the Number of Subjects failed: 2
The Student will get 10 grace marks.

4. Write a program in python for matrix multiplication.

Program:

```
Assignment_9 >   4.py > ...
    1    # 4.    Write a program in python for matrix multiplication.
    2    A = [[12, 7, 3],
    3         [4, 5, 6],
    4         [7, 8, 9]]
    5
    6    B = [[5, 8, 1, 2],
    7         [6, 7, 3, 0],
    8         [4, 5, 9, 1]]
    9
   10    result = [[0, 0, 0, 0],
   11              [0, 0, 0, 0],
   12              [0, 0, 0, 0]]
   13
   14    for i in range(len(A)):
   15        for j in range(len(B[0])):
   16            for k in range(len(B)):
   17                result[i][j] += A[i][k] * B[k][j]
   18
   19    for r in result:
   20        print(r)
   21
```

OUTPUT:
[114, 160, 60, 27]
[74, 97, 73, 14]
[119, 157, 112, 23]

5. Write a loop that counts the number of space characters in a string. Recall that the space character is represented as ' '.

Program:

```
 5.py     X
Assignment_9 >   5.py > ...
    1    # 5.    Write a loop that counts the number of space characters in a string.
    2    # Recall that the space character is represented as ' '.
    3
    4    st=input("Enter the String: ")
    5    ct=int(0)
    6    for a in st:
    7        if(a==' '):
    8            ct+=1
    9    print(st)
   10    print("The Number of Count of Space Character in a Given String is : ",ct)
```

6. A local biologist needs a program to predict population growth. The inputs would be the initial number of organisms, the rate of growth (a real number greater than 0), the number of hours it takes to achieve this rate, and a number of hours during which the population grows. For example, one might start with a population of 500 organisms, a growth rate of 2, and a growth period to achieve this rate of 6 hours. Assuming that none of the organisms die, this would imply that this population would double in size every 6 hours. Thus, after allowing 6 hours for growth, we would have 1000 organisms, and after 12 hours, we would have 2000 organisms. Write a program that takes these inputs and displays a prediction of the total population.

Program:

```
Assignment_9 >  6.py > ...
1    no_organism=int(input("Enter the initial no of organism: "))
2    rate=int(input("Enter the rate of Growth: "))
3    hours=int(input("Enter the number of Hours it takes to achieve this: "))
4    h2=int(input("Enter the total hours of Growth: "))
5
6    Growth=no_organism *int(pow(rate,h2/hours))
7    print("The total growth achieved is : ",Growth)
```

OUTPUT:

Enter the initial no of organism: 500
Enter the rate of Growth: 2
Enter the number of Hours it takes to achieve this: 6
Enter the total hours of Growth: 12
The total growth achieved is : 2000

7. Write a python program to print following pattern as output.

Program:

```
7.py        ×

Assignment_9 >  7.py > ...
1   # 7.    Write a python program to print following pattern as output.
2   # ----------------------------------------------------------------------
3   # a)Pattern
4   rows = int(input("Enter the number of rows: "))
5   k = 2 * rows - 2
6   for i in range(0, rows):
7       for j in range(0, k):
8           print(end=" ")
9       k = k - 2
10      for j in range(0, i + 1):
11          print("* ", end="")
12      print("")
13
14  # ----------------------------------------------------------------------
15
16  # b)Pattern
17  rows = int(input("Enter the number of rows: "))
18  k = 2 * rows - 2
19  for i in range(rows, -1, -1):
20      for j in range(k, 0, -1):
21          print(end=" ")
```

```python
27    # -----------------------------------------------------------
28    # c)Pattern
29    rows = int(input("Enter the number of rows: "))
30    k = 2 * rows - 2
31    for i in range(0, rows):
32        for j in range(0, k):
33            print(end=" ")
34        k = k - 1
35        for j in range(0, i + 1):
36            print("* ", end="")
37        print("")
38
39
40    k = rows - 2
41    for i in range(rows, -1, -1):
42        for j in range(k, 0, -1):
43            print(end=" ")
44
45        k = k + 1
46        for j in range(0, i + 1):
47            print("* ", end="")
```

```python
49
50    # -----------------------------------------------------------
51    # e)Pattern
52    n = int(input("Enter the number of rows: "))
53
54    for i in range(0, n):
55        for j in range(0, i + 1):
56            print("* ", end="")
57        print()
58
59    # -----------------------------------------------------------
60    # f)Pattern
61    rows = int(input("Enter the number of rows: "))
62
63    for i in range(rows + 1, 0, -1):
64        for j in range(0, i - 1):
65            print("*", end=' ')
66        print(" ")
67
```

```python
69    # g)Pattern
70    n=int(input("Enter the number of rows: "))
71
72    def pypart2(n):
73
74        k = 2*n - 2
75        for i in range(0, n):
76            for j in range(0, k):
77                print(end=" ")
78            k = k - 2
79            for j in range(0, i+1):
80                print("* ", end="")
81            print("\r")
82
83    pypart2(n)
84
85    # ------------------------------------------------------------
86    # h)Pattern
87    rows = int(input("Enter the number of rows: "))
88    i = rows
```

```
83    pypart2(n)
84
85    # ------------------------------------------------------------------------
86    # h)Pattern
87    rows = int(input("Enter the number of rows: "))
88    i = rows
89    while i >= 1:
90        j = rows
91        while j > i:
92            # display space
93            print(' ', end=' ')
94            j -= 1
95        k = 1
96        while k <= i:
97            print('*', end=' ')
98            k += 1
99        print()
100       i -= 1
101
```

```
102   # -------------------------------------------------------------------
103   # i)Pattern
104   rows = int(input("Enter the number of rows: "))
105   i = 1
106   while i <= rows:
107       j = rows
108       while j > i:
109
110           print(' ', end=' ')
111           j -= 1
112       print('*', end=' ')
113       k = 1
114       while k < 2 * (i - 1):
115           print(' ', end=' ')
116           k += 1
117       if i == 1:
118           print()
119       else:
120           print('*')
121       i += 1
```

```
Assignment_9 >  7.py > ...
122
123    i = rows - 1
124    while i >= 1:
125        j = rows
126        while j > i:
127            print(' ', end=' ')
128            j -= 1
129        print('*', end=' ')
130        k = 1
131        while k <= 2 * (i - 1):
132            print(' ', end=' ')
133            k += 1
134        if i == 1:
135            print()
136        else:
137            print('*')
138        i -= 1
```

Output:

a)   b)   c)   d)

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

e)   f)   g)   h)   i)