

# DS Task 01

## 21K-3463

## BCS(7B)

### Question 01:

I did practice about lists from the given link and because this question doesn't have some task to upload so all the solution work is starting from questions below.

### Question 02 (Program):

```
import math as m

# Taking Input
a = int(input("Enter the value of a: "))
b = int(input("Enter the value of b: "))
c = int(input("Enter the value of c: "))

# Function to calculate Determinant
def calculateDeterminant():
    return b**2 - 4*a*c

D = calculateDeterminant()      # Function Call
print("Determinant is: ", D)

# Conditions based on D
if (D > 0):
    x1 = (-b + m.sqrt(D))/(2*a)
    x2 = (-b - m.sqrt(D))/(2*a)
    print("\nTwo real roots are")
    print("\nX1: ", round(x1, 2))
    print("\nX2: ", x2)
elif (D == 0):
```

```
x = -b/2*a
print("Real root (x) : ", x)
else:
    print("Only Complex Roots")
```

## Output:

```
Python -u "e:\UNI_WORK\Semester 07\DataSci
01\Task2.py"
Enter the value of a: 1
Enter the value of b: 2
Enter the value of c: 1

Determinant is: 0

Real root (x) : -1.0
PS E:\UNI_WORK\Semester 07\DataSci
```

```
01\Task2.py"
Enter the value of a: 1
Enter the value of b: 3
Enter the value of c: 1

Determinant is: 5

Two real roots are
    X1: -0.382
    X2: -2.618
PS E:\UNI_WORK\Semester 07\DataSci
```

```
PS E:\UNI_WORK\Semester 07\DataSci
Python -u "e:\UNI_WORK\Semester 07\Dat
01\Task2.py"
Enter the value of a: 1
Enter the value of b: 1
Enter the value of c: 1

Determinant is: -3

Only Complex Roots
PS E:\UNI_WORK\Semester 07\DataSci
```

## Question 03 (Program):

```
# Function to calculate smaller numbers
def smaller(x, s, n):
    count = 0
    for i in range(0, s):
        if x[i] < n:
            count += 1
    return count

# User's Input
print("=====")
)
print("\t\t SMALL NUMBERS COUNTER")
print("=====")
)

x = []
s = int(input("\nHow many elements are there in the array? "))
print("Add the elements of the array sequentially (Only add numbers)\n")
# Loop to add elemnts in the array
for i in range(0, s):
    temp = int(input("Enter the next element: "))
    x.append(temp)

n = int(input("\nEnter the comparison number: "))

smallCount = smaller(x, s, n)          #Function Call

print("\n\n\tOutput:")
print(f"There are {smallCount} small elements than {n} in the given
array.\n")
```

# Output:

```
PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignm
=====
                        SMALL NUMBERS COUNTER
=====

How many elements are there in the array? 9
Add the elements of the array sequentially (Only add numbers)

Enter the next element: 13
Enter the next element: 56
Enter the next element: 21
Enter the next element: 45
Enter the next element: 20
Enter the next element: 43
Enter the next element: 12
Enter the next element: 43
Enter the next element: 6

Enter the comparison number: 21

Output:
There are 4 small elements than 21 in the given array.

PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignm
```

```
PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignm
=====
                        SMALL NUMBERS COUNTER
=====

How many elements are there in the array? 9
Add the elements of the array sequentially (Only add numbers)

Enter the next element: 13
Enter the next element: 56
Enter the next element: 21
Enter the next element: 45
Enter the next element: 20
Enter the next element: 43
Enter the next element: 12
Enter the next element: 43
Enter the next element: 6

Enter the comparison number: 20

Output:
There are 3 small elements than 20 in the given array.

PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignm
```

## Question 04 (Program):

```
# Function to remove duplicates from the list
def removeduplicates(numbers):
    temp = set()
    finallist = []
    for i in numbers:
        if i not in temp:
            temp.add(i)
            finallist.append(i)
    return finallist

numbers = [12,24,35,24,88,120,155,88,120,155]      # Original list
finalnumbers = removeduplicates(numbers)          # Function Call

# Output Statements
print("\nOriginal List: ", numbers)
print("\nFinal List: ", finalnumbers, end = "\n\n")
```

## Output:

```
PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\As
UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignme

Original List: [12, 24, 35, 24, 88, 120, 155, 88, 120, 155]

Final List: [12, 24, 35, 88, 120, 155]

PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\As
```

## Question 05 (Program):

```
# List Initialization
list1 = [1,3,6,78,35,55]
list2 = [12,24,35,24,88,120,155]

# Converting lists to sets
set1 = set(list1)
set2 = set(list2)

set1 &= set2          # Intersection update method on sets

intersectedlist = list(set1)    # Converting intersected set back to list

print("\nList1: ", list1)
print("List2: ", list2)
print("\nIntersected List: ", intersectedlist, end="\n\n")
```

## Output:

```
PS E:\UNI_WORK\Semester 07\DataScience by Sir
e:\UNI_WORK\Semester 07\DataScience by Sir Nou

List1:  [1, 3, 6, 78, 35, 55]
List2:  [12, 24, 35, 24, 88, 120, 155]

Intersected List:  [35]

PS E:\UNI_WORK\Semester 07\DataScience by Sir
```

## Question 06 (Program):

```
# Function to calculate BMI
def BMICALculator(w, h):
    return w/h**2

# Menu
print("=====")
)
print("\t\t BMI  CALCULATOR")
print("=====")
)

# User Input
weight = float(input("\nEnter weight(kg): "))
height = float(input("Enter height(m): "))

print("\n=====")
)

bmi = BMICALculator(weight, height)      # Function call
print("\nBMI: ", bmi)
print("\n=====")
=)
```

## Output:

```
PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignments\A 01\Task6.py
01> python -u "e:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignments\A 01\Task6.py"
=====
                BMI  CALCULATOR
=====

Enter weight(kg): 50
Enter height(m): 1.5748

=====

BMI:  20.161330645241936

=====
```

## Question 07 (Program):

```
# Variable Initialization
growth_multiplier = 1.3
sales = 140000

print(f"\nSales in 1st year: {sales} PKR")
#Loop to iterate for 7 years
for i in range(0, 7):
    sales *= growth_multiplier

print(f"\nSales after 7 years: {sales} PKR", end = "\n\n")
```

## Output:

```
PS E:\UNI_WORK\Semester 07\DataScience by S
01> python .\Task7.py

Sales in 1st year: 140000 PKR

Sales after 7 years: 878479.238 PKR

PS E:\UNI_WORK\Semester 07\DataScience by S
01>
```

## Question 08 (Program):

```
# Function to calculate weight in stones
def calculate_weightInStones(w):
    return (w * 2.2)/14

print("\n=====
=")
print("\t\t WEIGHT in STONES CALCULATOR")
```



```

print("=====
")

# User Input
weight = float(input("\nEnter Weight(kg): "))

print("\n=====
=")

Ws = calculate_weightInStones(weight)      # Function Call
print(f"\n\tWeight in Stones: {round(Ws, 2)} stones")      # round()
rounds up the value to given decimal places

print("\n=====
=")

```

## Output:

```

PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assign
01> python .\Task8.py

=====
                WEIGHT in STONES CALCULATOR
=====

Enter Weight(kg): 50

=====

                Weight in Stones: 7.86 stones

=====
PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assign

```

## Question 09 (Program):

```
rooms = []          # Declared empty list
# User's input
n = int(input("\nHow many rooms you want to add? "))

# Loop to take input from user and insert each new entry into the list
for i in range(0, n):
    print("\n-----")
    name = input(f"\nEnter room {i+1} name: ")
    area = input(f"Enter room {i+1} area (square-meter): ")
    rooms.append(name + ' ' + area)

# Output
print("\n=====
=")
print("\nFinal rooms list: ", rooms, end="\n")
print("\n=====
=")
```

## Output:

```
PS E:\UNI WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignm
01> python .\Task9.py

How many rooms you want to add? 3

-----

Enter room 1 name: hall
Enter room 1 area (square-meter): 11.3

-----

Enter room 2 name: kitchen
Enter room 2 area (square-meter): 6

-----

Enter room 3 name: bedroom
Enter room 3 area (square-meter): 12.5

=====

Final rooms list: ['hall 11.3', 'kitchen 6', 'bedroom 12.5']

=====
```

## Question 10:

```
# Variables Initialization
n = 3
sem = 6

# Lists Declaration
Score = []
Names = []
Students = []

# Loop to take input for each student name and his/her semester wise GPA
and add into a single list students
for i in range(0, n):
    print("\n-----")
    name = input(f"\nEnter Student {i+1} name: ")
    print("")
    s = []
    for j in range(0, sem):
        gpa = float(input(f"Enter Student {i+1} Semester {j+1} GPA: "))
        s.append(gpa)
    Score.append(s)
    Names.append(name)
    Students.append(list((Names[i], Score[i])))

print("\n=====
= ")
print("\nFinal Students List: ", Students, end="\n\n")
print("\n=====
= ")
```

# Output:

```
PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignments\A 01> python .\Task10.py
```

```
-----
```

```
Enter Student 1 name: Hamza
```

```
Enter Student 1 Semester 1 GPA: 2.9
```

```
Enter Student 1 Semester 2 GPA: 3.0
```

```
Enter Student 1 Semester 3 GPA: 3.2
```

```
Enter Student 1 Semester 4 GPA: 3.4
```

```
Enter Student 1 Semester 5 GPA: 3.67
```

```
Enter Student 1 Semester 6 GPA: 3.59
```

```
-----
```

```
Enter Student 2 name: Ali
```

```
Enter Student 2 Semester 1 GPA: 3
```

```
Enter Student 2 Semester 2 GPA: 3.2
```

```
Enter Student 2 Semester 3 GPA: 2.9
```

```
Enter Student 2 Semester 4 GPA: 3.5
```

```
Enter Student 2 Semester 5 GPA: 3.61
```

```
Enter Student 2 Semester 6 GPA: 3.48
```

```
-----
```

```
Enter Student 3 name: Aneeq
```

```
Enter Student 3 Semester 1 GPA: 3.8
```

```
Enter Student 3 Semester 2 GPA: 3.9
```

```
Enter Student 3 Semester 3 GPA: 4
```

```
Enter Student 3 Semester 4 GPA: 4
```

```
Enter Student 3 Semester 5 GPA: 4
```

```
Enter Student 3 Semester 6 GPA: 3.95
```

```
=====
```

```
Final Students List: [['Hamza', [2.9, 3.0, 3.2, 3.4, 3.67, 3.59]], ['Ali', [3.0, 3.2, 2.9, 3.5, 3.61, 3.48]],  
['Aneeq', [3.8, 3.9, 4.0, 4.0, 4.0, 3.95]]
```

```
=====
```

```
PS E:\UNI_WORK\Semester 07\DataScience by Sir Nouman Durrani\Assignments\A 01> |
```