National University
of computer and emerging sciences

DS LAB 3 ACTIVITY

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TASK – 01(a):

Task 3.cpp | Task 5.cpp | Task 4.cpp | Task 1(a).cpp | Task 1(b).cpp | Task 2(a).cpp | Task 2(b).cpp

```cpp
#include <iostream>
using namespace std;

//int func(int n1, int n2)
//{
//  if(n1==22)
//  {
//      return n1;
//  }
//
//  else{
//      cout<<n1<<" , ";
//      n1=n1+n2;
//      n2++;
//      return func(n1,n2);
//  }
//}
//
//
//int main()
//{
//  cout<<func(1,0);
//}

int func(int n1, int n2, int i)
{
    if(n2==i-1)//0==3-1----1==3-1---2==3-1//true
    {
        return n1;//last wala matlab 2
    }

    else{
        cout<<n1<<" , ";//1---1
        n1=n1+n2;//1=1+0=1---2
        n2++;//n2=1---2
        return func(n1,n2,i);//n1=1,n2=1,i=3----n1=2,n2=2,i=3
    }
}

int main()
{
    int i;
    cout<<"Enter number: ";
    cin>>i;
    cout<<func(1,0,i);
}
```

```
D:\Data Structures\lab 3\Task 1(a).exe
Enter a number: 7
1 , 3 , 6 , 10 , 15 , 21 , 28
--------------------------------
Process exited after 3.229 seconds with
Press any key to continue . . .
```

TASK – 01(b):

Task 3.cpp | Task 5.cpp | Task 4.cpp | Task 1(a).cpp | Task 1(b).cpp | Task 2(a).cpp | Task 2(b).cpp

```cpp
#include <iostream>
using namespace std;

//int func(int n1, int n2)
//{
//  if(n1==22)
//  {
//      return n1;
//  }
//
//  else{
//      cout<<n1<<" , ";
//      n1=n1+n2;
//      n2++;
//      return func(n1,n2);
//  }
//}
//
//
//int main()
//{
//  cout<<func(1,0);
//}

int func(int n1, int n2, int i)
{
    if(n2==i-1)//0==3-1----1==3-1---2==3-1//true
    {
        return n1;//Last wala matlab 2
    }

    else{
        cout<<n1<<" , ";//1---1
        n1=n1+n2;//1=1+0=1---2
        n2++;//n2=1---2
        return func(n1,n2,i);//n1=1,n2=1,i=3----n
    }
}

int main()
{
    int i;
    cout<<"Enter number: ";
    cin>>i;
    cout<<func(1,0,i);
}
```

D:\Data Structures\lab 3\Task 1(b).exe

```
Enter number: 8
1 , 1 , 2 , 4 , 7 , 11 , 16 , 22
--------------------------------
Process exited after 1.105 seconds with retu
Press any key to continue . . .
```

TASK – 02(a):

Task 3.cpp | Task 5.cpp | Task 4.cpp | Task 1(a).cpp | Task 1(b).cpp | Task 2(a).cpp | Task 2(b).cpp

```cpp
#include<iostream>
using namespace std;

int func1(int,int,int);
int func2(int,int,int);

int func1(int a,int n,int i)
{
    if(i==n)
    {
        return a;//ye a last value print kar raha kyun k i==n hogaya or line 16 main pehle hi a ko assig
    }


    else
    {
        cout<<a<<" , ";
        i++;
//      a=a+i;
        func2(a , n , i);
    }
}

int func2(int a,int n,int i)
{
    a=a+i;
    func1(a, n , i);
}


int main()
{
    int x,i=1;
    cout<<"Enter a number: ";
    cin>>x;
    cout<<func1(1,x,i);
}




//#include<iostream>
//using namespace std;
//
```

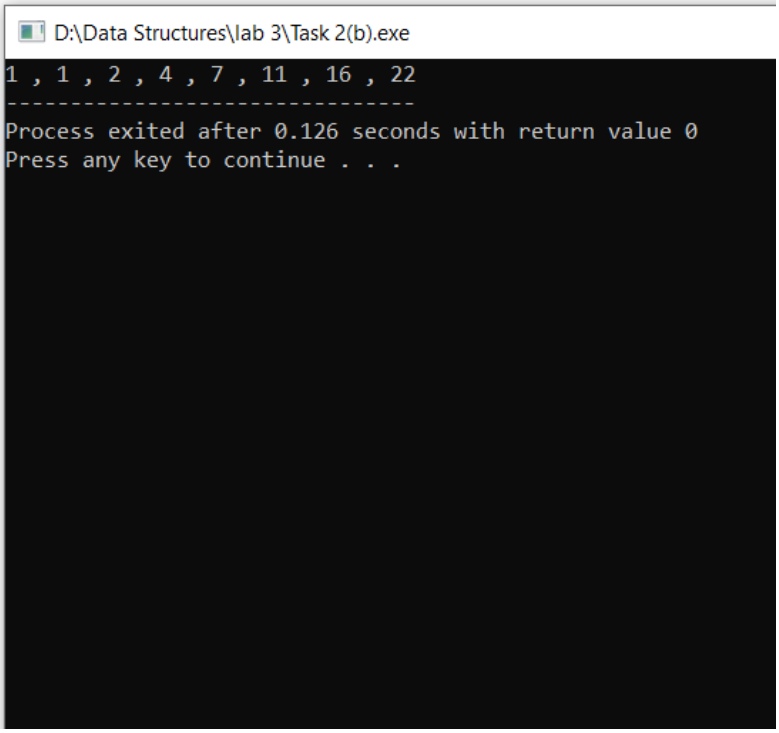
D:\Data Structures\lab 3\Task 2(a).exe

```
Enter a number: 7
1 , 3 , 6 , 10 , 15 , 21 , 28
--------------------------------
Process exited after 1.896 seconds with return value 0
Press any key to continue . . .
```

TASK – 02(b):

Task 3.cpp | Task 5.cpp | Task 4.cpp | Task 1(a).cpp | Task 1(b).cpp | Task 2(a).cpp | Task 2(b).cpp

```cpp
#include <iostream>
using namespace std;

int func2(int ,int);

int func1(int n1, int n2)
{
    if(n1==22)
    {
        return n1;
    }

    else{
        cout<<n1<<" , ";
//      n1=n1+n2;
//      n2++;
        func2(n1,n2);
    }
}


int func2(int n1, int n2)
{
    n1=n1+n2;
    n2++;
    func1(n1,n2);
}


int main()
{
    cout<<func1(1,0);
// cout<<func2(1,0);
}
```



TASK - 03:

Task 3.cpp | Task 5.cpp | Task 4.cpp | Task 1(a).cpp | Task 1(b).cpp | Task 2(a).cpp | Task 2(b).cpp

```cpp
#include<iostream>
using namespace std;

int* sorting(int *n,int i,int j)
{
    int temp;
    if(i==6)
        return n;
    else{
        if(j==5)
        {
            j=0;i++;
            sorting(n,i,j);
        }
        else{
            if(n[j]>n[j+1]){
                temp=n[j];
                n[j]=n[j+1];
                n[j+1]=temp;
            }
        }
        j++;
        sorting(n,i,j);
    }
}
int main()
{
    int array[6]={12,11,13,5,6,7};
    sorting(array,0,0);
    for(int i=0;i<6;i++)
    {
        cout<<array[i]<<" ";
    }
}
```

```
D:\Data Structures\lab 3\Task 3.exe
5 6 7 11 12 13
--------------------------------
Process exited after 0.1026 seconds with return
Press any key to continue . . .
```

TASK - 04:

Task 3.cpp | Task 5.cpp | Task 4.cpp | Task 1(a).cpp | Task 1(b).cp

```cpp
#include<iostream>
using namespace std;

int fun(int n)
{
    if(n>100)
        return n-10;

    return fun(fun(n+11));

//  fun(95)
//
//  retrun fun(fun(95+11))
//
//              106-10=96
//
//              fun(96)
//              fun(fun(96+11))
//              fun(97)
//              fun(fun(97+11))
//              fun(98)
//              fun(fun(98+11))
//              fun(99)
//              fun(fun(99+11))
//              fun(100)
//              fun(fun(100+11))
//              fun(111)
}

int main()
{
    int r;
    r=fun(95);
    cout<<""<<r;

    return 0;
}
```

TASK – 05 (a) & (b):

Task 3.cpp | Task 5.cpp | Task 4.cpp | Task 1(a).cpp | Task 1(b).cpp | Task 2(a).cpp | Ta

```
16      return true;}
17
18      return false;
19  }
20  bool mazecal(int maze[n][n],int x,int y,int solmaze[n][m]){
21      if(x == n - 1 && y == m - 1 && maze[x][y] == 1){
22          solmaze[x][y] = 1;
23          return true;
24  }
25      if(safepath(maze, x, y)== true){
26          if (solmaze[x][y] == 1){
27              return false;}
28
29          solmaze[x][y] = 1;
30
31      if(mazecal(maze, x+1, y, solmaze)== true){
32          return true;
33      }
34      if(mazecal(maze, x, y+1, solmaze)== true){
35          return true;
36      }
37      solmaze[x][y] = 0;
38      return false;}
39  return false;
40  }
41  bool maze1(int maze[n][m]){
42      int solmaze[n][m] ={
43      { 0, 0, 0, 0},
44      { 0, 0, 0, 0},
45      { 0, 0, 0, 0},
46      { 0, 0, 0, 0}
47      };
48      if(mazecal(maze, 0, 0, solmaze)== false){
49          return false;
50      }
51      print(solmaze);
52      return true;
53  }
54
55
56  int main(){
57  int maze[n][m]={
58      { 1, 1, 0,1},
59      { 0, 1, 1, 1},
60      { 0, 1, 1, 0},
61      { 0, 0, 1, 1}
62      };
```

```
63      cout<<"Given Maze:\n"<<endl;
64      for(int i=0;i<n;i++){
65          for(int j=0;j<m;j++){
66              cout<<maze[i][j]<<" ";
67          }cout<<endl;
68      }
69      cout<<"\n----------------\n";
70      cout<<"\nSolved Maze:\n"<<endl;
71      maze1(maze);
72      return 0;
73  }
74
75
```

ces | Compile Log | Debug | Find Results

D:\Data Structures\lab 3\Task 5.exe

```
Given Maze:

1 1 0 1
0 1 1 1
0 1 1 0
0 0 1 1

----------------

Solved Maze:

1 1 0 0
0 1 0 0
0 1 1 0
0 0 1 1

--------------------------------
Process exited after 0.1014 seconds with return value 0
Press any key to continue . . .
```