Name : Pratik Rajesh Jade

Roll no : A 70

Aim - Write C++ program to find factorial of a given number using

(i) Recursion (ii) Iteration Compare time and space complexity of both the designs.

*//Recursion*

#include<iostream>

using namespace std;

int factorial(int n);

int main() {

  int n;

  cout << "Enter a integer: ";

  cin >> n;

  cout << "Factorial of " << n << " = " << factorial(n);

  return 0;

}

int factorial(int n) {

  if(n > 1)

    return n \* factorial(n - 1);

  else

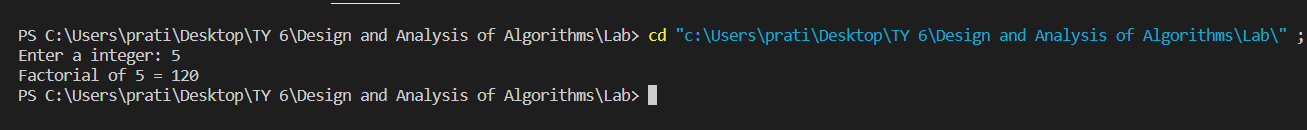
    return 1;

}

*// Time Complexity:Recursive: O(n)*

*// Space Complexity: Recursive: O(n)*

Output:



(ii) Iteration Compare time and space complexity of both the designs.

*//iteration*

#include <iostream>

using namespace std;

int factorial(int n) {

    int result = 1;

    for (int i = 1; i <= n; i++) {

        result \*= i;

    }

    return result;

}

int main() {

    int num;

    cout << "Enter a number: ";

    cin >> num;

    cout << "The factorial of " << num << " is " << factorial(num) << endl;

    return 0;

}

*// Time Complexity: Iterative: O(n)*

*// Space Complexity: Iterative: O(1)*

Output :

