

## **Task 1:**

Write a program to ask user input START/END and iterate loop from start to end and perform following tasks:

- a) Print numbers using FOR/WHILE/DO WHILE.
- b) Test on following values and observe output (You may be asked anytime during lab regarding this observation)
- c) While testing on last two inputs, it may work abnormally. Now modify above program so that it should work t time where t is difference between start/end.
- d) How for/while/do-while loop behaves?

## **Solution:**

```
#include<iostream>
using namespace std;
int main(){

    int startValue,endValue;
    int i,k=1;
    cout<<"Enter Start Value: ";
    cin>>startValue;
    cout<<"Enter End Value: ";
    cin>>endValue;
    int j = endValue - startValue;
    if(j>0)
        cout<<"The difference between numbers is "<< j<<" , Therefore, your program
will run "<<j<<" times"<<endl<<endl;
    while(k<=j){
        for(i = startValue; i<endValue; i++){
            cout<<i<<" ";
        }
        cout<<endl;
        k++;
    }
    cout<<endl;
    system("PAUSE");
    return 0;}
```

## Output:

```
Enter Start Value: 2
Enter End Value: 9
The difference between numbers is 7, Therefore, your program will run 7 times

2 3 4 5 6 7 8
2 3 4 5 6 7 8
2 3 4 5 6 7 8
2 3 4 5 6 7 8
2 3 4 5 6 7 8
2 3 4 5 6 7 8
2 3 4 5 6 7 8
```

## Task 2:

Write a program to ask user input n\_courses (Total Courses), then iterate loop n\_courses time and ask user marks in each course and perform following tasks:

- Calculate average of all courses marks.
- Calculate total percentage of all courses.
- Tell the user whether s/he is PASS/FAIL, FAIL  $\diamond$  less than 60, and otherwise PASS.

## Solution:

```
#include<iostream>
using namespace std;
int main(){
    int i=1,nCourse,num=1;
    float average,percentage,marks,totalMarks=0;
    cout<<"Enter number of courses you have done... ";
    cin>>nCourse;
    while(i<=nCourse){
        cout<<"Enter Marks of course "<<num<<" : ";
        cin>>marks;
        totalMarks+=marks;
        num++;
        i++;
    }

    cout<<endl;
    average = totalMarks/nCourse;
    cout<<"Your Average score is :"<<average<<endl;
    percentage= (totalMarks/(nCourse*50))*100;
    cout<<"Your Percentage is :"<<percentage<<endl;

    if(percentge >=60)
    cout<<"Congrats! You have passed the exam...";
    else
    cout<<"Bad Luck! You are fail...";

    cout<<endl;cout<<endl;
    system("PAUSE");
    return 0;
}
```

## Output:

```
Enter number of courses you have done... 3
Enter Marks of course 1 : 34
Enter Marks of course 2 : 45
Enter Marks of course 3 : 43

Your Average score is :40.6667
Your Percentage is :81.3333
Congrats! You have passed the exam...
```

### Task 3:

Write a program to output the N terms of HARMONIC series and their SUM.

Input:5

Output:  $1/1 + 1/2 + 1/3 + 1/4 + 1/5$

Total Sum is: 2.28333

### Solution:

```
#include<iostream>
using namespace std;
int main(){
    int i=1,nTerms;
    float sum=0,totalSum=0;
    cout<<"Enter number of terms: ";
    cin>>nTerms;

    while(i<=nTerms){
        cout<<"1/"<<i<<" ";
        sum = 1.0/i;
        totalSum += sum;
        i++;
        if(i<=nTerms)
            cout<<" + ";
    }

    cout<<endl;
    cout<<"The sum of terms is: "<<totalSum;

    cout<<endl;
    system("PAUSE");
    return 0;
}
```

### Output:

```
Enter number of terms: 5
1/1 + 1/2 + 1/3 + 1/4 + 1/5
The sum of terms is: 2.28333
```

## Task 4:

Write a program to ask user NAME and print “Welcome Dear NAME”, then ask user whether user wants to continue or exit (y ◊ continue, e ◊ exit). Print appropriate message to tell user how to EXIT/CONTINUE.

Note: In following each task, you have to ask user whether CONTINUE/EXIT, if continue then program should RUN AGAIN otherwise TERMINATE.

## Solution:

```
#include<iostream>
#include<string>
using namespace std;
int main(){
    string name;
    char decision;
    while(true){
        cout<<"Enter your name: ";
        cin>>name;
        cout<<"welcome dear "<<name<<endl;
        cout<<"Do you want to continue (y/n): ";
        cin>>decision;
        if (decision=='n')
            break;
    }

    cout<<endl;
    system("PAUSE");
    return 0;
}
```

## Output:

```
Enter your name: kamran
Welcome dear kamran
Do you want to continue (y/n): y
Enter your name: ali
Welcome dear ali
Do you want to continue (y/n): n
```

## Task 5:

Write a program to ask user input N and perform following tasks: a) Check whether N is PRIME/NOT?

## Solution:

```
#include <iostream>
#include <cmath>
using namespace std;

int main() {
    int num,i,count=0;
    cout << endl;
    cout << "Enter number: ";
    cin >> num;

    if (num <= 1) {
        cout << "Not Prime number";
    }
    else {

        for (i = 2; i <= sqrt(num); i++) {
            if (num % i == 0) {
                cout << "Not Prime number";
                break;
            }
        }

        if (i > sqrt(num)) {
            cout << "Prime number";
        }
    }

    cout << endl;
    system("PAUSE");
    return 0;
}
```

## Output:

```
Enter number: 5
Prime number
Press any key to continue . . . |
```

## Task 6:

Write a program to ask user input N and perform following tasks:

- a) Check whether N comes in FIBONACCI series or NOT?
- b) Generate FIBONACCI series till N.

Note: FIBONACCI series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55...

## Solution:

```
#include <iostream>
using namespace std;

int main() {
    int n;
    bool found= false;
    cout << "Enter number: ";
    cin >> n;

    int fib[n+5];

    fib[0] = 0;
    fib[1] = 1;

    for (int i = 2; i < (n+5); i++) {
        fib[i] = fib[i - 1] + fib[i - 2];
    }
    for (int i = 0; i < (n+5); i++) {
        if(fib[i]==n){
            found = true;
        }
    }
    if(found==true)
        cout<<"This number is INCLUDED in fibancci series";
    else
        cout<<"This number is NOT INCLUDED in fibancci series";

    cout<<endl;
    system("PAUSE");
    return 0;
}
```

## Output:

```
Enter number: 35
This number is NOT INCLUDED in fibancci series
Press any key to continue . . . |
```

## Task 7:

Write a program to ask user input N and design following patterns: Input N = 5

Output:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

## Solution:

```
#include<iostream>
using namespace std;
int main(){
    int num;
    cout<<"Enter number: ";
    cin>>num;

    for( int i = 1; i<=num; i++){
        for (int j = 1; j <= i; j++) {
            cout << j << " ";
        }
        cout<<endl;
    }
    int i=0;
    while(i<=num){
        for (int j =65; j<65+i;j++){
            cout<<(char)j << " ";
        }
        i++;
        cout<<endl;    }

    cout<<endl;
    system("PAUSE");
    return 0;}
```



Output:

```
Enter number: 7
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
1 2 3 4 5 6
1 2 3 4 5 6 7

A
A B
A B C
A B C D
A B C D E
A B C D E F
A B C D E F G
```