Lab Assignment-1

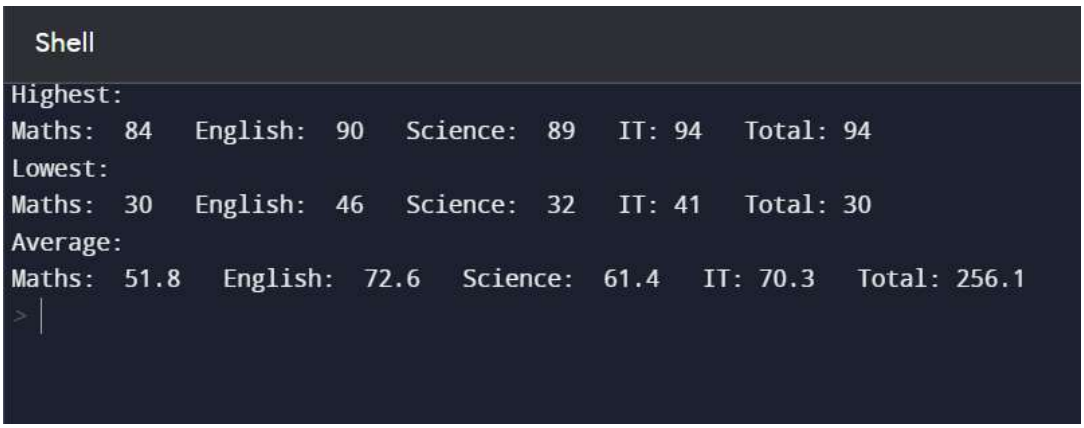
1	A class with 10 students wants to produce some information from the results of the four standard tests in Maths, Science, English and IT. Each test is out of 100 marks. The information output should be the highest, lowest and average mark for each test and the highest, lowest and average mark overall. Write a program in Python to complete this task.
2	Write a Python Program to input basic salary of an employee and calculate its Gross salary according to following: Basic Salary <= 10000 : HRA = 20%, DA = 80% Basic Salary <= 20000 : HRA = 25%, DA = 90% Basic Salary > 20000 : HRA = 30%, DA = 95%.
3	Write a Python program to check the validity of password input by users. **Validation:** • At least 1 letter between [a-z] and 1 letter between [A-Z]. • At least 1 number between [0-9]. • At least 1 character from [$#@]. • Minimum length 6 characters. • Maximum length 16 characters.
4	Create a List L that is defined as= [10, 20, 30, 40, 50, 60, 70, 80]. (i) WAP to add 200 and 300 to L. (ii) WAP to remove 10 and 30 from L. (iii) WAP to sort L in ascending order. (iv) WAP to sort L in descending order.
5	D is a dictionary defined as D= {1:"One", 2:"Two", 3:"Three", 4: "Four", 5:"Five"}. (i) WAP to add new entry in D; key=6 and value is "Six" (ii) WAP to remove key=2. (iii) WAP to check if 6 key is present in D. (iv) WAP to count the number of elements present in D. (v) WAP to add all the values present D.
6	WAP to create a list of 100 random numbers between 100 and 900. Count and print the: (i) All odd numbers (ii) All even numbers (iii) All prime numbers
7	(i) Write a function which takes principal amount, interest rate and time. This function returns compound interest. Call this function to print the output. (ii) Save this function (as a module) in a python file and call it in another python file.

Sol 1:

```
math=[37,73,49,57,46,84,34,41,30,67]

eng=[79,84,71,85,90,70,54,67,80,46]

sci=[32,81,57,46,74,59,89,57,45,74]

IT=[44,94,91,85,66,65,69,89,59,41]

tot=math+sci+eng+IT
```

```
avgMath,avgEng,avgSci,avgIT,avgTot=0,0,0,0,0

for i in math:

  avgMath=avgMath+i

for i in eng:

  avgEng=avgEng+i

for i in sci:

  avgSci=avgSci+i

for i in IT:

  avgIT=avgIT+i

for i in tot:

  avgTot=avgTot+i

print("Highest: ")

print("Maths: ",max(math), "  English: ",max(eng),"  Science: ",max(sci),"  IT:",max(IT),"
Total:",max(tot))

print("Lowest:")

print("Maths: ",min(math), "  English: ",min(eng),"  Science: ",min(sci),"  IT:",min(IT),"
Total:",min(tot))

print("Average: ")

print("Maths: ",(avgMath)/10, "  English: ",(avgEng)/10,"  Science: ",(avgSci)/10,"  IT:",(avgIT)/10,"
Total:",(avgTot)/10)
```

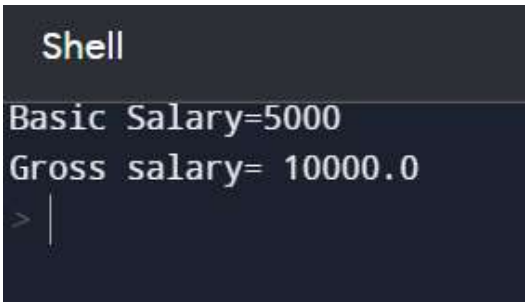
OUTPUT:



Sol 2:

```
Basic_Salary = int(input("Basic Salary="))
DA,HRA=0,0
if Basic_Salary<=10000:
  HRA,DA=(Basic_Salary * 20) / 100,(Basic_Salary * 80) / 100
elif Basic_Salary<=20000:
  HRA,DA=(Basic_Salary * 25) / 100,(Basic_Salary * 90) / 100
else:
  HRA,DA=(Basic_Salary * 30) / 100,(Basic_Salary * 95) / 100

Gross = Basic_Salary + DA + HRA
print("Gross salary=",Gross)
```

OUTPUT:

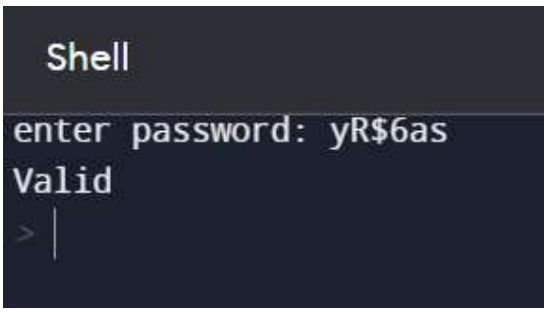


Sol 3:

```
passw = input("enter password: ")
low,up,sp,digit = 0, 0, 0, 0
if (len(passw) >= 6 and len(passw)<=16):
    for i in passw:
        if (i.isupper()):
            up=up+1
        if (i.islower()):
```

```
            low=low+1
        if(i=='@'or i=='$' or i=='#'):
            sp=sp+1
        if (i.isdigit()):
            digit=digit+1
else:
    print("Invalid")


if (low>=1 and up>=1 and sp>=1 and digit>=1 ):
    print("Valid")
else:
    print("Invalid")
```

OUTPUT:

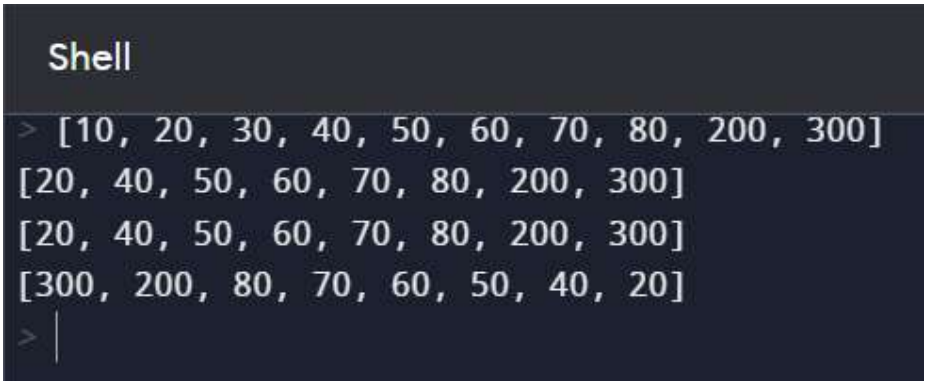


SOL 4:

```
L=[10, 20, 30, 40, 50, 60, 70, 80]
L.append(200)
L.append(300)
print(L)


L.remove(10)
L.remove(30)
```

```
print(L)


L.sort()
print(L)


L.sort(reverse=True)
print(L)
```

OUTPUT:



SOL 5:

```
D= {1:"One", 2:"Two", 3:"Three", 4: "Four", 5:"Five"}
D.update({6:"Six"})
print("key 6 added:",D)


D.pop(2)
print("key 2 deleted:",D)


if 6 in D:
  print("key 6 is present")
else:
  print("key 6 is not present")
```

```
print("length:",len(D))


sum=0
for key in D:
  sum=sum+key
print("sum:",sum)
```

```
Shell
key 6 added: {1: 'One', 2: 'Two', 3: 'Three', 4: 'Four', 5: 'Five', 6: 'Six'}
key 2 deleted: {1: 'One', 3: 'Three', 4: 'Four', 5: 'Five', 6: 'Six'}
key 6 is present
length: 5
sum: 19
>
```

SOL 6:

```
import random as rand
A=[]
for i in range(100):
  A.append(rand.randint(100,900))
even=[]
odd=[]
prime=[]
for i in A:
  if (i%2)==0:
    even.append(i)
  else:
    odd.append(i)
  isPrime=1
  for j in range(2,i):
```

```
    if i%j==0:
      isPrime=0
      break
  if isPrime:
    prime.append(i)
print("even:",even)
print("odd:",odd)
print("prime:",prime)
```

```
Shell                                                    Clear
even: [104, 856, 882, 656, 100, 278, 432, 414, 418, 756, 260, 170, 626, 326, 642, 612,
    760, 444, 658, 302, 240, 866, 602, 436, 834, 394, 750, 212, 866, 886, 764, 124, 234
    , 866, 760, 452, 416, 248, 864, 458, 548, 516, 456, 854, 196, 266, 650, 470, 770]
odd: [391, 837, 863, 427, 151, 685, 339, 157, 223, 731, 171, 887, 587, 297, 529, 693,
    765, 123, 171, 505, 341, 333, 805, 739, 137, 851, 335, 685, 883, 135, 481, 619, 691
    , 705, 475, 665, 145, 791, 379, 561, 825, 609, 529, 589, 435, 885, 611, 889, 757,
    147, 855]
prime: [863, 151, 157, 223, 887, 587, 739, 137, 883, 619, 691, 379, 757]
>
```

SOL 7:

```
def compound_interest(P,R,T):
    Amount = P * (pow((1 + R / 100), T))
    CI = Amount - P
    print("Compound interest =", CI)

compound_interest(15000, 10, 4)
```

```
Shell
Compound interest = 6961.500000000007
>
```

from com import*

compound_interest(15000, 10, 4)