```
/*
 * Problem Statement :- Write a program non-recursive and recursive program to
calculate
 *                      Fibonacci numbers and analyze their time and space complexity.
 *
 * Recursive
 * Time Complexity  : O(2^n)
 * Space Complexity : O(n)
 *
 * Non-Recursive
 * Time Complexity  : O(n)
 * Space Complexity : O(1)
 */

#include<bits/stdc++.h>
using namespace std;

int recursive_fibonacci(int n)
{
      if(n==1 || n==0) return n;
      return recursive_fibonacci(n-1) + recursive_fibonacci(n-2);
}

int non_recursive_fibonacci(int n)
{
      if(n==1 || n==0) return n;
      int a=0, b=1, c;

      for(int i=2; i<=n; i++)
      {
            c = a+b;
            a = b;
            b = c;
      }
      return c;
}

int main()
{
      int n, choice;

      while(true)
      {
            cout<<"\n\n Main-Menu \n\t 1. Recursive \n\t 2. Non-Recursive \n\t 3. Exit
\n"<<endl;
            cout<<"\n\t Enter choice: ";
            cin>>choice;

            if(choice == 1)
            {
                  cout<<"\n\t Enter value of n to find nth fibonacci number(Fn) : ";
                  cin>>n;
                  int Fn = recursive_fibonacci(n);
                  cout<<"\n\t Value of F"<<n<<" = "<<Fn<<endl;
            }
            else if(choice == 2)
```

```
		{
			cout<<"\n\t Enter value of n to find nth fibonacci number(Fn) : ";
			cin>>n;
			int Fn = non_recursive_fibonacci(n);
			cout<<"\n\t Value of F"<<n<<" = "<<Fn<<endl;
		}
		else if(choice == 3)
		{
			cout<<"\n\t Thank You!!"<<endl;
			exit(0);
		}
		else
		{
			cout<<"\n\t Enter valid choice"<<endl;
		}
	}

}
```