
Lab-I
National Institute of Technology Silchar
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Subject Code: CS-201
Semester: 3rd
Course: B.Tech

Subject: Data Structures
Department: CSE
Section: A

You have to write the time complexities and space complexities in the lab copies for all questions.

1. Write a program to find n^{th} Fibonacci number. You have to compare the running time of the programs and draw a suitable bar chart.

- (a) Recursive method
- (b) Iterative method
- (c) Dynamic Programming
- (d) Matrix multiplication
- (e) Hashing method

Sample input:

Enter the total number counts: 10

Note: Take ten (10) random numbers less than 40.

Sample output

Elapsed time method 1: 1.2 seconds

Elapsed time method 2: 0.2 seconds

Elapsed time method 3: 0.2 seconds

Elapsed time method 4: 0.1 seconds

Elapsed time method 5: 0.002 seconds

2. Write a program to display the list of prime numbers from 2 to n.

- (a) Conventional Method
- (b) Sieve of Eratosthenes

3. Write a program to find the square root of a given number.

4. Write a program to compute the integer power—example power(n,e).

5. Find out the output of the following programs

(a)

```
#include <stdio.h>
void foo2(int);
void foo1(int n)
{
    if (n <= 10)
    {
```

```

        printf("%d\t", n);
        n++;
        foo2(n);
    }
}
void foo2(int n)
{
    if(n <= 10)
    {
        printf("%d\t", n);
        n++;
        foo1(n);
    }
}
int main()
{
    foo1(1);
}

(b) int foo1()
{
    static int n=100;
    if(n<=0)
        return 0;
    return n--;
}
int main()
{
    for(foo1();foo1();foo1())
        printf("%d\t",foo1());
    return 0;
}

(c) #include<stdio.h>
int f(int n)
{
    static int r=0;
    if(n<=0)
        return 1;
    if(n>3)
    {
        r=n;
        return f(n-2)+2;
    }
    return f(n-1)+r;
}
int main()
{
    printf("%d",f(5));
}

```