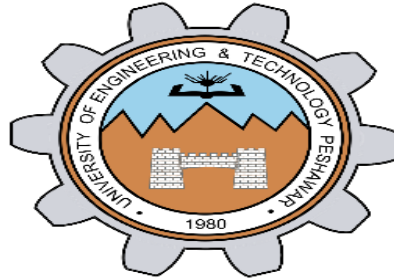


LAB REPORT NO 7



Spring 2020

CSE102L Computer Programming Lab

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Class Section: A

“On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

Submitted to:

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(July 16, 2020)

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1. Print 1 to 100 in C++ using recursion.

```
#include<iostream>

using namespace std;

int nat(int n);

int main(){

    int n=100;

    cout<<"Natural number from 1 to 100 is\n"<<endl;

    for(int i=1; i<=n; i++){

        cout<<" "<< nat (i);

    }

    return 0;

}

int nat(int n)

{

    return (n);

}
```

```
C:\Users\HP\Documents\sdw.exe
Natural number from 1 to 100 is
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62
63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92
93 94 95 96 97 98 99 100
-----
Process exited after 0.1175 seconds with return value 0
Press any key to continue . . .
```

2. Write a C++ program where you take two values from user if the user enter one or two of the values zero instead of passing the zero values to the function let the function calculate default values if user enters values other than zero pass them to function and calculate their sum.

```
#include<iostream>

using namespace std;

int sum(int x = 3, int y = 6);

main() {

    int a, b;

    cout<<"Entre a number";

    cin>>a;
```

```
cout<<"Entre another number: ";
```

```
cin>>b;
```

```
if((a==0)&&(b==0)) {
```

```
    cout<<sum();
```

```
}else if((a==0) || (b==0)) {
```

```
    if(a==0) cout<<sum(b);
```

```
    else cout<<sum(a);
```

```
}else {
```

```
    cout<<sum(a,b);
```

```
}
```

```
}
```

```
int sum(int x, int y) {
```

```
    return x + y;
```

```
}
```

```
C:\Users\HP\Documents\aadssa.exe
Entre a number12
Entre another number: 32
44
-----
Process exited after 5.146 seconds with return value 0
Press any key to continue . . .
```

3. Write a function to find Sum of N natural numbers using Recursion.

```
#include<iostream>

using namespace std;

int add(int n);

int main(){

    int n;

    cout<<"Enter no of natural number\n ";

    cin>>n;

    cout<<"\nSum of first "<<n<<" natural is ";

    cout<<add(n);


    return 0;

}

int add(int n)

{

    if (n!=0)

        return n +add(n-1);

    return 0;

}
```

```
Enter no of natural number
23
Sum of first 23 natural is 276
Process exited after 5.58 seconds with return value 0
Press any key to continue . . .
```

4. Calculate the sum of odd natural numbers $1+3+5+7+\dots + n$ using Recursion.

Take n as input from user.

```
#include<iostream>

using namespace std;

int addodd(int n);

int main(){
    int n;

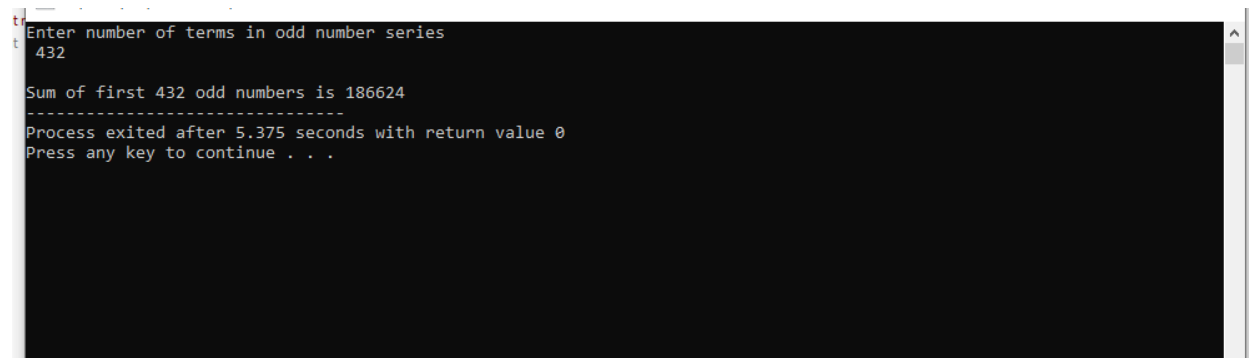
    cout<<"Enter number of terms in odd number series\n ";
    cin>>n;

    cout<<"\nSum of first "<<n<<" odd numbers is ";
    cout<<addodd(n);

    return 0;
}

int addodd(int n)
{
    if (n==1)
```

```
        return (1);  
    else  
    return (addodd(n-1)+(2*n-1));  
  
}
```



```
Enter number of terms in odd number series  
432  
  
Sum of first 432 odd numbers is 186624  
-----  
Process exited after 5.375 seconds with return value 0  
Press any key to continue . . .
```

5. Overload three functions with name grade() one function should accept marks(int) and output the percentage and the other function should accept the percentage(float) and display the grade based on the percentage from previous function finally the third function also named grade should make a call to these other two functions

```
#include<iostream>
```



```
using namespace std;

int marks;

void grade();

float grade(int a);

char grade(float b);

main() {

    cout<<"Enter numbers: ";

    cin>>marks;

    grade();

}
```

```
float grade(int a) {

    float p = (float) a/1000;

    p*=100;

    return p;

}
```

```
char grade(float b) {

    if(b > 90) {

        return 'A';

    }

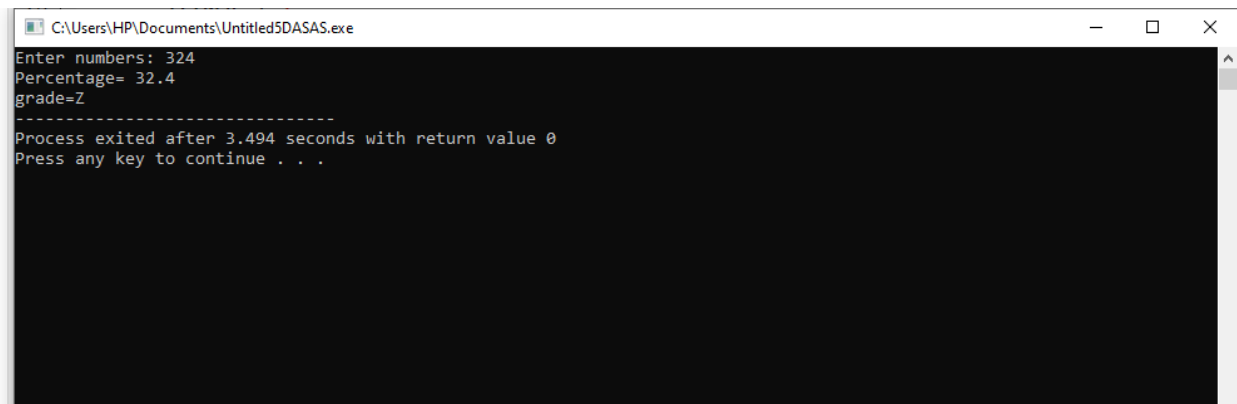
}
```

```

    }else if(b > 80) {
        return 'B';
    }else if(b > 70) {
        return 'C';
    }else if(b > 60) {
        return 'D';
    }else if(b > 50) {
        return 'E';
    }else if(b > 40) {
        return 'G';
    }else if(b > 30) {
        return 'Z';
    }else {
        return 'F';
    }
}

void grade() {
    float per = grade(marks);
    char gr = grade(per);
    cout<<"Percentage= "<<per<<"\ngrade="<<gr;
}

```



```
C:\Users\HP\Documents\Untitled5DASAS.exe
Enter numbers: 324
Percentage= 32.4
grade=Z
-----
Process exited after 3.494 seconds with return value 0
Press any key to continue . . .
```

6. Write a C++ Program to Find Factorial of a Number Using Recursion.

```
#include <iostream>

using namespace std;

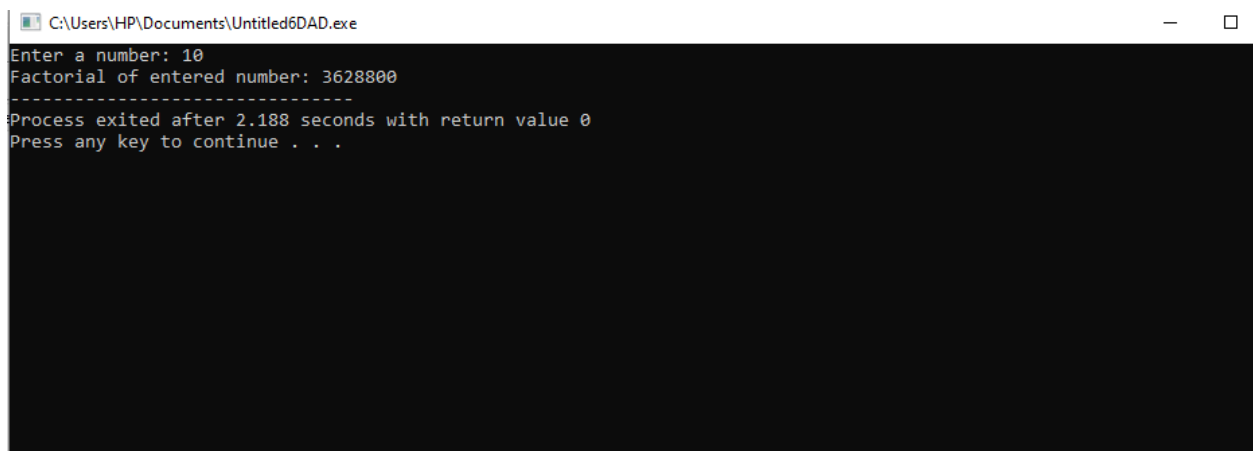
//Factorial function
int f(int n){
```

```

/* This is called the base condition, it is
* very important to specify the base condition
* in recursion, otherwise your program will throw
* stack overflow error.
*/
if (n <= 1)
    return 1;
else
    return n*f(n-1);
}

int main(){
    int num;
    cout<<"Enter a number: ";
    cin>>num;
    cout<<"Factorial of entered number: "<<f(num);
    return 0;
}

```



```

C:\Users\HP\Documents\Untitled6DAD.exe
Enter a number: 10
Factorial of entered number: 3628800
-----
Process exited after 2.188 seconds with return value 0
Press any key to continue . . .

```

7. C++ Program to Find L.C.M Using Recursion.

```
#include <iostream>

using namespace std;

int lcm(int x, int y) ;

int main(){

    int x,y;

    cout<<"Enter two numbers\n";

    cin>>x>>y;

    cout<<"LCM of "<<x<<" and "<<y<<" is equal to "<<lcm(x,y)<<endl;

    return 0;

}

int lcm(int x, int y){

    static int m=0;

    m=m+y;

    if((m%x==0)&& (m%y==0))

    {

        return m;

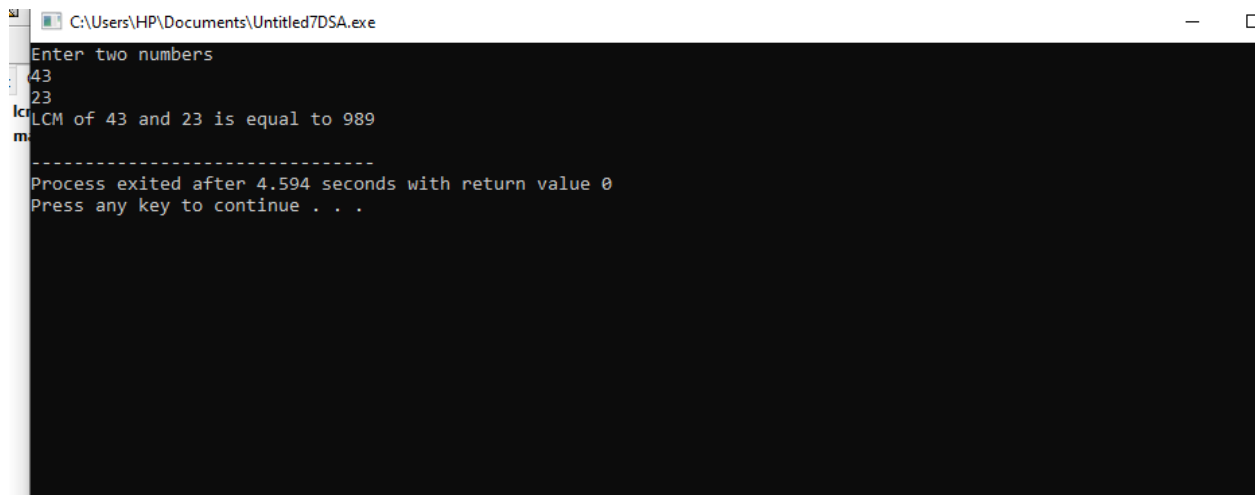
    }

    else{

        return lcm(x,y);

    }

}
```



```
C:\Users\HP\Documents\Untitled7DSA.exe
Enter two numbers
43
23
LCM of 43 and 23 is equal to 989
-----
Process exited after 4.594 seconds with return value 0
Press any key to continue . . .
```

8. C++ program to print Fibonacci series using recursion.

```
#include <iostream>

using namespace std;

int fabo(int x) {
    if((x==1) || (x==0)) {
        return(x);
    }else{
        return (fabo(x-1)+fabo(x-2));
    }
}

int main(){

    int x;

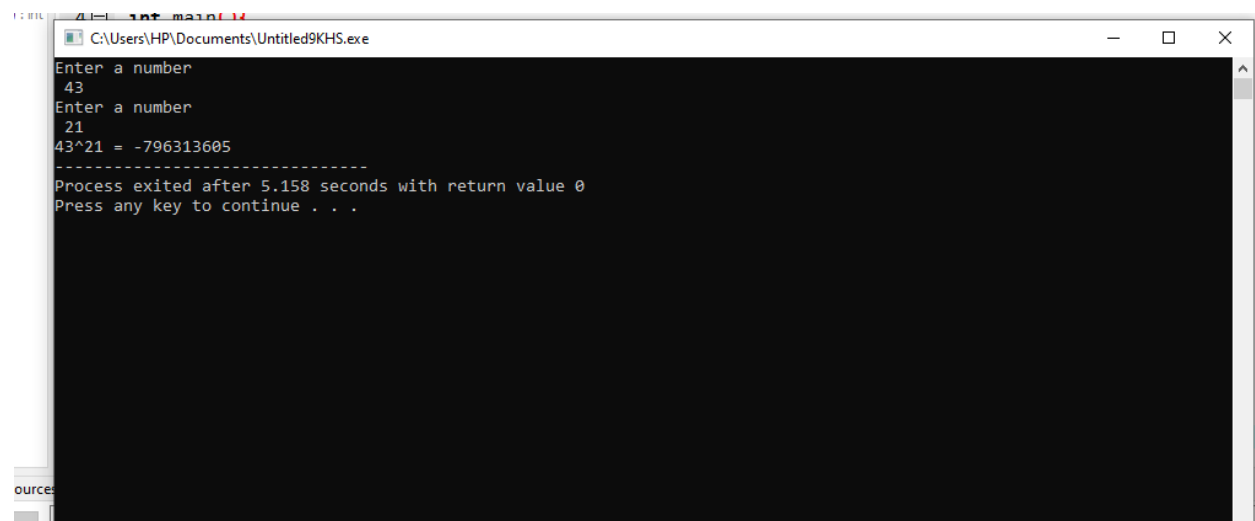
    cout<<"Enter term of fabonacii series\n";
    cin>>x;
```

```
C:\Users\j\if (Documents)\Untitled00000000.exe
Enter term of fabonacii series
13
Fabonacii series is :
0 1 1 2 3 5 8 13 21 34 55 89 144
-----
Process exited after 3.268 seconds with return value 0
Press any key to continue . . .
```

```

cin>>x;
cout<<n<<"^"<<x<<" = ";
    cout<<pow(n,x);
return 0;
}
int pow(int n ,int x)
{
    if (x==0)
return (1);
    else
        return n*pow(n,x-1);
}

```



```

C:\Users\HP\Documents\Untitled9KHS.exe
Enter a number
43
Enter a number
21
43^21 = -796313605
-----
Process exited after 5.158 seconds with return value 0
Press any key to continue . . .

```