CHANDIGARH UNIVERSITY
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EXPERIMENT NO: 1.1

STUDENT'S NAME : Ankush Singh	**SUBJECT : OOPs in C++**
STUDENT'S UID : 22BCT10002	**SEMESTER : 2**
SECTION AND GROUP : 22BCB123 A	

AIM OF THE EXPERIMENT-

1. WAP to find average marks of N subjects of a student in a class.

FLOWCHART/ALGORITHM -

1. START;
2. Define a variable- number of subjects and total- sum of marks to 0;
4. Start a loop from 1 to N and keep asking for marks, add it to total;
5. find average marks by dividing the total with N;
5. Print average as output;

PROGRAM CODE:

```
#include <iostream>
using namespace std;
int main(){
   int subjects, i;
   float marks, total=0.0f, averageMarks, percentage;
   // Input number of subjects
   cout << "Enter number of subjects\n";
   cin >> subjects;
   // Take marks of subjects as input
   cout << "Enter marks of subjects\n";
   for(i = 0; i < subjects; i++){
      cin >> marks;
      total += marks;
   }
   // Calculate Average
   averageMarks = total / subjects;
   cout << "Total Marks = "<< total;
   cout << "\nAverage Marks = "<< averageMarks;
   return 0;
}
```

PROGRAM'S EXPLANATION(in brief):

The program starts by defining variables marks, total, average and percentage and number of subjects. We start a loop and ask the user for marks and keep adding it. After the loop we divide the total by number of subjects and calculate the average and percentage and show it as output;

OUTPUT:

```
Enter number of subjects
5
Enter marks of subjects
50
60
70
80
90
Total Marks = 350
Average Marks = 70
```

AIM 2: WAP to swap first and last digits of any number

ALGORITHM:

1.START;
2. Define an int variable and ask for input;
3. Convert the int to string, swap 0 and length-1 characters;
4. Display result;

PROGRAM CODE:

```
#include <iostream>
using namespace std;
int main() {
  int number;
  cout << "Enter a number: ";
  cin >> number;
  string ns = to_string(number);
  int length = ns.length();
  char temp = ns[0];
  ns[0] = ns[length - 1];
  ns[length - 1] = temp;
  cout << "Number after swapping first and last digit is " << ns << endl;
  return 0;
}
```

EXPLANATION: We input a number, convert it to a string swap first and last position and display the output.

OUTPUT:

```
Find the number after swapping the first and last digits:
--------------------------------------------------------
Input any number: 12345
The number after swaping the first and last digits are: 52341
```

AIM 3 : WAP to generate the Fibonacci series up to user specified limit. Write all the missing terms (e.g. 4, 6, 7, 9, 10, 11, 12, 14, 15…) also at the end.

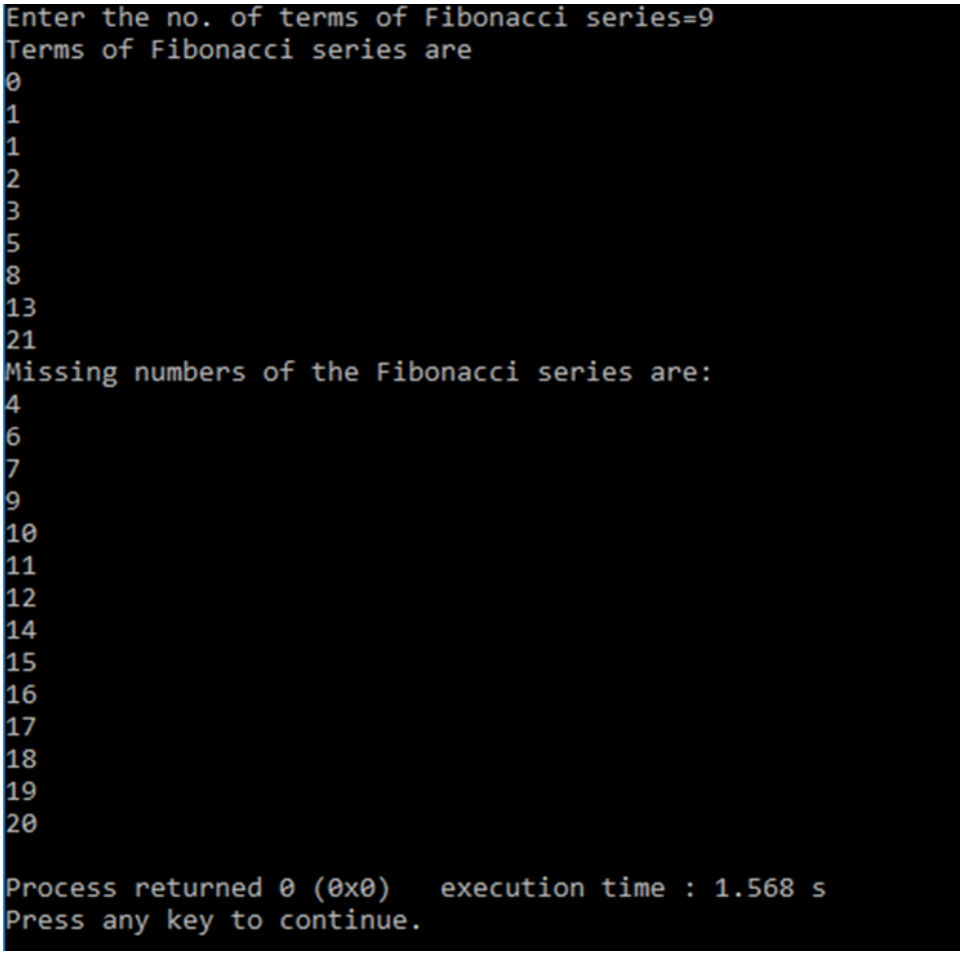
ALGORITHM:

1. Define variables, nc, first=0, second=0, next, an int array, and count;
2. input the number of digits we want;
3. generate fibonacci numbers in a loop and print them;
4. In the loop find the missing numbers and keep storing them in an array;
5. After the loop print all the missing numbers;

PROGRAM CODE:

```
#include<iostream>
using namespace std;
int main()
{
        int n,c,first=0,second=1,next;
        int a[20],i,j=0,count=0;
        cout<<"Enter the no. of terms of Fibonacci series=";
        cin>>n;
        cout<<"Terms of Fibonacci series are"<<endl;
        for(c=0;c<n;c++)
        {
                if(c<=1)
                        next=c;
                else
                {
                        next=first+second;
                        first=second;
                        second=next;
                }
                cout<<next<<endl;
                if(next-first>1)
                {
                        for(i=first+1; i<next; i++)
                        {
                                a[j]=i;
                                count++;
                                j++;
                        }
                }
        }
        cout<<"Missing numbers of the Fibonacci series are:"<<endl;
        for(j=0; j<count; j++)
                cout<<a[j]<<endl;
        return 0;
}
```

OUTPUT:


Enter the no. of terms of Fibonacci series=9
Terms of Fibonacci series are
0
1
1
2
3
5
8
13
21
Missing numbers of the Fibonacci series are:
4
6
7
9
10
11
12
14
15
16
17
18
19
20
Process returned 0 (0x0) execution time : 1.568 s
Press any key to continue.

LEARNING OUTCOMES

- Remember the concepts related to fundamentals of C language, draw flowcharts and write algorithm/pseudocode.
- Understand the way of execution and debug programs in C language.
- Apply various constructs, loops, functions to solve mathematical and scientific problem.
- Analyze the dynamic behavior of memory by the use of pointers.
- Design and develop modular programs for real world problems using control structure and selection structure.

EVALUATION COLUMN (To be filled by concerned faculty only)

Sr. No.	Parameters	Maximum Marks	Marks Obtained
1.	Worksheet Completion including writing learning objective/ Outcome	10	
2.	Viva	8	
3.	Conduct	12	
4.	Total Marks	30	