PYTHON ASSIGNMENT-2

1. What is Dictionary? Explain about Dictionary class Properties.
2. Explain about a) Dictionary Operators b)Operators used with Dictionaries with examples.
3. Explain any 5 Dictionary Methods.
4. Tuple objects can be Dictionary Key. Justify the statement with Example.
5. How to   a) Access Dictionary item
             b) Add   Dictionary item
             c) Remove Dictionary item
             d) Change Dictionary item
6. Explain Looping Through a Dictionary
7. Demonstrate: i) How a dictionary items can be represented as a list of tuples.
   ii) How tuples can be used as keys in dictionaries?
8. Write Python program to check for the presence of a key in the dictionary and find the sum all its values.
9. What is Dictionary? How it is different from list? Write a Python Program to Count the Occurrence of character in a String and print the Count.
10. What are Python Sets and Set items? Explain.
11. Explain how to remove duplicates from a list using Set Constructor.
12. How to :
    a) Access Set items
    b) Add Set items
    c) Remove Set items
13. Write a note on a)Set Operators b)Set Methods
14. Illustrate the following Set methods with an example.
    a) intersection() b) union() c) issubset() d) difference() e) update() f) discard()
15. Write a note on Random Module.
16. Expand ACSII. Give the decimal ASCII code and Binary code for &, a, 0, K, @, ?, ! .
17. Explain ord() and chr() with examples.
18. Write a function encoding() that takes a string as input and prints the ASCII code—in decimal, hex, and binary notation—of every character in it.
    >>> encoding('dad')
    Char Decimal Hex Binary
    d   100   64 1100100
    a   97   61 1100001
    d   100   64 1100100
19. Write function char(low, high) that prints the characters corresponding to ASCII decimal codes i for all values of i from low up to and including high.
    >>> char(62, 67)
    62 : >
    63 : ?
    64 : @
    65 : A
    66 : B
    67 : C

20. What is a Class ? How to define a class in Python? How to instantiate a class and how the class members are accessed?

21. Differentiate class variables and instance variables.
    Write a program that has a class Point with attributes as X and Y co-ordinates. Create two objects of this class and find the mid-point of both the points. Add a method reflex_x to class point ,which returns a new point ,which is the reflection of the point about the x_axis.
    Ex: point(5,6) => reflex_x returns point (5,-10)

22. Write a Python program to express instances as return values to define a class RECTANGLE with members width, height, corner_x ,corner_y and member function: to find centre ,area, perimeter of a rectangle.

23. What is the difference between method and function ? explain the working of the init method with suitable code.

24. Develop a class BankAccount that supports these methods:
    • __init__(): Initializes the bank account balance to the value of the input argument, or to 0 if no input argument is given
    • withdraw(): Takes an amount as input and withdraws it from the balance
    • deposit(): Takes an amount as input and adds it to the balance
    • balance(): Returns the balance on the account
    ```
    >>> x = BankAccount(700)
    >>> x.balance()
    700.00
    >>> x.withdraw(70)
    >>> x.balance()
    630.00
    >>> x.deposit(7)
    >>> x.balance()
    637.00
    ```

25. Write a container class called PriorityQueue. The class should supports methods:
    • insert(): Takes a number as input and adds it to the container
    • min(): Returns the smallest number in the container
    • removeMin(): Removes the smallest number in the container
    • isEmpty(): Returns True if container is empty, False otherwise
    The overloaded operator len() should also be supported.
    ```
    >>> pq = PriorityQueue()
    >>> pq.insert(3)
    >>> pq.insert(1)
    >>> pq.insert(5)
    >>> pq.insert(2)
    >>> pq.min()
    1
    >>> pq.removeMin()
    >>> pq.min()
    2
    >>> pq.size()
    3
    ```

```
>>> pq.isEmpty()
False
```

26. What are Container Classes ?explain with suitable examples
27. Write a note on User Defined Exceptions.
28. Define inheritance. Differentiate between multiple and multi-level inheritance.
29. Define : i)Class ii)Instantiation iii) Object iv)Function overloading v) Data member
30. Explain briefly about Operator Overloading with suitable example.
31. Define : i)Class inheritance ii)Data hiding iii)Method overriding iv)Child method v)Class variable
32. Every Object has an associated Namespace. Justify the statement with Example.
33. Develop a new class called Animal that abstracts animals and supports three methods:
    • setSpecies(species): Sets the species of the animal object to species.
    • setLanguage(language): Sets the language of the animal object to language.
    • speak(): Prints a message from the animal as shown below.
    Here is how we want the class to behave:
    ```
    >>> snoopy = Animal()
    >>> snoopy.setpecies('dog')
    >>> snoopy.setLanguage('bark')
    >>> snoopy.speak() I am a dog and I bark.
    ```
34. Define Constructor. Explain the Types of Constructors with Examples.
35. Explain Constructor Overloading with Example.
36. Explain a)Single inheritance b) Multiple inheritance c) Multilevel inheritance d)Hierarchical inheritance e) Hybrid inheritance with Examples.
37. What is Recursion? Explain the process of solving a problem recursively. Implement recursive method reverse() that takes a nonnegative integer as input and prints the digits of n vertically, starting with the low-order digit.
    ```
    >>> reverse(3124)
    4
    2
    1
    3
    ```
38. Write the Python Program
    a) Implementing function pattern() that takes a nonnegative integer n and prints a number pattern:
    ```
    >>> pattern(0)
    0
    >>> pattern(1)
    010
    >>> pattern(2)
    0102010
    >>> pattern(3)
    010201030102010
    >>> pattern(4)
    0102010301020104010201030102010
    ```

b) Implement recursive method pattern2() that takes a nonnegative integer as input and prints the pattern shown next. The patterns for inputs 0 and 1 are nothing and one star, respectively:

```
>>> pattern2(0)
>>> pattern2(1)
*
>>> pattern2(2)
*
**
*
>>> pattern2(3)
*
**
*
***
*
**
*
```

39. Recursion is used to develop a virus scanner. Explain with Examples.
40. Explain Run Time Analysis with Examples.
41. Write a Python Program for Linear Search.
42. Write a Python Program for Binary Search.
43. Write a Python Program for
   a) Checking the Uniqueness of a given list.
   b) Finding the Kth smallest item in an unsorted list.
   c) Computing the Most Frequently Occurring Item in a list.
44. Write a Python Program for Tower of Hanoi Problem.
45. The recursive formula for computing the number of ways of choosing k items out of a set of n items, denoted C(n, k), is:

$$C(n,k) = \begin{cases} 1 & \text{if } k = 0 \\ 0 & \text{if } n < k \\ C(n-1, k-1) + C(n-1, k) & \text{otherwise} \end{cases}$$

The first case says there is one way to choose no item; the second says that there is no way to choose more items than available in the set. The last case separates the counting of sets of k items containing the last set item and the counting of sets of k items not containing the last set item.
Write a recursive function combination() that computes C(n,k) using this recursive formula. >>> combinations(2, 1)

```
0
>>> combinations(1, 2)
2
>>> combinations(2, 5)
10
```

46. What is Tkinter Programming? What are the steps to create a GUI application using Tkinter ? Explain with example.
47. What are Tkinter Widgets? Explain any 5 with syntax.

48. Write a Python Program to bulid a GUI window
    a)With Widget label for displaying text
    b)With Widget label for displaying image
49. Illustrate Multiple Widgets GUI with example.
50. What is grid() method? How it is used in implementation of the phone dial GUI?
51. Implement a GUI app that contains two buttons labelled "Local time" and "Greenwich time". When the first button is pressed, the local time should be printed in the shell. When the second button is pressed, the Greenwich Mean Time should be printed.
    >>>
    Local time
    Day: 08 Jul 2011
    Time: 13:19:43 PM
    Greenwich time
    Day: 08 Jul 2011
    Time: 18:19:46 PM
    You can obtain the current Greenwich Mean Time using the function gmtime() from module time.
52. Explain any 3 Entry and Text Widget Methods.
53. Write a note on: a) Entry Widget b) Canvas Widget.
54. a)Write a Python script to concatenate following dictionaries to create a new one.
    Sample Dictionary :
    dic1={1:10, 2:20}
    dic2={3:30, 4:40}
    dic3={5:50,6:60}
    Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
    b)Write a Python program to find the highest 3 values in a dictionary.
55. a)Write a Python program to check if a set is a subset of another set.
    b) Write a Python program to find maximum and the minimum value in a set.