Python Programming

Practice – 3

Overview

This practice reinforces us with the understanding of compound data types in Python.

- *Manipulation of List and Tuples.*
- *Using Sets and performing Set operations like Union, Intersection etc.*
- *Creation & Manipulation of Dictionaries.*

We shall put these elements together to create simple basic Python programs.

Hands On

1. Write a menu driven program with the following option to implement stack using the list data structure.

```
S T A C K   M E N U

[a] Push.
[b] Pop.
[c] Display
[d] Quit
```

2. Write a menu driven program with the following option to implement queue using the list data structure.

```
Q U E U E      M E N U

[a] Insert Into the Q.
[b] Delete From the Q.
[c] Display Q
[d] Quit
```

3. Accept a **POSTFIX** expression from the user and compute it. Use list as the data structure for stacking purpose.

4. Accept data into the N elements of an list and perform the following:

   [a] Linear Search
   [b] Binary Search

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5. Initialize a list with the following values, (each represents the maximum number of days in a month). Accept month and year from the user and display the maximum number of days in that month.

   31 28 31 30 31 30 31 31 30 31 30 31

   NOTE : Care has to be taken in case of leap year (Feb will be 29 days)

6. Write a program to accept the marks of students for two subjects. The average of the marks secured by the student is calculated and stored in an list

   [a] The maximum in each subject is 100. Perform necessary validation.
   [b] Find the number of students whose average lies in the range
   < 40
   >= 40 to < 60
   >= 60 to < 80
   >= 80 to < 100
   ==100
   [c] Display the averages in ascending / descending order as per user's wish
   [d] Display the highest and lowest average marks.

7. Start Python in Interactive Mode and perform the following:

   [a] The creation of TUPLE data structure
   [b] Manipulation of TUPLE
   [c] The immutable property of TUPLE
   [d] Tuple packing and unpacking

8. Write a program to illustrate the **SET** data structure along with the following operations:

   [a] Membership test
   [b] Set Operations : Union, Intersection & Difference

9. Write a program to find the Roman equivalent for a given single digit number using dictionary data structure.

10. A dictionary stores the Employee ID and other employee details like Name, Gender, Business Unit and Basic Salary.
    Write a program to find the Net Pay for the given Employee ID

    ```
    Net Pay = Basic Salary + HRA + DA – PF
    ```

    ```
    HRA is 20% of the Basic Salary
    ```

```
DA is 12% of the Basic Salary
PF is 8% of the Basic Salary
```

11. A dictionary holds the Country Name and it President.
    Write a program to have a menu with the following options.

    [a] Given the country name the President is obtained.
        Ensure that country name which is not part of the dictionary is taken care.
    [b] Display all the countries with their respective Presidents.
    [c] Remove the key-value pair for a given key.

    NOTE : Use only single words to represents countries and presidents.