**GANPAT UNIVERSITY**

**U. V. PATEL COLLEGE OF ENGINEERING**

**DEPARTMENT OF CE/IT**

**ACADEMIC YEAR: JAN - MAY 2021**

**Subject:** 2CEIT402: Design & Analysis of Algorithm **Sem/Branch:** B.Tech 4th (CE/IT/CE-AI)

**1. Implement functions to print nth Fibonacci number using iteration and recursive method. Compare the performance of two methods by counting number of steps executed on various inputs. Also draw a comparative chart. (Fibonacci series 1, 1, 2, 3, 5, 8….. Here 8 is the 6th Fibonacci number)**

**Code Of Iteration:**

#include <iostream> using namespace std;

int main() {

int first=0; int second=1; int n=40; printf("%d %d",0,1); for(int i=1;i<=n;i++)

{ int sum=first+second; printf("%d",sum); first=second; second=sum;

} return 0;

}

**Code Of Recursive**

#include <iostream> using namespace std; void fib(int n)

{ if(n==0) return; static int fir=0; static int sec=1; int sum=fir+sec; printf(" %d ",sum); fir=sec; sec=sum; n=n-1; fib(n); } int main() {

int n=3; printf(" %d %d",0,1);

fib(n); return 0;

}

**Table:**

|  |  |  |
| --- | --- | --- |
| **NO.** | **INTERATION** | **RECURSIVE** |
| 10 | 0.006945 | 0.007031 |
| 100 | 0.008090 | 0.007390 |
| 1000 | 0.008321 | 0.008452 |
| 10000 | 0.006860 | 0.008927 |
| 100000 | 0.007620 | 0.007574 |

**GRAPH COMPARISION**

**CONCLUSION**

1. **Best case :-** A1(iteration) its complexity is O(n).
2. **Worst case :-** A2(recursive) its complexity is O(2n).