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;
}
```

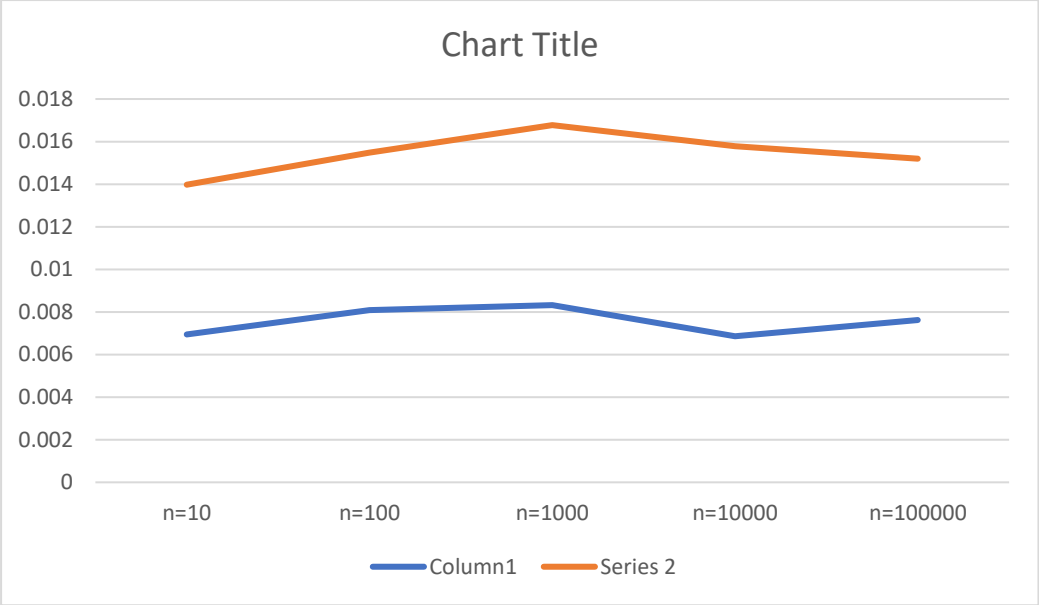
Code Of Recursive

```
#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).