Assignment 1

Objective of this assignment:

- to understand the syntax of Python programming
- to understand Python instructions

Program list:

1. Ramesh's basic salary is input through the keyboard. His dearness allowance is 40% of basic salary, and house rent allowance is 20% of basic salary. Write a program to calculate his gross salary.

2. The distance between two cities (in km.) is input through the keyboard. Write a program to convert and print this distance in meters, feet, inches and centimeters.

3. If the marks obtained by a student in five different subjects are input through the keyboard, find out the aggregate marks and percentage marks obtained by the student. Assume that the maximum marks that can be obtained by a student in each subject is 100.

4. Temperature of a city in Fahrenheit degrees is input through the keyboard. Write a program to convert this temperature into Centigrade degrees.

5. The length & breadth of a rectangle and radius of a circle are input through the keyboard. Write a program to calculate the area & perimeter of the rectangle, and the area & circumference of the circle.

6. Two numbers are input through the keyboard into two locations C and D. Write a program to interchange the contents of C and D.

7. If a five-digit number is input through the keyboard, write a program to calculate the sum of its digits.(Hint: Use the modulus operator '%')

8. If a five-digit number is input through the keyboard, write a program to reverse the number.

9. If a four-digit number is input through the keyboard, write a program to obtain the sum of the first and last digit of this number.

10. In a town, the percentage of men is 52. The percentage of total literacy is 48. If total percentage of literate men is 35 of the total population, write a program to find the total number of illiterate men and women if the population of the town is 80,000.

11. A cashier has currency notes of denominations 10, 50 and 100. If the amount to be withdrawn is input through the keyboard in hundreds, find the total number of currency notes of each denomination the cashier will have to give to the withdrawer.

12. If the total selling price of 15 items and the total profit earned on them is input through the keyboard, write a program to find the cost price of one item.

13. If a five-digit number is input through the keyboard, write a program to print a new number by adding one to each of its digits. For example if the number that is input is 12391 then the output should be displayed as 23402.

Assignment- 2

Objective:

- improve the concept of if-else by doing handson practise.
- to develop clear understanding of decision control.

Program list:

1. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit he made or loss he incurred.
2. Any integer is input through the keyboard. Write a program to find out whether it is an odd number or even number.
3. Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not.
4. According to the Gregorian calendar, it was Monday on the date 01/01/1900. If any year is input through the keyboard write a program to find out what is the day on 1 st January of this year.
5. A five-digit number is entered through the keyboard. Write a program to obtain the reversed number and to determine whether the original and reversed numbers are equal or not.
6. If the ages of Ram, Shyam and Ajay are input through the keyboard, write a program to determine the youngest of the three.
7. Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered through the keyboard. A triangle is valid if the sum of all the three angles is equal to 180 degrees.
8. Find the absolute value of a number entered through the keyboard.
9. Given the length and breadth of a rectangle, write a program to find whether the area of the rectangle is greater than its perimeter. For example, the area of the rectangle with length = 5 and breadth = 4 is greater than its perimeter.
10. Given three points (x1, y1), (x2, y2) and (x3, y3), write a program to check if all the three points fall on one straight line.
11. Given the coordinates (x, y) of a center of a circle and it's radius, write a program which will determine whether a point lies inside the circle, on the circle or outside the circle. (Hint: Use sqrt( ) and pow( ) functions)
12. Given a point (x, y), write a program to find out if it lies on the x-axis, y-axis or at the origin, viz. (0, 0).
13. Any year is entered through the keyboard, write a program to determine whether the year is leap or not. Use the logical operators && and ||.
14. A library charges a fine for every book returned late. For first 5 days the fine is 50 paise, for 6-10 days fine is one rupee and above 10 days fine is 5 rupees. If you return the book after 30 days your membership will be cancelled. Write a program to accept the number of days the member is late to return the book and display the fine or the appropriate message.
15. If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is valid or not. The triangle is valid if the sum of two sides is greater than the largest of the three sides.
16. If the three sides of a triangle are entered through the keyboard, write a program to check whether the triangle is isosceles, equilateral, scalene or right angled triangle.
17. In a company, worker efficiency is determined on the basis of the time required for a worker to complete a particular job. If the time taken by the worker is between 2 – 3 hours, then the worker is said to be highly efficient. If the time required by the worker is between 3 – 4 hours, then the worker is ordered to improve speed. If the time taken is between 4 – 5 hours,

the worker is given training to improve his speed, and if the time taken by the worker is more than 5 hours, then the worker has to leave the company. If the time taken by the worker is input through the keyboard, find the efficiency of the worker.

18. An Insurance company follows following rules to calculate premium.

- If a person's health is excellent and the person is between 25 and 35 years of age and lives in a city and is a male then the premium is Rs. 4 per thousand and his policy amount cannot exceed Rs. 2 lakhs.
- If a person satisfies all the above conditions except that the sex is female then the premium is Rs. 3 per thousand and her policy amount cannot exceed Rs. 1 lakh.
- If a person's health is poor and the person is between 25 and 35 years of age and lives in a village and is a male then the premium is Rs. 6 per thousand and his policy cannot exceed Rs. 10,000.
- In all other cases the person is not insured.
  Write a program to output whether the person should be insured or not, his/her premium rate and maximum amount for which he/she can be insured.

Assignment 3

Objective:

- To make the students familiar with the control flow of various loop
- To make the students understand the difference between *for* loop and *while* loop
- To make the apply the concept of loop to solve some real life problems

Program list:

1. Write a program to calculate overtime pay of 10 employees. Overtime is paid at the rate of Rs. 12.00 per hour for every hour worked above 40 hours. Assume that employees do not work for fractional part of an hour.
2. Write a program to find the factorial value of any number entered through the keyboard.
3. Two numbers are entered through the keyboard. Write a program to find the value of one number raised to the power of another.
4. Write a program to print all the ASCII values and their equivalent characters using a while loop. The ASCII values vary from 0 to 255[chr(110) will print ascii character of the value 110. ord('A') will print corresponding ASCII value of 'A']
5. Write a program to print out all Armstrong numbers between 1 and 500. If sum of cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number. For example, 153 = (1 * 1 * 1) + (5 * 5 * 5) + (3 * 3 * 3)
6. Write a program for a matchstick game being played between the computer and a user. Your program should ensure that the computer always wins. Rules for the game are as follows:

- There are 21 matchsticks.
- The computer asks the player to pick 1, 2, 3, or 4 matchsticks.
- After the person picks, the computer does its picking.
- Whoever is forced to pick up the last matchstick loses the game.

7. Write a program to enter the numbers till the user wants and at the end it should display the count of positive, negative and zeros entered.
8. Write a program to find the octal equivalent of the entered number.
9. Write a program to print all prime numbers from 1 to 300. (Hint: Use nested loops, break and continue)
10. Write a program to find the range of a set of numbers. Range is the difference between the smallest and biggest number in the list.
11. Write a program to fill the entire screen with a smiling face. The smiling face has an ASCII value 1
12. Write a program to add first seven terms of the following series using a for loop: $\frac{1}{1!}+\frac{2}{2!}+\frac{3}{3!}+\ldots+\frac{n}{n!}$
13. Write a program to generate all combinations of 1, 2 and 3 using for loop.
14. A machine is purchased which will produce earning of Rs. 1000 per year while it lasts. The machine costs Rs. 6000 and will have a salvage of Rs. 2000 when it is condemned. If 12 percent per annum can be earned on alternate investments what would be the minimum life of the machine to make it a more attractive investment compared to alternative investment?
15. When interest compounds q times per year at an annual rate of r % for n years, the principle p compounds to an amount a as per the following formula. Write a program to read 10 sets of p, r, n & q and calculate the corresponding as.

$$a = p\left(1+\frac{r}{q}\right)^{np}$$

Assignment 4

Objective:

- to understand the control flow of a function
- to build comprehensive idea of function by hands on learning

Program List:

1. Write a program in C to find the square of any number using the function.
2. Write a program in C to check if a given number is even or odd using the function.
3. Write a program in C to calculate sum of Fibonacci series.
4. Write a program in C to calculate H.C.F using while loop.
5. Write a program in C to calculate l.c.m using while loop.
6. Write a program in C to print sum of all +ve numbers and all -ve numbers.
7. Write a program in C to check whether an inputted number is palindrome.
8. Write a program in C to calculate combinatoric C(n,r) using function.
9. Write a program in C to calculate Power(a,b) using function.
10. Write a program in C to calculate factorial of a natural number.

Assignment 5

Objective:

- To learn all the operations and functions of string to process string more efficiently
- To learn parsing of string as the fundamental component of NLP
- To practice maximum programs from string to crack first round of placement drive.

Programs:

1. Write a program to take input a string of digits and convert it to an integer without using int() function.
2. Write a program to take binary input numbers and convert it to an integer without using int() function.
3. WAP to remove i^th character of a string.
4. WAP to calculate the length of a string, avoid space.
5. WAP to print even length words in a string.
6. Write a program uppercase Half String.
7. Write a program to capitalize the first and last character of each word in a string
8. Python program to check if a string has at least one letter and one number
9. Write a program to accept the strings which contain all vowels
10. Write a program to count the Number of matching characters in a pair of string
11. Write a program to remove all duplicates from a given string in Python, keeping the first character only
12. Write a program to least Frequent Character in String
13. Write a program to maximum frequency character in String
14. Write a program to odd Frequency Characters
15. Write a program to specific Characters Frequency in String List
16. Write a program to frequency of numbers in String
17. Write a program to program to check if a string contains any special character
18. Write a program to generating random strings until a given string is generated
19. Write a program to find words that are greater than the given length k
20. Write a program for removing i-th character from a string
21. Write a program to split and join a string
22. Write a program to find all close matches of input string from a list
23. Write a program to find uncommon words from two Strings
24. Write a program to swap commas and dots in a String
25. Write a program to print permutation of a given string using inbuilt function
26. Write a program to convert numeric words to numbers
27. Write a program to word location in String
28. Write a program to find consecutive characters frequency
29. Write a program to preform string slicing in Python to rotate a string
30. Write a program to string slicing in Python to check if a string can become empty by recursive deletion
31. Write a program to find minimum number of rotations to obtain actual string
32. Write a program to sort String list by K character frequency

Assignment -6

Objective:

- To practice the programs of list
- to solve the programs like creating list, retrieving data from the list, change existing value of list, removing the list items.

Problem:

1. Program to declare and print a list.
2. Python program to print list elements in different ways.
3. Program for Adding, removing elements in the list.
4. Program to print a list using 'FOR and IN' loop.
5. Program to add an element at specified index in a list.
6. Program to remove first occurrence of a given element in the list.
7. Remove all occurrences a given element from the list.
8. Program to remove all elements in a range from the List.
9. Program to Print the index of first matched element of a list.
10. Convert a string to integers list.
11. Input comma separated elements, convert into list and print.
12. Program to find the position of minimum and maximum elements of a list.
13. Program to input, append and print the list elements.
14. Program to sort the elements of given list in Ascending and Descending Order.
15. Program to find the differences of two lists.
16. Program to Create two lists with EVEN numbers and ODD numbers from a list.
17. Program to print all numbers which are divisible by M and N in the List.
18. Program to remove duplicate elements from the list.
19. Create a list from the specified start to end index of another list.
20. print list after removing EVEN numbers.
21. Iterate a list in reverse order.
22. Create three lists of numbers, their squares and cubes.
23. Create two lists with first half and second half elements of a list.
24. print list after removing ODD numbers.

Assignment 7

Objective:

- To make the student understand the use function
- To make the student understand the parameters passing as reference and value.
- To make the student understand the return from the function

Programs:

1. Create a function to print your name using Python.
2. Write a program to add two integers using function.
3. Create a function to multiply two numbers and the numbers should pass as parameter and return the result.
4. Write a Python program to access a function inside a function.
5. Write a Python program to understand the use of *global* and *nonlocal* variables declared in a function.
6. Write a Python program to understand the use of asterisk(*) character declared in a function.
7. Write a Python program to understand the use of double asterisk(*) character declared in a function.
8. Create a function to calculate and return LCM of two numbers.
9. Create a function to calculate and return HCF of two numbers.
10. Write a Python function to find the max of three numbers.
11. Write a Python function to sum all the numbers in a list.
12. Write a Python function to multiply all the numbers in a list
13. Write a Python program to reverse a string.
14. Write a Python function to calculate the factorial of a number (a non-negative integer). The function accepts the number as an argument.
15. Write a Python function to check whether a number falls in a given range.
16. Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.
17. Write a Python function that takes a list and returns a new list with unique elements of the first list.
18. Write a Python function that takes a number as a parameter and check the number is prime or not.
19. Write a Python program to print the even numbers from a given list.
20. Write a Python function to check whether a number is perfect or not.
21. Write a Python function that checks whether a passed string is palindrome or not.
22. Write a Python function to create and print a list where the values are square of numbers between 1 and 30 (both included)