 **LABSHEET-3**

**WORKING WITH FOR LOOP**

## Looping:

Looping is nothing but executing same set of instructions multiple times till some condition is satisfied.

While analyzing the problem, following things need to be identified

1. Initial value/ initialization
2. Condition
3. Updation
4. Statement to be executed multiple times

3 types of loops:

1. while
2. for
3. do while

# Using for loop:

**Syntax**

**for (initial value; condition; Updation**)

{

Statements to be executed

}

**Problem 1:** Suppose Hari wants to display presidency university multiple times. Write

aprogram to help him to perform this task using do while loop*.*

#include <stdio.h> //Header file

void main() //main function

{

int n=0,i=1; //Declaring the variable n and i

printf("Enter the number of times the display message need to be printed\n"); //Display message

scanf("%d",&n); //Reading n value from keyboard

do

{

printf("Presidency university\n"); //Printing the message

i=i+1;

}

while(i<=n);

}

### Problem 2:

The continuous evaluations such quiz, Test1, Test2, …. etc. are conducted in Computer Programming course. The maximum time to each evaluation is fixed by the teacher. Students are expected to stop writing the evaluation components as soon as the maximum time fixed for evaluation is complete.

A software to simulate the stop watch need to be developed with following requirements using for loop.

1. The maximum time for evaluation to be captured. It is a number which may signify second or minute or hour.
2. The time should be decremented by one unit each time.
3. When the time is elapsed i.e. when time is zero, a message should be displayed “Stop the Evaluation”.

### #include <stdio.h> //Header file

### void main() //main function

### {

### int n,i; //Declaring the variable n and i

### printf("Enter the time limit for test in minutes"); //Display message

### scanf("%d",&n); //Reading n value from keyboard

### for(i=n;i>=0;i--) // loop will execute n number of times

### {

### if(i==0) //when time become zero this statement will execute

### {

### printf("stop the evaluation"); //Display the stop message

### break;

### }

### printf("continue with evaluation:\n"); //Display message to continue

### }

### }

### Problem 3:

Radha has bought 5 books for reference to prepare for her semester exams. She has studied in mathematics course that the factorial of n items gives the number of ways that she can use to arrange the n items. Radha would like to know in how many ways she can arrange the five books that she has bought

Following are requirements to solve the problem using for loop

1. Number of books has to be captured
2. The books should be arranged starting from the first book and then the second book so on
3. Finally, the total number of ways in which her books can be arranged should be displayed.

#include <stdio.h> //Header file

void main() //main function

{

int n,i,fact=1; //Declaring the variable n ,i , Fact

printf("Enter the number of textbooks"); //Display message

scanf("%d",&n); //Reading n value from keyboard

for(i=1;i<=n;i++)

{

fact=fact\*i; //Logic to find factorial number

}

printf("The number of ways the text book can be arranged is %d", fact); //Displaying total number of ways

}

### Problem 4:

You work for a company which pay X as your salary. Annual revision of your salary will be based on your effort which is measured as Y. Where Y values are in the scale 1-10. New salary is an exponential growth of your salary over effort. A software need to be developed to compute your new salary with following requirement using for loop.

1. Current Salary X need to be captured.
2. Effort Y need to be captured
3. New salary Z to be computed as XY
4. Display new salary

#include <stdio.h> //Header file

void main() //main function

{

int x,y,z=1,i; //Declaring the variable x,y,z

printf("Enter the present salary:\n"); //Display message

scanf("%d",&x); //Reading x value from keyboard

printf("Enter the effort in the range of 1 to 10:\n"); //Display message

scanf("%d",&y); //Reading y value from keyboard

for(i=0;i<y;i++)

{

z=z\*x;

}

printf("The new salary is %d", z); //Displaying new salary

}

### Problem 5:

Mr Suraj bought a new car. He wants to get it registered in RTO office. Mr Suraj thinks that a registration number whose sum of digits is odd will be lucky for him. RTO has given him option to choose the number from the pool of numbers. Mr. Suraj want to check when he adds all the digits in the number if he gets odd number or even.

A software need to be developed with following requirements using while loop:

1. The number should be captured from the user.
2. Extract each digit from the number.
3. Add the digits to form new number.
4. Check and Display if the new number is even or odd.

void main()

{

int num,temp,cur\_digit,sum=0; //Declaring variables

printf("Enter the number"); //Entering the digit for number plate

scanf("%d",&num); //Reading number

temp=num; // Storing num in temporary variable

while(temp>0){

cur\_digit=temp%10;

temp=temp/10;

sum=sum+cur\_digit;

}

printf("The sum is %d\n", sum);

if((sum%2)==0) // condition to check odd or even

{

printf("The sum of numbers is even :\n");

}

else

printf("The sum of numbers are odd:\n");

}

**Exercise Questions:**

1. Rahul wants to find the cube of integers. Help him to develop a program in C to display the cube of the number up to given an integer using for loop.

Test Data :  
Input number of terms : 5  
*Expected Output* :  
Number is : 1 and cube of the 1 is :1  
Number is : 2 and cube of the 2 is :8  
Number is : 3 and cube of the 3 is :27  
Number is : 4 and cube of the 4 is :64  
Number is : 5 and cube of the 5 is :125

1. Hari wants to generate the multiplication table of an integer number. Help him to develop a program in C to display the multiplication table of a given integer using for loop.    
   Test Data :  
   Input the number (Table to be calculated) : 15  
   *Expected Output* :  
   15 X 1 = 15  
   ...  
   ...  
   15 X 10 = 150
2. Rahul wants to display the n terms of odd natural number and calculate their sum. Help him to develop a program in C to perform the task using for loop.

Test Data  
Input number of terms : 10  
*Expected Output* :  
The odd numbers are :1 3 5 7 9 11 13 15 17 19  
The Sum of odd Natural Number up to 10 terms : 100