

# LOTUS VALLEY INTERNATIONAL SCHOOL: Computer Science Practical File

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## 1 Review of Python Basics

### Question 15

Write a program to calculate the mean of a given list of numbers.

#### Solution

```
1 numbers = eval(input("Enter a list: "))
2 if len(numbers) == 0:
3     print("List is empty, cannot calculate mean.")
4 else:
5     total = sum(numbers)
6     n = len(numbers)
7     mean = total / n
8     print("Mean of the numbers:", mean)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./mean.py
Enter a list: [10, 30, 25, 34, 45, 98]
Mean of the numbers: 40.333333333333336
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

### Question 16

Write a program to calculate the minimum element of a given list of numbers.

#### Solution

```
1 l = eval(input("Enter a list: "))
2 m = min(l)
3 print("Minimum element in the list:", m)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./min.py
Enter a list: [1, 4, 65, 34, 23]
Minimum element in the list: 1
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 17

Write a code to calculate and display total marks and percentage of a student from a given list storing the marks of a student.

### Solution

```
1 marks_list = eval(input("Enter list of marks: "))
2 total_marks = sum(marks_list)
3 total_subjects = len(marks_list)
4 maximum_marks_per_subject = 100
5 total_marks_possible = maximum_marks_per_subject * total_subjects
6 percentage = (total_marks / total_marks_possible) * 100
7
8 print("Total Marks:", total_marks)
9 print("Percentage:", percentage)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
Enter list of marks: [85, 90, 78, 92, 88]
Total Marks: 433
Percentage: 86.6
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 18

Write a program to multiply an element by 2 if it is an odd index for a given list containing both numbers and strings.

### Solution

```
1 mixed = eval(input("Enter the list: "))
2 for index in range(1, len(mixed), 2):
3     mixed[index] *= 2
4 print("Modified List:", mixed)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
Enter the list: [1, 'apple', 'banana', 5, 'cherry', 7, 'date', 'cherry']
Modified List: [1, 'appleapple', 'banana', 10, 'cherry', 14, 'date', 'cherrycherry']
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 19

Write a program to count the frequency of an element in a list.

### Solution

```
1 my_list = eval(input("Enter the list: "))
2 c = int(input("Enter the element whose frequency is to be checked: "))
3 frequency = my_list.count(c)
4 print("The frequency of", c, "in the list is: ", frequency)
```

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the list: [1, 2, 3, 4, 1, 2, 1, 3, 4, 5, 1]
Enter the element whose frequency is to be checked: 1
The frequency of 1 in the list is: 4
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 20

Write a program to shift elements of a list so that the first element moves to the second index and second index moves to the third index, and so on, and the last element shifts to the first position.

Suppose the list is:

```
[10, 20, 30, 40]
```

After shifting, it should look like:

```
[40, 10, 20, 30]
```

## Solution

---

```

1 l = eval(input("Enter the list: "))
2 print("Original List")
3 print(l)
4
5 l = l[-1:] + l[:-1]
6
7 print("Rotated List")
8 print(l)
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the list: [10, 20, 30, 40]
Original List
[10, 20, 30, 40]
Rotated List
[40, 10, 20, 30]
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 21

A list Num contains the following elements:

```
3, 25, 13, 6, 35, 8, 14, 45
```

Write a program to swap the content with the next value divisible by 5 so that the resultant list will look like:

```
25, 3, 13, 35, 6, 8, 45, 14
```

## Solution

---

```

1 Num = [3, 25, 13, 6, 35, 8, 14, 45]
2 for i in range(len(Num) - 1):
3     if Num[i] % 5 != 0 and Num[i + 1] % 5 == 0:
4         Num[i], Num[i + 1] = Num[i + 1], Num[i]
5 print("Resultant List:", Num)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .  
Resultant List: [25, 3, 13, 35, 6, 8, 45, 14]  
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 22

Write a program to accept values from a user in a tuple. Add a tuple to it and display its elements one by one. Also display its maximum and minimum value.

### Solution

---

```
1 tuple1 = eval(input("Enter a tuple: "))  
2 tuple2 = (10, 20, 30)  
3 combined_tuple = tuple1 + tuple2  
4 print("Elements of the combined tuple:")  
5 for element in combined_tuple:  
6     print(element)  
7  
8 print("Maximum value:", max(combined_tuple))  
9 print("Minimum value:", min(combined_tuple))
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .  
Enter a tuple: (11, 67, 34, 65, 22)  
Elements of the combined tuple:  
11  
67  
34  
65  
22  
10  
20  
30  
Maximum value: 67  
Minimum value: 10  
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 23

Write a program to input any values for two tuples. Print it, interchange it and then compare them.

### Solution

---

```
1 tuple1 = eval(input("Enter the first tuple: "))  
2 tuple2 = eval(input("Enter the second tuple: "))  
3  
4 print("Original Tuples:")  
5 print("Tuple 1:", tuple1)  
6 print("Tuple 2:", tuple2)  
7  
8 tuple1, tuple2 = tuple2, tuple1  
9  
10 print("\nSwapped Tuples:")  
11 print("Tuple 1 (after swapping):", tuple1)  
12 print("Tuple 2 (after swapping):", tuple2)  
13  
14 if tuple1 == tuple2:  
15     print("\nThe swapped tuples are equal.")
```

```
16 else:  
17     print("\nThe swapped tuples are not equal.")
```

```
pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..  
Enter the first tuple: (5, 6, 3, 8, 9)  
Enter the second tuple: (77, 33, 55, 66, 11)  
Original Tuples:  
Tuple 1: (5, 6, 3, 8, 9)  
Tuple 2: (77, 33, 55, 66, 11)  
  
Swapped Tuples:  
Tuple 1 (after swapping): (77, 33, 55, 66, 11)  
Tuple 2 (after swapping): (5, 6, 3, 8, 9)  
  
The swapped tuples are not equal.  
pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 24

Write a Python program to input 'n' classes and names of class teachers to store them in a dictionary and display the same. Also accept a particular class from the user and display the name of the class teacher of that class.

### Solution

```
1 n = int(input("Enter number of classes: "))  
2 data = {}  
3 for i in range(n):  
4     class_name = input("Enter class name: ")  
5     teacher_name = input("Enter teacher name: ")  
6     data[class_name] = teacher_name  
7 print("Class data:", data)  
8 find = input("Enter a class name to find its teacher: ")  
9 if find in data:  
10    print("Teacher for class", find, "is", data[find])  
11 else:  
12    print("Class not found in the data.")
```

```
pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..  
Enter number of classes: 4  
Enter class name: green  
Enter teacher name: Aniket  
Enter class name: yellow  
Enter teacher name: Pratibha  
Enter class name: red  
Enter teacher name: Mayuri  
Enter class name: blue  
Enter teacher name: Prithvi  
Class data: {'green': 'Aniket', 'yellow': 'Pratibha', 'red': 'Mayuri', 'blue': 'Prithvi'}  
Enter a class name to find its teacher: red  
Teacher for class red is Mayuri  
pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 25

Write a program to store student names and their percentage in a dictionary and delete a particular student name from the dictionary. Also display the dictionary after deletion.

## Solution

```
1 n = int(input("Enter number of students: "))
2 data = []
3 for i in range(n):
4     stu_name = input("Enter student name: ")
5     percentage = input("Enter percentage: ")
6     data[stu_name] = percentage
7 print("Student data:", data)
8 find = input("Enter a student name to delete: ")
9 if find in data:
10    del data[find]
11    print("Updated student data:", data)
12 else:
13    print("Student not found in the data.")
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter number of students: 4
Enter student name: Megha
Enter percentage: 98
Enter student name: Amit
Enter percentage: 88
Enter student name: Nitin
Enter percentage: 92
Enter student name: Amulya
Enter percentage: 79
Student data: {'Megha': '98', 'Amit': '88', 'Nitin': '92', 'Amulya': '79'}
Enter a student name to delete: Nitin
Updated student data: {'Megha': '98', 'Amit': '88', 'Amulya': '79'}
❖ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 26

Write a Python program to input names of 'n' customers and their details like items bought, cost and phone number, etc., store them in a dictionary and display all the details in a tabular form.

## Solution

```
1 n = int(input("Enter the number of customers: "))
2 customer_data = []
3
4 for i in range(n):
5     name = input("Enter customer name: ")
6     items_bought = input("Enter items bought: ")
7     cost = float(input("Enter cost: "))
8     phone_number = int(input("Enter phone number: "))
9
10    customer_data[name] = {
11        'Items Bought': items_bought,
12        'Cost': cost,
13        'Phone Number': phone_number
14    }
15
16 print("Customer Details:")
17 print("Name\t\tItems Bought\t\tCost\t\tPhone Number")
18 for name, details in customer_data.items():
19     print(name, "\t\t", details['Items Bought'], "\t\t", details['Cost'],
           "\t\t", details['Phone Number'])
```

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Enter the number of customers: 4
Enter customer name: Sakshi
Enter items bought: Chocolate, Icecream
Enter cost: 200
Enter phone number: 9876354678
Enter customer name: Shashank
Enter items bought: Biscuits, Maggie, Soup
Enter cost: 450
Enter phone number: 8976346378
Enter customer name: Saanvi
Enter items bought: Veggies, Coffee
Enter cost: 300
Enter phone number: 8794653923
Enter customer name: Shivank
Enter items bought: Door mat, Bottles, Boxes
Enter cost: 600
Enter phone number: 6737486827
Customer Details:
Name           Items Bought          Cost          Phone Number
Sakshi         Chocolate, Icecream   200.0        9876354678
Shashank       Biscuits, Maggie, Soup 450.0        8976346378
Saanvi         Veggies, Coffee      300.0        8794653923
Shivank        Door mat, Bottles, Boxes 600.0        6737486827

```

## Question 27

Write a Python program to capitalize first and last letters of each word of a given string.

### Solution

---

```

1 input_string = input("Enter the string: ")
2 words = input_string.split()
3 result = []
4
5 for word in words:
6     if len(word) > 1:
7         modified_word = word[0].upper() + word[1:-1] + word[-1].upper()
8     else:
9         modified_word = word.upper()
10    result.append(modified_word)
11
12 capitalized_string = ' '.join(result)
13 print(capitalized_string)

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Enter the string: the quick brown fox jumps over the lazy dog
ThE QuicK Brown FoX JumpS OveR ThE LazY DoG

```

## Question 28

Write a Python program to remove duplicate characters of a given string.

### Solution

---

```

1 input_string = input("Enter the string: ")
2 unique_chars = {}

```

---

```
3 for char in input_string:
4     if char not in unique_chars:
5         unique_chars[char] = True
6 result = ','.join(unique_chars.keys())
7 print(result)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the string: hello world
he lo wrd
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 29

Write a Python program to compute sum of digits of a given number.

### Solution

---

```
1 number = int(input("Enter a number: "))
2 sum_of_digits = 0
3 while number > 0:
4     digit = number % 10
5     sum_of_digits += digit
6     number = number // 10
7
8 print("Sum of digits:", sum_of_digits)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter a number: 4556787
Sum of digits: 42
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 30

Write a Python program to find the second most repeated word in a given string.

### Solution

---

```
1 input_string = input("Enter the string: ")
2 words = input_string.split()
3
4 word_counts = {}
5 for word in words:
6     if word in word_counts:
7         word_counts[word] += 1
8     else:
9         word_counts[word] = 1
10
11 max_count = 0
12 second_max_count = 0
13 most_repeated_word = None
14 second_most_repeated_word = None
15
16 for word, count in word_counts.items():
17     if count > max_count:
18         second_max_count = max_count
19         max_count = count
20         second_most_repeated_word = most_repeated_word
```

```
21         most_repeated_word = word
22     elif count > second_max_count:
23         second_max_count = count
24         second_most_repeated_word = word
25
26 print(second_most_repeated_word)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the string: apple banana cherry banana cherry cherry
banana
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

### Question 31

Write a Python program to change a given string to a new string where the first and last characters have been exchanged.

#### Solution

---

```
1 input_str = input("Enter the string: ")
2 first_char = input_str[0]
3 last_char = input_str[-1]
4 middle_chars = input_str[1:-1]
5 new_str = last_char + middle_chars + first_char
6 print("Original string:", input_str)
7 print("New string after swapping first and last characters:", new_str)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the string: python
Original string: python
New string after swapping first and last characters: nythop
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

### Question 32

Write a Python program to multiply all the items in a list.

#### Solution

---

```
1 lst = eval(input("Enter the list: "))
2 result = 1
3 for item in lst:
4     result *= item
5 print("Result:", result)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the list: [1, 2, 3, 4, 5, 6]
Result: 720
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

### Question 33

Write a Python program to get the smallest number from a list.

## Solution

---

```
1 numbers = eval(input("Enter the list: "))
2 smallest = min(numbers)
3 print("Smallest Number:", smallest)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
  Enter the list: [23, 44, 36, 98, 100, 15]
  Smallest Number: 15
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 34

Write a Python program to append a list to the second list.

## Solution

---

```
1 list1 = eval(input("Enter the first list: "))
2 list2 = eval(input("Enter the second list: "))
3 list1.extend(list2)
4 print("Appended List:", list1)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
  Enter the first list: [22, 44, 66, 88]
  Enter the second list: [10, 30, 50, 70, 90]
  Appended List: [22, 44, 66, 88, 10, 30, 50, 70, 90]
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 35

Write a Python program to generate and print a list of first and last 5 elements where the values are square of numbers between 1 and 30 (both included).

## Solution

---

```
1 squares = []
2 for num in range(1, 31):
3     squares.append(num ** 2)
4 first_5 = squares[:5]
5 last_5 = squares[-5:]
6 combined_list = first_5 + last_5
7 print("Combined list:", combined_list)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
  Combined list: [1, 4, 9, 16, 25, 676, 729, 784, 841, 900]
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 36

Write a Python program to get unique values from a list.

## Solution

```
1 input_list = eval(input("Enter the list: "))
2 unique_values = []
3
4 for item in input_list:
5     if item not in unique_values:
6         unique_values.append(item)
7
8 print("Unique values from the list:", unique_values)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
  Enter the list: [1, 2, 3, 3, 4, 5, 5, 6, 6, 7]
  Unique values from the list: [1, 2, 3, 4, 5, 6, 7]
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 37

Write a Python program to convert a string to a list.

## Solution

```
1 string = input("Enter the string: ")
2 char_list = list(string)
3
4 print("String converted to list:", char_list)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
  String converted to list: ['P', 'y', 't', 'h', 'o', 'n']
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 38

Write a Python script to concatenate the following dictionaries to create a new one:

```
d1 = {'A': 1, 'B': 2, 'C': 3}
d2 = {'D': 4 }
```

Output should be:

```
{'A': 1, 'B': 2, 'C': 3, 'D': 4}
```

## Solution

```
1 d1 = {'A': 1, 'B': 2, 'C': 3}
2 d2 = {'D': 4}
3 d1.update(d2)
4 print("Concatenated dictionary: ", d1)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
  Concatenated dictionary: {'A': 1, 'B': 2, 'C': 3, 'D': 4}
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 39

Write a Python script to check if a given key already exists in a dictionary.

### Solution

```
1 my_dict = eval(input("Enter the dictionary: "))
2 key_check = input("Enter the key to be checked: ")
3 if key_check in my_dict:
4     print("The key", key_check, "exists in the dictionary.")
5 else:
6     print("The key", key_check, "does not exist in the dictionary.")
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the dictionary: {'A': 1, 'B': 2, 'C': 3, 'D' : 4}
Enter the key to be checked: C
The key C exists in the dictionary.

Enter the dictionary: {'A': 1, 'B': 2, 'C': 3, 'D' : 4}
Enter the key to be checked: E
The key E does not exist in the dictionary.
✧pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 40

Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.

Sample Dictionary

```
{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81,
 10: 100, 11: 121, 12: 144, 13: 169, 14: 196, 15: 225}
```

### Solution

```
1 result_dict = {}
2 for num in range(1, 16):
3     result_dict[num] = num ** 2
4 print("Resulting dictionary:", result_dict)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./mirror.sh
Resulting dictionary: {1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81, 10: 100, 11: 121, 12: 144, 13: 169, 14: 196, 15: 225}
✧pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 41

Write a Python script to merge two Python dictionaries.

### Solution

```
1 dict1 = eval(input("Enter the first dictionary: "))
2 dict2 = eval(input("Enter the second dictionary: "))
3 dict1.update(dict2)
4 print("Merged dictionary:", dict1)
```

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the first dictionary: {1 : "Orange", 2: "Mango", 3 : "Watermelon"}
Enter the second dictionary: {4 : "Pineapple", 5 : "Banana"}
Merged dictionary: {1: 'Orange', 2: 'Mango', 3: 'Watermelon', 4: 'Pineapple', 5: 'Banana'}
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 42

Write a Python program to sort a dictionary by key.

### Solution

---

```

1 def bubble_sort_keys(keys):
2     n = len(keys)
3     for i in range(n - 1):
4         for j in range(0, n - i - 1):
5             if keys[j] > keys[j + 1]:
6                 keys[j], keys[j + 1] = keys[j + 1], keys[j]
7
8 my_dict = eval(input("Enter the dictionary: "))
9 keys_list = list(my_dict.keys())
10 bubble_sort_keys(keys_list)
11 sorted_dict = {}
12 for key in keys_list:
13     sorted_dict[key] = my_dict[key]
14
15 print("Dictionary sorted by key:", sorted_dict)
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the dictionary: {51 : "Orange", 21: "Mango", 13 : "Watermelon"}
Dictionary sorted by key: {13: 'Watermelon', 21: 'Mango', 51: 'Orange'}
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 43

Write a Python program to combine two dictionaries adding values for common keys.

```
d1 = {'a': 100, 'b': 200, 'c': 300}
d2 = {'a': 300, 'b': 200, 'd': 400}
```

Sample output:

```
Counter({'a': 400, 'b': 400, 'c': 300, 'd': 400})
```

### Solution

---

```

1 d1 = {'a': 100, 'b': 200, 'c': 300}
2 d2 = {'a': 300, 'b': 200, 'd': 400}
3 combined_dict = {}
4 for key, value in d1.items():
5     combined_dict[key] = value
6 for key, value in d2.items():
7     if key in combined_dict:
8         combined_dict[key] += value
9     else:
10        combined_dict[key] = value
```

```
11
12 print("Combined dictionary with added values for common keys:",  
      combined_dict)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./m  
Combined dictionary with added values for common keys: {'a': 400, 'b': 400, 'c': 300, 'd': 400}  
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 44

Write a Python program to find the three highest values in a dictionary.

### Solution

---

```
1 my_dict = eval(input("Enter the dictionary: "))  
2 highest_values = []  
3 highest_keys = []  
4 for key, value in my_dict.items():  
5     if not highest_values or value > highest_values[-1]:  
6         highest_values.append(value)  
7         highest_keys.append(key)  
8         if len(highest_values) > 3:  
9             highest_values.pop(0)  
10            highest_keys.pop(0)  
11  
12 my_dict = eval(input("Enter the dictionary: "))  
13 highest_values = []  
14 highest_keys = []  
15 for key, value in my_dict.items():  
16     if not highest_values or value > highest_values[-1]:  
17         highest_values.append(value)  
18         highest_keys.append(key)  
19         if len(highest_values) > 3:  
20             highest_values.pop(0)  
21             highest_keys.pop(0)  
22 print("Three highest values in the dictionary:")  
23 for i in range(len(highest_keys)):  
24     print(highest_keys[i], ":" ,highest_values[i])
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..  
Enter the dictionary: {'c': 100, 'b': 200, 'e': 300, 'd': 400, 'a': 500}  
Three highest values in the dictionary:  
e : 300  
d : 400  
a : 500  
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 45

Write a Python program to sort a list alphabetically in a dictionary.

### Solution

---

```
1 my_dict = eval(input("Enter the dictionary: "))  
2 for key, value in my_dict.items():  
3     if isinstance(value, list):
```

```

4     value.sort()
5
6 print("Sorted dictionary:", my_dict)

```

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./mirror.sh
Enter the dictionary: {'list1': ['banana', 'apple', 'cherry'], 'list2': ['orange', 'grape', 'kiwi'], 'list3': ['pear', 'watermelon', 'mango']}
Sorted dictionary: {'list1': ['apple', 'banana', 'cherry'], 'list2': ['grape', 'kiwi', 'orange'], 'list3': ['mango', 'pear', 'watermelon']}
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █

```

## Question 46

Write a Python program to count number of items in a dictionary value that is a list.

### Solution

```

1 my_dict = eval(input("Enter the dictionary: "))
2 total_count = 0
3 for value in my_dict.values():
4     if type(value) is list:
5         total_count += len(value)
6 print("Total number of items in lists within the dictionary:", total_count)

```

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./
Enter the dictionary: {'l1': [1, 2, 3, 4], 'l2': 'Apple', 'l3': [True, False], 'l4': 'Orange'}
Total number of items in lists within the dictionary: 6
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █

```

## 2 Functions

### Question 2

Write a function called calculate\_area() that takes base and height as input arguments and returns area of a triangle as an output. The formula used is: Triangle Area =  $1/2 * \text{base} * \text{height}$

### Solution

```

1 def calculate_area(base, height):
2     area = (1/2) * base * height
3     return area
4
5 base_value = int(input("Enter the base value: "))
6 height_value = int(input("Enter the height value: "))
7 triangle_area = calculate_area(base_value, height_value)
8 print("Area of the triangle:", triangle_area)

```

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the base value: 10
Enter the height value: 5
Area of the triangle: 25.0
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █

```

### Question 3

Modify the above function to take a third parameter called shape type. Shape type should be either triangle or rectangle. Based on the shape, it should calculate the area. Formula used: Rectangle Area = length \* width

### Solution

```
1 def calculate_area(base, height, shape_type):
2     if shape_type == "triangle":
3         area = (1/2) * base * height
4     elif shape_type == "rectangle":
5         area = base * height
6     else:
7         area = None
8         print("Invalid shape type. Please specify either 'triangle' or
9             'rectangle'.")
10    return area
11
12 shape_type = input("Enter the shape type, triangle or rectangle: ")
13 base_value = int(input("Enter the base value: "))
14 height_value = int(input("Enter the height value: "))
15 area = calculate_area(base_value, height_value, shape_type)
16 print("Area of the", shape_type, "is", area)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Enter the shape type, triangle or rectangle: triangle
Enter the base value: 10
Enter the height value: 5
Area of the triangle is 25.0

Enter the shape type, triangle or rectangle: rectangle
Enter the base value: 8
Enter the height value: 9
Area of the rectangle is 72
◇ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

### Question 4

Write a function called print\_pattern() that takes integer number as argument and prints the following pattern if the input number is 3.

```
*
```

  

```
**
```

  

```
***
```

If input is 4, then it should print:

```
*
```

  

```
**
```

  

```
***
```

  

```
****
```

### Solution

```
1 def print_pattern(num):
2     for i in range(1, num + 1):
```

```

3     print("*" * i)
4
5 num = int(input("Enter a number: "))
6 print("Pattern for input", num, ":")
7 print_pattern(num)

```

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./
Enter a number: 4
Pattern for input 4 :
*
**
***
****
*****

Enter a number: 5
Pattern for input 5 :
*
**
***
****
*****
*****
```

◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2\$ █

## Question 18

Write a Python program to convert the following list of dollars to rupees using functions. Also, use a void function to display the converted amount.

Given:

```

dollars = [10, 20, 30, 40]
conversion_rate = 74.5

```

Expected Output:

```

Rs. 745.0
Rs. 1490.0
Rs. 2235.0
Rs. 2980.0

```

## Solution

```

1 def convert_dollars_to_rupees(amount_in_dollars, conversion_rate):
2     amount_in_rupees = amount_in_dollars * conversion_rate
3     return amount_in_rupees
4
5 def convert_dollars_to_rupees_void(amount_in_dollars, conversion_rate):
6     amount_in_rupees = amount_in_dollars * conversion_rate
7     print("Amount in rupees:", amount_in_rupees)
8
9 amount = float(input("Enter amount in dollars "))
10 conversion_rate = float(input("Enter conversion rate "))
11
12 # Non-void function call
13 converted_amount = convert_dollars_to_rupees(amount, conversion_rate)
14 print("Converted amount (non-void function):", converted_amount)
15

```

```
16 # Void function call
17 convert_dollars_to_rupees_void(amount, conversion_rate)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter amount in dollars 50
Enter conversion rate 74.5
Converted amount (non-void function): 3725.0
Amount in rupees: 3725.0
```

```
Enter amount in dollars 100
Enter conversion rate 75
Converted amount (non-void function): 7500.0
Amount in rupees: 7500.0
```

```
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 19

Write a Python program to calculate volume of a box with appropriate default values for its parameters. Your function should have the following input parameters:

- Length of box
- Width of box
- Height of box

Test it by writing a complete program to invoke it.

## Solution

```
1 def calculate_volume(length = 5, width = 3, height = 2):
2     return length * width * height
3
4 default_volume = calculate_volume()
5 print("Volume of the box with default values:", default_volume)
6
7 v = calculate_volume(10, 7, 15)
8 print("Volume of the box with default values:", v)
9
10 a = calculate_volume(length = 23, height = 6)
11 print("Volume of the box with default values:", a)
12
13 b = calculate_volume(width = 19)
14 print("Volume of the box with default values:", b)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Volume of the box with default values: 30
Volume of the box with default values: 1050
Volume of the box with default values: 414
Volume of the box with default values: 190
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 20

Write a program to display first four multiples of a number using recursion.

## Solution

---

```
1 def display_multiples(n, count = 1):
2     if count > 4:
3         return
4     print(n * count)
5     display_multiples(n, count + 1)
6
7 n = int(input("Enter the number: "))
8 display_multiples(n)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
  Enter the number: 11
  11
  22
  33
  44
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 22

Write a recursive function to add the first 'n' terms of the series:

$$1 + 1/2 - 1/3 + 1/4 - 1/5\dots$$

## Solution

---

```
1 def add_series_terms(n):
2     if n == 1:
3         return 1
4     elif n % 2 == 0:
5         return add_series_terms(n - 1) + 1 / n
6     else:
7         return add_series_terms(n - 1) - 1 / n
8
9 n = int(input("Enter the term: "))
10 print(add_series_terms(n))
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
  Enter the term: 2
  1.5

  Enter the term: 5
  1.2166666666666668
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 23

Write a program to find the greatest common divisor between two numbers.

## Solution

---

```
1 def gcd(a, b):
2     while b:
3         a, b = b, a % b
4     return a
```

---

```
5
6 num1 = int(input("Enter the first number: "))
7 num2 = int(input("Enter the second number: "))
8 gcd_value = gcd(num1, num2)
9 print("The greatest common divisor of", num1, "and", num2, "is",
      gcd_value)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./gcd.py
Enter the first number: 24
Enter the second number: 6
The greatest common divisor of 24 and 6 is 6
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 24

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

Sample List: (8, 2, 3, -1, 7)

Expected Output: -336

## Solution

```
1 def multiply_list(numbers):
2     product = 1
3     for num in numbers:
4         product *= num
5     return product
6
7 numbers = eval(input("Enter the list: "))
8 product = multiply_list(numbers)
9 print("The product of the numbers in the list is", product)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./multiply_list.py
Enter the list: [8, 2, 3, -1, 7]
The product of the numbers in the list is -336

Enter the list: [1, 6, 3, 5]
The product of the numbers in the list is 90
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 25

Write a Python function to calculate the factorial of a number (a non-negative integer). The function accepts the number whose factorial is to be calculated as the argument.

## Solution

```
1 def factorial(n):
2     product = 1
3     for i in range(1, n + 1):
4         product *= i
5     return product
6
7 n = int(input("Enter a number: "))
```

```
8 fact = factorial(n)
9 print("The factorial of", n, "is", fact)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Enter a number: 5
The factorial of 5 is 120.

Enter a number: 0
The factorial of 0 is 1.
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 26

Write a Python function that takes a number as a parameter and checks whether the number is prime or not.

### Solution

```
1 def is_prime(n):
2     if n <= 1:
3         return False
4     factors = 0
5     for i in range(1, n + 1):
6         if n % i == 0:
7             factors += 1
8         if factors > 2:
9             return False
10    return True
11
12 num = int(input("Enter a number: "))
13 is_prime_num = is_prime(num)
14 print("Is", num, "prime?", is_prime_num)
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
Enter a number: 4
Is 4 prime? False

Enter a number: 29
Is 29 prime? True
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 27

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

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

### Solution

```
1 def is_palindrome(s):
2     s = s.lower()
3     return s == s[::-1]
4
5 input_string = input("Enter a string: ")
```

```
6 if is_palindrome(input_string):  
7     print(input_string, "is a palindrome.")  
8 else:  
9     print(input_string, "is not a palindrome.")
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .  
Enter a string: madam  
madam is a palindrome.  
  
Enter a string: nursesrun  
nursesrun is a palindrome.  
  
Enter a string: watermelon  
watermelon is not a palindrome.  
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 28

Write a Python program that accepts a hyphen-separated sequence of words as input and prints the words in a hyphen-separated sequence after sorting them alphabetically.

Sample Items: green-red-yellow-black-white

Expected Result: black-green-red-white-yellow

## Solution

```
1 def sort_words(s):  
2     words = s.split(' - ')  
3     words.sort()  
4     return ' - '.join(words)  
5  
6 input_str = input('Enter a hyphen-separated sequence of words: ')  
7 print(sort_words(input_str))
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .  
Enter a hyphen-separated sequence of words: green-red-yellow-black-white  
black-green-red-white-yellow  
  
Enter a hyphen-separated sequence of words: delhi-bangalore-mumbai-chennai-lucknow-patna  
bangalore-chennai-delhi-lucknow-mumbai-patna  
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## 3 File Handling

### Question 9

Write a code snippet that will create an object called fileout for writing; associate it with the filename 'STRS'. The code should keep on writing strings to it as long as the user wants.

## Solution

---

```
1 fileout = open('STRS.txt', 'w')
2 ans = 'y'
3 while ans == 'y':
4     string = input("Enter a string: ")
5     fileout.write(string + "\n")
6     ans = input("Want to enter more strings?(y/n)... ")
7 fileout.close()
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
  Enter a string: Hello
  Want to enter more strings?(y/n)...y
  Enter a string: World!
  Want to enter more strings?(y/n)...n
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

```
1 Hello
2 World!|
```

## Question 14

Write a program that reads a text file and creates another file that is identical except that every sequence of consecutive blank spaces is replaced by a single space.

### Solution

Let the file “input.txt” include the following sample text:

```
In the beginning there was chaos.
Out of the chaos came order.
The universe began to take shape.
Stars formed and galaxies were born.
Life emerged in the vast expanse.
```

---

```
1 with open("input.txt", 'r') as f:
2     with open("output.txt", 'w') as fout:
3         for line in f:
4             modified_line = ' '.join(line.split())
5             fout.write(modified_line + '\n')
```

---

```
1 In the beginning there was chaos.  
2 Out of the chaos came order.  
3 The universe began to take shape.  
4 Stars formed and galaxies were born.  
5 Life emerged in the vast expanse.|
```

### Question 15

A file 'sports.dat' contains information in the following format: EventName, Participant

Write a function that would read contents from file 'sports.dat' and create a file named 'Athletic.dat' copying only those records from 'sports.dat' where the event name is "Athletics".

### Solution

Let the file "sports.dat" include the following sample records:

```
Athletics - Rahul  
Swimming - Tanvi  
Athletics - Akash  
Cycling - Kabir  
Athletics - Riya
```

---

```
1 def filter_records(input_file, output_file):  
2     with open(input_file, 'r') as f_in:  
3         with open(output_file, 'w') as f_out:  
4             for line in f_in:  
5                 event, participant = line.strip().split(' - ')  
6                 if event == 'Athletics':  
7                     f_out.write(line)  
8  
9 filter_records('sports.dat', 'Athletic.dat')
```

---

```
1 Athletics - Rahul
2 Athletics - Akash
3 Athletics - Riya
```

### Question 16

Write a program to count the words “to” and “the” present in a text file “Poem.txt”.

#### Solution

Let the file “Poem.txt” include the following sample text:

```
To be or not to be, that is the question.
The quick brown fox jumps over the lazy dog.
To infinity and beyond!
The sun sets in the west.
To be successful, one must work hard.
```

---

```
1 to_count = 0
2 the_count = 0
3
4 with open("Poem.txt", 'r') as file:
5     for line in file:
6         words = line.split()
7         for word in words:
8             if word.lower() == 'to':
9                 to_count += 1
10            elif word.lower() == 'the':
11                the_count += 1
12
13 print("count of 'to': ", to_count)
14 print("count of 'the': ", the_count)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
count of 'to': 4
count of 'the': 5
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

### Question 17

Write a program to count the number of uppercase alphabets present in a text file “Poem.txt”.

## Solution

Let the file “Poem.txt” include the following sample text:

```
PYTHON is a Popular Programming Language.
```

---

```
1 with open("Poem.txt", 'r') as file:
2     text = file.read()
3     count = 0
4     for char in text:
5         if char.isupper():
6             count += 1
7
8 print(count)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ..
9
↳ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 18

Write a program that copies one file to another. Have the program read the file names from user.

## Solution

---

```
1 def copy_file(file1, file2):
2     with open(file1, 'r') as source:
3         with open(file2, 'w') as destination:
4             destination.write(source.read())
5
6 source_file = input("Enter the name of the source file: ")
7 destination_file = input("Enter the name of the destination file: ")
8
9 copy_file(source_file, destination_file)
```

---

## Question 19

Write a program that appends the contents of one file to another. Have the program take the file names from the user.

## Solution

---

```
1 def append_file(f1, f2):
2     with open(f1, 'r') as source:
3         with open(f2, 'a') as destination:
4             destination.write(source.read())
5
6 source_file = input("Enter the name of the source file: ")
7 destination_file = input("Enter the name of the destination file: ")
8
9 append_file(source_file, destination_file)
```

---

## Question 20

Write a program that reads characters from the keyboard one by one. All lower case characters get stored inside the file 'LOWER', all upper case characters get stored inside the file 'UPPER' and all other characters get stored inside file 'OTHERS'.

### Solution

```
1 lower_file = open("LOWER.txt", 'w')
2 upper_file = open("UPPER.txt", 'w')
3 others_file = open("OTHERS.txt", 'w')
4 ans = 'y'
5 while ans == 'y':
6     char = input("Enter a character: ")
7     if char.islower():
8         lower_file.write(char + "\n")
9     elif char.isupper():
10        upper_file.write(char + "\n")
11    else:
12        others_file.write(char + "\n")
13    ans = input("Want to enter a character? (y/n): ")
14 lower_file.close()
15 upper_file.close()
16 others_file.close()
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ ./lower_upper.py
Enter a character: e
Want to enter a character? (y/n): y
Enter a character: A
Want to enter a character? (y/n): y
Enter a character: D
Want to enter a character? (y/n): y
Enter a character: c
Want to enter a character? (y/n): y
Enter a character: 7
Want to enter a character? (y/n): y
Enter a character: @
Want to enter a character? (y/n): n
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 21

Write a program to search the names and addresses of persons having age more than 30 in the data list of persons stored in a text file.

### Solution

Let the file "Persons.txt" include the following sample text:

Samyukta, Mumbai, 35  
Anubhav, Chennai, 28  
Aniket, Hyderabad, 42  
Sarth, Bangalore, 31

```
1 f = open('Persons.txt', 'r')
2 lines = f.readlines()
3 for line in lines:
4     data = line.strip().split(',')
```

```
5     if len(data) >= 3 and int(data[2]) > 30:
6         print('Name:', data[0], 'Address:', data[1])
7 f.close()
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Name: Samyukta Address: Mumbai
Name: Aniket Address: Hyderabad
Name: Sarth Address: Bangalore
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 22

Write a function in Python to count and display the number of lines starting with alphabet 'A' present in a text file "LINES.TXT", e.g., the file "LINES.TXT" contains the following lines:

```
A boy is playing there.
There is a playground.
An aeroplane is in the sky.
A cricket match is being played.
```

The function should display the output as 3.

## Solution

```
1 def count_lines(file_name):
2     count = 0
3     with open(file_name, 'r') as file:
4         for line in file:
5             if line.strip().startswith('A'):
6                 count += 1
7     print(count)
8
9 count_lines("LINES.TXT")
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
3
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 26

Write a program to accept string/sentences from the user till the user enters "END". Save the data in a text file and then display only those sentences which begin with an uppercase alphabet.

## Solution

```
1 f = open("new.txt", "w")
2 while True:
3     st = input("Enter next line:")
4     if st == "END":
5         break
6     f.write(st + '\n')
7 f.close()
8
9 f = open("new.txt", "r")
10 while True:
```

```
11     st = f.readline()
12     if not st:
13         break
14     if st[0].isupper():
15         print(st)
16 f.close()
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Enter next line:Hello world
Enter next line:welcome to
Enter next line:Python programming
Enter next line:END
Hello world

Python programming
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 27

Write a function to insert a sentence in a text file, assuming that text file is very big and can't fit in computer's memory.

### Solution

Let the file "insert.txt" include the following sample text:

```
Bees hum
leaves rustle
Waves crash
nature's voice whispers
```

---

```
1 def insert_sentence(file_path, sentence):
2     file = open(file_path, 'a')
3     file.write(sentence + '\n')
4     file.close()
5 insert_sentence("insert.txt", "life's essence glimmers")
```

---

```
1 Bees hum
2 leaves rustle
3 Waves crash
4 nature's voice whispers
5 life's essence glimmers
```

## Question 28

Write a program to read a file 'Story.txt' and create another file, storing an index of 'Story.txt', telling which line of the file each word appears in. If word appears more than once, then index should show all the line numbers containing the word.

### Solution

Let the file "Story.txt" include the following sample text:

```
The cat sleeps
The dog barks
The cat jumps
The sun shines
```

---

```
1 word_index = []
2 file = open('Story.txt', 'r')
3 line_number = 1
4 lines = file.readlines()
5 for line in lines:
6     words = line.strip().split()
7     for word in words:
8         if word in word_index:
9             word_index[word].append(str(line_number))
10        else:
11            word_index[word] = [str(line_number)]
12    line_number += 1
13 file.close()
14
15 index_file = open('index.txt', 'w')
16 for word, line_numbers in word_index.items():
17     line_numbers_str = ", ".join(line_numbers)
18     index_file.write(word + ":" + line_numbers_str + "\n")
19 index_file.close()
```

---

```
1 The:1, 2, 3, 4
2 cat:1, 3
3 sleeps:1
4 dog:2
5 barks:2
6 jumps:3
7 sun:4
8 shines:4
```

## Question 29

Write a program to accept a filename from the user and display all the lines from the file which contain Python comment character '#'.

---

### Solution

Let the file "notes.txt" include the following sample text:

```
Welcome to the Garden of Dreams
#where the ordinary becomes extraordinary
#the impossible becomes possible.
```

---

```
1 file_name = input("Enter the filename: ")
2 file = open(file_name, 'r')
3 lines = file.readlines()
4 for line in lines:
5     if '#' in line:
6         print(line)
7 file.close()
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Enter the filename: notes.txt
#where the ordinary becomes extraordinary
#the impossible becomes possible.
◊ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 31

Write a Python program to display the size of a file after removing EOL characters, leading and trailing white spaces and blank lines.

### Solution

Let the file "sample.txt" include the following sample text:

```
The sky is blue\n
```

```
Clouds float gently in the sky.
```

```
Birds sing sweet melodies.
```

---

```
1 file = open('sample.txt', 'r')
2 lines = file.readlines()
3 original_size = 0
4 for line in lines:
5     original_size += len(line)
6 print("Original file size:", original_size)
7 file.close()
8
9 file = open('sample.txt', 'r')
10 cleaned_size = 0
11 for line in file:
12     cleaned_line = line.strip()
13     if cleaned_line:
14         cleaned_size += len(cleaned_line)
15 file.close()
16 print("Cleaned file size:", cleaned_size)
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .  
Original file size: 126  
Cleaned file size: 74  
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 32

Write a function Remove\_Lowercase() that accepts two file names, and copies all lines that do not start with lowercase letter from the first file into the second file.

### Solution

Let the file “file1.txt” include the following sample text:

```
Dew on petals, morning's gift.  
silent moon, silver glow.  
Winds whisper, secrets shared.  
rain's embrace, earth's renewal.
```

---

```
1 def Remove_Lowercase(input_file, output_file):  
2     input_file = open(input_file, 'r')  
3     output_file = open(output_file, 'w')  
4     for line in input_file:  
5         if line.strip() and line[0].isupper():  
6             output_file.write(line)  
7     input_file.close()  
8     output_file.close()  
9  
10 input_file = 'file1.txt'  
11 output_file = 'file2.txt'  
12 Remove_Lowercase(input_file, output_file)
```

---

```
1 Dew on petals, morning's gift.  
2 Winds whisper, secrets shared.|
```

## Question 33

Write a program to display all the records in a file along with line/record number.

### Solution

Let the file “f1.txt” include the following sample text:

```
Soft whispers of the wind.  
A melody in the trees.  
Sun-kissed petals dance.  
A garden's quiet song.
```

---

```
1 file_name = 'f1.txt'  
2 line_number = 1  
3 f = open(file_name, 'r')
```

```
4 for line in f:  
5     print("Line", line_number, ":", line.strip())  
6     line_number += 1  
7 f.close()
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$  
Line 1 : Soft whispers of the wind.  
Line 2 : A melody in the trees.  
Line 3 : Sun-kissed petals dance.  
Line 4 : A garden's quiet song.  
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

### Question 34

Write a method in Python to write multiple line of text contents into a text file “mylife.txt”.

#### Solution

```
1 def write_to_file(file_path):  
2     lines_to_write = ["The sun sets over the horizon.", "Birds chirp in  
3                         the morning.", "Raindrops patter on the roof.", "Leaves rustle in  
4                         the breeze."]  
5     with open(file_path, "w") as file:  
6         for line in lines_to_write:  
7             file.write(line + '\n')
```

---

```
1 1001, Ankit Singh, 50000, Manager  
2 1002, Neha Patel, 45000, Developer  
3 1003, Manoj Tiwari, 48000, Analyst  
4 1004, Aarti Gupta, 52000, Engineer
```

### Question 35

Write a method in Python to read the content from a text file “DIARY.TXT” line by line and display the same on the screen.

#### Solution

```
1 def diary_content(f):  
2     myfile = open(f, "r")  
3     str = ""  
4     while str:  
5         str = myfile.readline()  
6         print(str, end = '')  
7     myfile.close()  
8
```

```
9 diary_content("DIARY.TXT")
```

---

### Question 36

Write appropriate statements to do the following:

- (a) To open a file named “RESULT.DAT” for output.
- (b) To go to the end of the file at any time.

### Solution

- (a) To open a file named “RESULT.DAT” for output:

```
1 file = open("RESULT.DAT")
```

---

- (b) To go to the end of the file at any time:

```
1 file.seek(0, 2)
```

---

### Question 37

Write a program to add two more employees’ details (empno, ename, salary, designation) to the file “emp.txt” already stored in disk.

### Solution

Let the file “emp.txt” include the following sample text:

```
1001, Ankit Singh, 50000, Manager  
1002, Neha Patel, 45000, Developer
```

---

```
1 file = open("emp.txt", "a")  
2 file.write("1003, Manoj Tiwari, 48000, Analyst\n")  
3 file.write("1004, Aarti Gupta, 52000, Engineer\n")
```

---

### Question 42

Anant has been asked to display all the students who have scored less than 40 for Remedial Classes. Write a user-defined function to display all those students who have scored less than 40 from the binary file “Student.dat”.

### Solution

Let the file “Student.dat” include the following sample data:

```
Radhika 80  
Shaurya 35  
Sonia 38  
Anirudh 45
```

---

```
1 import pickle  
2  
3 def display_students(file_name):  
4     file = open(file_name, 'rb')  
5     students = pickle.load(file)  
6     for student in students:
```

```

7     name = student[0]
8     score = student[1]
9     if score < 40:
10        print(name)
11    file.close()
12 display_students('student.dat')

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
Shaurya
Sonia
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █

```

## Question 43

Following is the structure of each record in a data file named “PRODUCT.DAT”.

```
{"prod_code": value, "prod_desc": value, "stock": value}
```

The values for prod\_code and prod\_desc are strings and the value for stock is an integer.

Write a function in Python to update the file with a new value of stock. The stock and the prod\_code, whose stock is to be updated, are to be inputted during the execution of the function.

## Solution

Let the file “PRODUCT.dat” include the following sample data:

```
{'prod_code': 'AB', 'prod_desc': 'Books', 'stock': 50}
{'prod_code': 'AC', 'prod_desc': 'Pens', 'stock': 75}
{'prod_code': 'AD', 'prod_desc': 'Pencils', 'stock': 30}
```

---

```

1 import pickle
2
3 def update_stock(file_name, product_code, new_stock):
4     products = []
5     f = open(file_name, 'rb')
6     while True:
7         try:
8             product = pickle.load(f)
9             products.append(product)
10        except EOFError:
11            break
12    f.close()
13    updated = False
14    for product in products:
15        if product['prod_code'] == product_code:
16            product['stock'] = new_stock
17            updated = True
18            break
19    f = open(file_name, 'wb')
20    for product in products:
21        pickle.dump(product, f)
22    f.close()
23 P_code = input("Enter the product code: ")
24 New = int(input("Enter the new stock value: "))
25 update_stock('PRODUCT.DAT', P_code, New)

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Enter the product code: AB
Enter the new stock value: 100

Product.dat Content:
{'prod_code': 'AB', 'prod_desc': 'Books', 'stock': 100}
{'prod_code': 'AC', 'prod_desc': 'Pens', 'stock': 75}
{'prod_code': 'AD', 'prod_desc': 'Pencils', 'stock': 30}
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

## Question 44

Given a binary file “STUDENT.DAT”, containing records of the following type:

[S\_Admno, S\_Name, Percentage]

Where these three values are:

S\_Admno — Admission Number of student (string)

S\_Name — Name of student (string)

Percentage — Marks percentage of student (float)

Write a function in Python that would read contents of the file “STUDENT.DAT” and display the details of those students whose percentage is above 75.

## Solution

Let the file “STUDENT.dat” include the following sample data:

```

[[‘101’, ‘Aishwarya’, 97.0],
[‘102’, ‘Sakshi’, 85.0],
[‘103’, ‘Prateek’, 70.0]]

```

---

```

1 import pickle
2
3 def display_students(filename):
4     file = open(filename, ‘rb’)
5     student_records = pickle.load(file)
6     above_75 = []
7     for student in student_records:
8         if student[2] > 75.0:
9             above_75.append(student)
10    if above_75:
11        print(“Students with percentage above 75:”)
12        for student in above_75:
13            print(“Admission Number:”, student[0], “Name:”,
14                  student[1], “Percentage:”, student[2])
15    file.close()
16 display_students(“STUDENT.DAT”)

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
Students with percentage above 75:
Admission Number: 101 Name: Aishwarya Percentage: 97.0
Admission Number: 102 Name: Sakshi Percentage: 85.0
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

## Question 50

Write a program to enter the following records in a binary file:

- Item No — integer
- Item\_Name — string
- Qty — integer
- Price — float

Number of records to be entered should be accepted from the user. Read the file to display the records in the following format:

Item No:  
Item Name:  
Quantity:  
Price per item:  
Amount: (to be calculated as Price \* Qty)

## Solution

---

```
1 import pickle
2
3 with open("item.dat", 'wb') as itemfile:
4     n = int(input("How many records to be entered? "))
5     for i in range(n):
6         ino = int(input("Enter item no: "))
7         iname = input("Enter item name: ")
8         qty = int(input("Enter quantity: "))
9         price = float(input("Enter price: "))
10        item = {"Item no": ino, "Item Name": iname, "Qty": qty, "Price":
11                  price}
12        pickle.dump(item, itemfile)
13        print("Successfully written item data")
14
15 with open("item.dat", "rb") as file:
16     try:
17         while True:
18             item = pickle.load(file)
19             print("\nItem No:", item["Item no"])
20             print("Item Name:", item["Item Name"])
21             print("Quantity:", item["Qty"])
22             print("Price per item:", item["Price"])
23             print("Amount:", item["Qty"] * item["Price"])
24     except EOFError:
25         pass
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
How many records to be entered? 5
Enter item no: 11
Enter item name: Mobile
Enter quantity: 4
Enter price: 20000
Enter item no: 12
Enter item name: Laptop
Enter quantity: 2
Enter price: 35000
Enter item no: 13
Enter item name: Computer
Enter quantity: 1
Enter price: 50000
Enter item no: 14
Enter item name: Television
Enter quantity: 4
Enter price: 25000

Item No: 11
Item Name: Mobile
Quantity: 4
Price per item: 20000.0
Amount: 80000.0

Item No: 12
Item Name: Laptop
Quantity: 2
Price per item: 35000.0
Amount: 70000.0

Item No: 13
Item Name: Computer
Quantity: 1
Price per item: 50000.0
Amount: 50000.0

```

## Question 51

Create a CSV file “Groceries” to store information of different items existing in a shop. The information is to be stored w.r.t. each item code, name, price, qty. Write a program to accept the data from user and store it permanently in CSV file.

### Solution

---

```

1 import csv
2
3 with open("Groceries.csv", mode = 'w', newline = '') as file:
4     writer = csv.writer(file)
5
6     while True:
7         item_code = int(input("Enter Item Code: "))
8         name = input("Enter Name of the Item: ")
9         price = float(input("Enter Price: "))
10        quantity = int(input("Enter Quantity: "))
11
12        writer.writerow([item_code, name, price, quantity])
13        choice = input("Wish to enter more records (Y/N)?: ")
14        if choice.upper() == 'N':
15            break

```

---

```
1 101, Soaps, 45.5, 5
2 102, Atta, 34.0, 2
3 103, Maggie, 70.0, 1
```

## 4 Data Structures

### Question 7

Write an interactive menu-driven program implementing Stack using list. The list is storing numeric data.

#### Solution

---

```
1 def push(num):
2     h = int(input("Enter a number: "))
3     num.append(h)
4
5 def pop(num):
6     if len(num) == 0:
7         print("No number to delete")
8     else:
9         print("Deleted number is:", num.pop())
10
11 def display(num):
12     print(num)
13
14 num = []
15 while True:
16     print("1. Add number")
17     print("2. Delete number")
18     print("3. Display numbers")
19     print("4. Exit")
20     op = int(input("Enter the Choice: "))
21     if op == 1:
22         push(num)
23     elif op == 2:
24         pop(num)
25     elif op == 3:
26         display(num)
27     elif op == 4:
28         print("Exiting program.")
29         break
30     else:
31         print("Invalid choice. Please enter a number between 1 and 4.")
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
1. Add number
2. Delete number
3. Display numbers
4. Exit
Enter the Choice: 1
Enter a number: 2
1. Add number
2. Delete number
3. Display numbers
4. Exit
Enter the Choice: 1
Enter a number: 4
1. Add number
2. Delete number
3. Display numbers
4. Exit
Enter the Choice: 1
Enter a number: 6
1. Add number
2. Delete number
3. Display numbers
4. Exit
Enter the Choice: 1
Enter a number: 8
1. Add number
2. Delete number
3. Display numbers
4. Exit
Enter the Choice: 3
[2, 4, 6, 8]
1. Add number
2. Delete number
3. Display numbers
4. Exit

```

## Question 8

Write an interactive menu-driven program to implement Stack using list. The list contains the names of students.

### Solution

---

```

1 def push(student):
2     h = input("Enter a name: ")
3     student.append(h)
4
5 def pop(student):
6     if len(student) == 0:
7         print("No name to delete")
8     else:
9         print("Deleted name is:", student.pop())
10
11 def display(student):
12     print(student)
13
14 student = []
15 while True:
16     print("1. Add name")
17     print("2. Delete name")
18     print("3. Display names")

```

```

19     print("4. Exit")
20     op = int(input("Enter the Choice: "))
21     if op == 1:
22         push(student)
23     elif op == 2:
24         pop(student)
25     elif op == 3:
26         display(student)
27     elif op == 4:
28         print("Exiting program.")
29         break
30     else:
31         print("Invalid choice. Please enter a number between 1 and 4.")

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
1. Add name
2. Delete name
3. Display names
4. Exit
Enter the Choice: 1
Enter a name: Prajwal
1. Add name
2. Delete name
3. Display names
4. Exit
Enter the Choice: 1
Enter a name: Amrita
1. Add name
2. Delete name
3. Display names
4. Exit
Enter the Choice: 1
Enter a name: Kavya
1. Add name
2. Delete name
3. Display names
4. Exit
Enter the Choice: 1
Enter a name: Drishti
1. Add name
2. Delete name
3. Display names
4. Exit
Enter the Choice: 3
['Prajwal', 'Amrita', 'Kavya', 'Drishti']
1. Add name
2. Delete name
3. Display names
4. Exit

```

## 5 Relational Databases and SQL

### Question 17

Write SQL queries to perform the following based on the table PRODUCT having fields as (prod\_id, prod\_name, quantity, unit\_rate, price, city)

- (i) Display those records from table PRODUCT where prod\_id is more than 100.
- (ii) List records from table PRODUCT where prod\_name is 'Almirah'.

- (iii) List all those records whose price is between 200 and 500.
- (iv) Display the product names whose price is less than the average of price.
- (v) Show the total number of records in the table PRODUCT.

### Solution

(i)

---

```
1 SELECT * FROM PRODUCT
2 WHERE prod_id > 100;
```

---

(ii)

---

```
1 SELECT * FROM PRODUCT
2 WHERE prod_name = 'Almirah';
```

---

(iii)

---

```
1 SELECT * FROM PRODUCT
2 WHERE price BETWEEN 200 AND 500;
```

---

(iv)

---

```
1 SELECT prod_name
2 FROM PRODUCT
3 WHERE price < (SELECT AVG(price) FROM PRODUCT);
```

---

(v)

---

```
1 SELECT COUNT(*) AS total_records FROM PRODUCT;
```

---

### Question 20

Consider the following EMP and DEPT tables:

**Table: EMP**

EmpNo	EmpName	City	Designation	DOJ	Sal	Comm	DeptID
8369	SMITH	Mumbai	CLERK	1990-12-18	800.00	NULL	20
8499	ANYA	Varanasi	SALESMAN	1991-02-20	1600.00	300.00	30
8521	SETH	Jaipur	SALESMAN	1991-02-22	1250.00	500.00	30
8566	MAHADEVAN	Delhi	MANAGER	1991-04-02	2985.00	NULL	20

**Table: DEPT**

DeptID	DeptName	MgrID	Location
10	SALES	8566	Mumbai
20	PERSONNEL	9698	Delhi
30	ACCOUNTS	4578	Delhi
40	RESEARCH	8839	Bengaluru

Write the SQL command to get the following:

- (a) Show the minimum, maximum and average salary of managers.

- (b) Count the number of clerks in the organization.
- (c) Display the designation-wise list of employees with name, salary and date of joining.
- (d) Count the number of employees who are not getting commission.
- (e) Show the average salary for all departments having salary  $> 2000$ .
- (f) List the count of employees grouped by DeptID.
- (g) Display the maximum salary of employees in each department.
- (h) Display the name of employees along with their designation and department name.
- (i) Count the number of employees working in ACCOUNTS department.

### Solution

(a)

---

```
1 SELECT MIN(Sal) AS MinSalary, MAX(Sal) AS MaxSalary, AVG(Sal) AS AvgSalary
2 FROM EMP
3 WHERE Designation = 'MANAGER';
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+-----+
| MinSalary | MaxSalary | AvgSalary |
+-----+-----+-----+
|      2985 |      2985 |      2985 |
+-----+-----+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(b)

---

```
1 SELECT COUNT(*) AS ClerkCount
2 FROM EMP
3 WHERE Designation = 'CLERK';
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+
| ClerkCount |
+-----+
|          1 |
+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(c)

---

```
1 SELECT Designation, EmpName, Sal, DOJ
2 FROM EMP
3 ORDER BY Designation;
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+-----+
| Designation | EmpName | Sal | DOJ |
+-----+-----+-----+
| CLERK      | SMITH   | 800 | 1990-12-18 |
| MANAGER    | MAHADEVAN | 2985 | 1991-04-02 |
| SALESMAN   | ANYA    | 1600 | 1991-02-20 |
| SALESMAN   | SETH    | 1250 | 1991-02-22 |
+-----+-----+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

(d)

---

```

1 SELECT COUNT(*) AS No_comm
2 FROM EMP
3 WHERE comm is NULL;

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+
| No_comm |
+-----+
|      2 |
+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

(e)

---

```

1 SELECT D.DeptName , AVG(E.Sal) AS AvgSalary
2 FROM EMP E, DEPT D
3 WHERE E.DeptID = D.DeptID AND E.Sal > 2000
4 GROUP BY D.DeptName;

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+-----+
| DeptName | AvgSalary |
+-----+-----+
| PERSONNEL |      2985 |
+-----+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

(f)

---

```

1 SELECT DeptID , COUNT(*) AS EmpCount
2 FROM EMP
3 GROUP BY DeptID;

```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+-----+
| DeptID | EmpCount |
+-----+-----+
|      20 |         2 |
|      30 |         2 |
+-----+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

(g)

---

```
1 SELECT D.DeptName , MAX(E.Sal) AS MaxSalary
2 FROM EMP E, DEPT D
3 WHERE E.DeptID = D.DeptID
4 GROUP BY D.DeptName;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+
| DeptName | MaxSalary |
+-----+-----+
| PERSONNEL |      2985 |
| ACCOUNTS  |      1600 |
+-----+-----+
◊ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(h)

---

```
1 SELECT EMP.EMPNAME , EMP.DESIGNATION , DEPT.DEPTNAME
2 FROM EMP , DEPT
3 WHERE EMP.DEPTID = DEPT.DEPTID;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+-----+
| EMPNAME | DESIGNATION | DEPTNAME |
+-----+-----+-----+
| SMITH   | CLERK       | PERSONNEL |
| ANYA    | SALESMAN    | ACCOUNTS  |
| SETH    | SALESMAN    | ACCOUNTS  |
| MAHADEVAN | MANAGER    | PERSONNEL |
+-----+-----+-----+
◊ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(i)

---

```
1 SELECT COUNT(*) AS NUM_EMP
2 FROM EMP , DEPT
3 WHERE EMP.DEPTID = DEPT.DEPTID
4 AND DEPTNAME = 'ACCOUNTS' ;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+
| NUM_EMP |
+-----+
|      2 |
+-----+
◊ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ █
```

## Question 21

Write SQL commands for (i) to (vi) and write output for (vii) on the basis of the following PRODUCTS relation given below:

Table: PRODUCTS

PCODE	PNAME	COMPANY	PRICE	STOCK	MANUFACTURE	WARRANTY
P001	TV	BPL	10000	200	2018-01-12	3
P002	TV	SONY	12000	150	2017-03-23	4
P003	PC	LENOVO	39000	100	2018-04-09	2
P004	PC	COMPAQ	38000	120	2019-06-20	2
P005	HANDYCAMS	SONY	18000	250	2017-03-23	3

- (i) To show details of all PCs with stock more than 110.
- (ii) To list the company which gives warranty of more than 2 years.
- (iii) To find stock value of the BPL company where stock value is the sum of the products of price and stock.
- (iv) To show number of products from each company.
- (v) To count the number of PRODUCTS which shall be out of warranty on 20-NOV-2020.
- (vi) To show the average price of all products.
- (vii) Give the output of the following statements:
  - (a) SELECT COUNT(DISTINCT COMPANY) FROM PRODUCTS;
  - (b) SELECT MAX(PRICE) FROM PRODUCTS WHERE WARRANTY = 3;

## Solution

(i)

```
1 SELECT *
2 FROM PRODUCTS
3 WHERE PNAME = 'PC' AND STOCK > 110;
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+-----+-----+-----+
| PCODE | PNAME | COMPANY | PRICE | STOCK | MANUFACTURE | WARRANTY |
+-----+-----+-----+-----+-----+
| P004 | PC    | COMPAQ | 38000 | 120  | 2019-06-20 | 2        |
+-----+-----+-----+-----+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(ii)

```
1 SELECT DISTINCT COMPANY
2 FROM PRODUCTS
3 WHERE WARRANTY > 2;
```

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+
| COMPANY |
+-----+
| BPL     |
| SONY    |
+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(iii)

---

```
1 SELECT COMPANY, SUM(PRICE * STOCK) AS StockValue
2 FROM PRODUCTS
3 WHERE COMPANY = 'BPL';
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+
| COMPANY | StockValue |
+-----+-----+
| BPL     |      2000000 |
+-----+-----+
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(iv)

---

```
1 SELECT COMPANY, COUNT(*) AS ProductCount
2 FROM PRODUCTS
3 GROUP BY COMPANY;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+
| COMPANY | ProductCount |
+-----+-----+
| BPL     |          1 |
| SONY    |          2 |
| LENOVO  |          1 |
| COMPAQ  |          1 |
+-----+-----+
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(v)

---

```
1 SELECT COUNT(*)
2 FROM PRODUCTS
3 WHERE DATE_ADD(MANUFACTURE, INTERVAL WARRANTY YEAR) <= '2020-11-20';
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+
| COUNT(*) |
+-----+
|      2   |
+-----+
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(vi)

---

```
1 SELECT AVG(PRICE) FROM PRODUCTS;
```

---

(vii)

---

(a)

---

```
1 SELECT COUNT(DISTINCT COMPANY) FROM PRODUCTS;
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+
| COUNT(DISTINCT COMPANY) |
+-----+
|          4 |
+-----+
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

(b)

---

```
1 SELECT MAX(PRICE) FROM PRODUCTS WHERE WARRANTY <= 3;
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+
| MAX(PRICE) |
+-----+
|      39000 |
+-----+
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 

```

## Question 22

Write SQL commands for (i) to (vi) on the basis of relations given below:

**Table: BOOKS**

Book_ID	Book_name	Author_name	Publishers	Price	Type	qty
K0001	Let us C	Y. Kanetkar	EPB	450	Prog	15
P0001	Computer Networks	B. Agarwal	FIRST PUBL	755	Comp	24
M0001	Mastering C++	K.R. Venugopal	EPB	165	Prog	60
N0002	VC++ advance	P. Purohit	TDH	250	Prog	45
K0002	Programming with Python	Sanjeev	FIRST PUBL	350	Prog	30
L02	Computer Science with Python	Sumita Arora	Dhanpat rai	655	Prog	16
L04	Computer Science with Python	Preeti Arora	Sultan chand	550	Prog	20
L05	Concise Mathematics	R.K.Bansal	Selina	600	Maths	10

**Table: ISSUED**

Book_ID	Qty_Issued
L02	13
L04	5
L05	21

- (i) To show the books of "FIRST PUBL" Publishers written by P.Purohit.
- (ii) To display cost of all the books published for FIRST PUBL.
- (iii) Depreciate the price of all books of EPB publishers by 5%.
- (iv) To display the bookname and price of the books, more than 3 copies of which have been issued.
- (v) To show total cost of books of each type.
- (vi) To show the details of the costliest book.

## Solution

(i)

---

```
1 SELECT BOOK_NAME
2 FROM BOOKS
3 WHERE PUBLISHERS = "FIRST PUBL" AND AUTHOR_NAME = "P. PUROHIT";
```

---

(ii)

```
1 SELECT SUM(Price * qty) AS Cost
2 FROM BOOKS
3 WHERE Publishers = 'FIRST PUBL'
4 GROUP BY publishers;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ +-----+
| Cost   |
+-----+
| 28620 |
+-----+
◊ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

---

(iii)

```
1 UPDATE BOOKS
2 SET Price = Price - (Price * 5/100)
3 WHERE Publishers = 'EPB';
```

---

(iv)

```
1 SELECT b.Book_name, b.Price
2 FROM BOOKS b, ISSUED i
3 WHERE b.Book_ID = i.Book_ID and i.Qty_Issued > 3;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ +-----+-----+
| Book_name           | Price |
+-----+-----+
| Computer Science with python | 655 |
| Computer Science with python | 550 |
| Concise Mathematics       | 600 |
+-----+-----+
◊ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

---

(v)

```
1 SELECT Type, SUM(Price * qty) AS Total_Cost
2 FROM BOOKS
3 GROUP BY Type;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ +-----+-----+
| Type    | Total_Cost |
+-----+-----+
| Prog    |      59070 |
| Maths   |      6000  |
| Comp    |     18120  |
+-----+-----+
◊ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

---

(vi)

---

```
1 SELECT *
2 FROM BOOKS
3 WHERE Price = (SELECT MAX(Price) FROM BOOKS);
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ 
+-----+-----+-----+-----+-----+
| book_id | book_name      | author_name | publishers | price | type | qty |
+-----+-----+-----+-----+-----+
| P001    | Computer Networks | B.Agarwal   | FIRST PUBL | 755  | Comp | 24  |
+-----+-----+-----+-----+-----+
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## Question 27

Write SQL Commands/output for the following on the basis of the given table:

**Table: FURNITURE**

NO	ITEM	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	White Lotus	DoubleBed	2002-02-23	3000	25
2	Pinkfeathers	BabyCot	2002-01-29	7000	20
3	Dolphin	BabyCot	2002-02-19	9500	20
4	Decent	OfficeTable	2002-02-01	25000	30
5	Comfortzone	DoubleBed	2002-02-12	25000	30
6	Donald	BabyCot	2002-02-24	6500	15

- (i) To list the details of furniture whose price is more than 10000.
- (ii) To list the Item name and Price of furniture whose discount is between 10 and 20.
- (iii) To delete the record of all items where discount is 30.
- (iv) To display the price of 'Babycot'.
- (v) To list item name, type and price of all items whose names start with 'D'.

## Solution

(i)

---

```
1 SELECT *
2 FROM FURNITURE
3 WHERE PRICE > 10000;
```

---

```
● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+-----+-----+-----+-----+
| NO | ITEM      | TYPE      | DATEOFSTOCK | PRICE | DISCOUNT |
+-----+-----+-----+-----+-----+
| 4  | Decent    | OfficeTable | 2002-02-01 | 25000 | 30        |
| 5  | Comfortzone | DoubleBed | 2002-02-12 | 25000 | 30        |
+-----+-----+-----+-----+-----+
✧ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(ii)

---

```
1 SELECT ITEM, PRICE
2 FROM FURNITURE
3 WHERE DISCOUNT BETWEEN 10 AND 20;
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+-----+
| ITEM | PRICE |
+-----+-----+
| Pinkfeathers | 7000 |
| Dolphin | 9500 |
| Donald | 6500 |
+-----+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(iii)

---

```
1 DELETE FROM FURNITURE WHERE DISCOUNT = 30;
```

---

(iv)

---

```
1 SELECT PRICE
2 FROM FURNITURE
3 WHERE TYPE = 'BabyCot';
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+
| PRICE |
+-----+
| 7000 |
| 9500 |
| 6500 |
+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

(v)

---

```
1 SELECT ITEM, TYPE, PRICE
2 FROM FURNITURE
3 WHERE ITEM LIKE 'D%';
```

---

```

● pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$ .
+-----+-----+-----+
| ITEM | TYPE | PRICE |
+-----+-----+-----+
| Dolphin | BabyCot | 9500 |
| Decent | OfficeTable | 25000 |
| Donald | BabyCot | 6500 |
+-----+-----+-----+
◆ pranavverma@pranav-dell:~/Github/Languages/Python3/School/Class XII/Practical File/Boards/V2$
```

## 6 Interfacing Python with SQL

### Question 11

Write a program to display all records in ascending order of their salary from table employee.

**Table: EMPLOYEE**

EMPNO	ENAME	DEPT	SALARY
1	RAJESH	IT	60000
2	MANOJ KUMAR	HISTORY	65000
3	ANUSHA	MARKETING	70000
4	ABHAY	FASHION STUDIES	45000

## Solution

---

```
1 import mysql.connector
2 mydb = mysql.connector.connect(host = "localhost",
3                                user = "root",
4                                passwd = "123",
5                                database = "School")
6 mycursor = mydb.cursor()
7 mycursor.execute("select * FROM EMPLOYEE ORDER BY SALARY")
8 myrecords = mycursor.fetchall()
9 for row in myrecords:
10    print(row)
11 mycursor.close()
12 mydb.close()
```

---

## Question 12

Write a program to increase salary of the employee, whose name is "MANOJ KUMAR", by 3000.

## Solution

---

```
1 import mysql.connector
2 mydb = mysql.connector.connect(host = "localhost",
3                                user = "root",
4                                passwd = "123",
5                                database = "School")
6 mycursor = mydb.cursor()
7 mycursor.execute("UPDATE employee SET salary = salary + 3000 WHERE Ename
     = 'MANOJ KUMAR'")
8 mydb.commit()
```

---

## Question 13

Write a program to delete the employee record whose name is read from keyboard at execution time.

## Solution

---

```
1 import mysql.connector
2 mydb = mysql.connector.connect(host = "localhost",
3                                user = "root",
4                                passwd = "123",
5                                database = "School")
6 mycursor = mydb.cursor()
7 employee_name = input("Enter the name of the employee to delete: ")
8 mycursor.execute("DELETE FROM employee WHERE ENAME = %s",
     (employee_name,))
9 print(mycursor.rowcount, "Record Deleted")
```

---

## Question 14

Create a database TESTDB.

## Solution

---

```
1 import mysql.connector
2 conn = mysql.connector.connect(host = 'localhost',
```

```
3                         user = 'root',
4                         passwd = '123')
5 cursor = conn.cursor()
6 cursor.execute("CREATE DATABASE TESTDB")
7 conn.commit()
8 conn.close()
```

---

## Question 15

Create a table EMPLOYEE with Fields FIRST\_NAME, LAST\_NAME, AGE, GENDER and INCOME.

## Solution

```
1 import mysql.connector
2 mydb = mysql.connector.connect(host = 'localhost',
3                                 user = 'root',
4                                 passwd = '123',
5                                 database = "kboat_cbse_12")
6 mycursor = mydb.cursor()
7 mycursor.execute("CREATE table EMPLOYEE (FIRST_NAME VARCHAR(45),
     LAST_NAME VARCHAR(45), AGE INTEGER, GENDER VARCHAR(10), INCOME FLOAT)")
8 mydb.commit()
9 mycursor.close()
10 mydb.close()
```

---