Northern University Bangladesh (NUB)

LAB ASSIGNMENT-1

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DEP- CSE
SEC- B
4TH SEMESTER

SUBMITTED TO
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DATE OF SUBMISSION- 07/10/2023

Lab Work-1

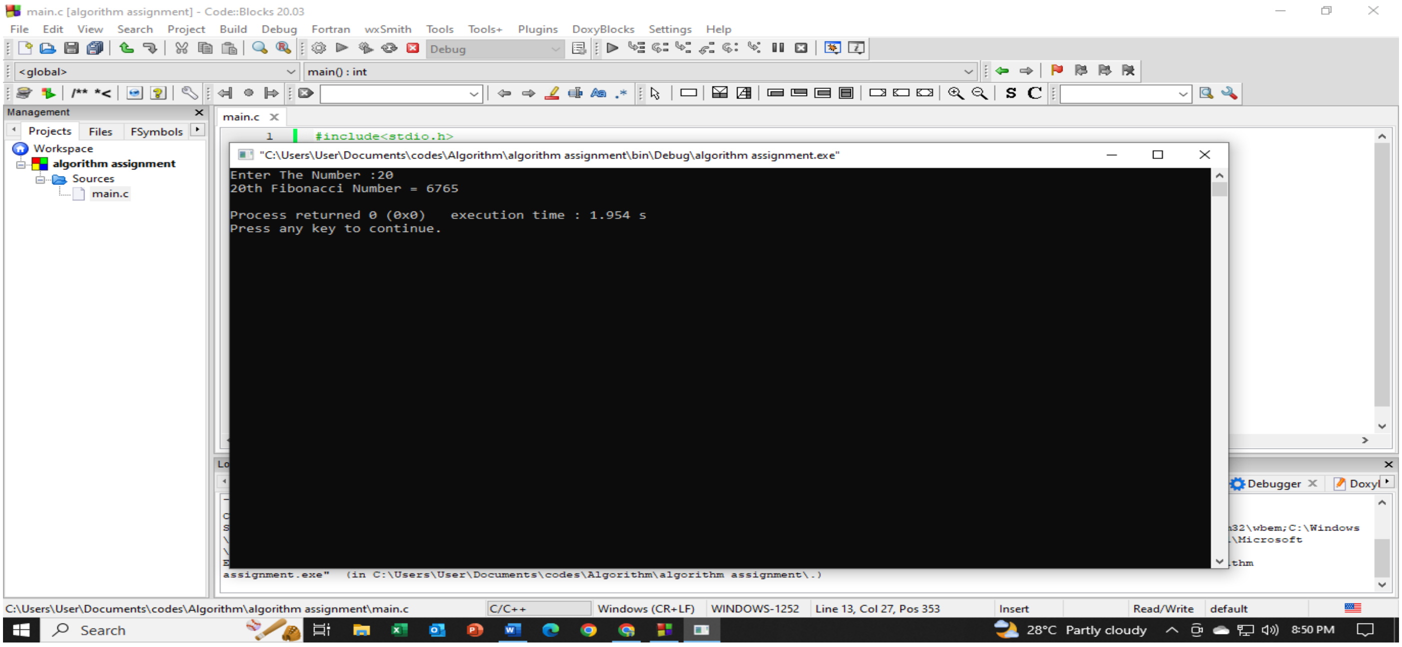
Sir, I tried but could not complete the problem.

Lab Assignment-2

1. For Loop And Find out the complexity of Method----Using C.

Code-

```
#include<stdio.h>
int main()
{
 int X=0, Y=1 ,Z, M;
 printf("Enter The Number :");
 scanf("%d",&M);
 if(M<=0)//----------------------------->Time complexity = O(1)
 printf("It is not Fibonacci Number");
else if(M==1)//---------------------->Time complexity = O(1)
printf("%dth Fibonacci Number = %d\n",M,X);
else
{
 for(int i=2; i<=M; i++)//-------->Time complexity = O(M)
 {
 Z = X+Y;
 X = Y;
 Y = Z;
 }
 printf("%dth Fibonacci Number = %d\n",M,Y);
}return 0;
}
```



main.c [algorithm assignment] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
<global>
main() : int
Management
Projects Files FSymbols
Workspace
algorithm assignment
Sources
main.c
Debugger
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"C:\Users\User\Documents\codes\Algorithm\algorithm assignment\bin\Debug\algorithm assignment.exe"

```
Enter The Number :20
20th Fibonacci Number = 6765

Process returned 0 (0x0)   execution time : 1.954 s
Press any key to continue.
```

```
assignment.exe"  (in C:\Users\User\Documents\codes\Algorithm\algorithm assignment\.)
```

C:\Users\User\Documents\codes\Algorithm\algorithm assignment\main.c | C/C++ | Windows (CR+LF) | WINDOWS-1252 | Line 13, Col 27, Pos 353 | Insert | Read/Write | default

Time complexity-O(M)

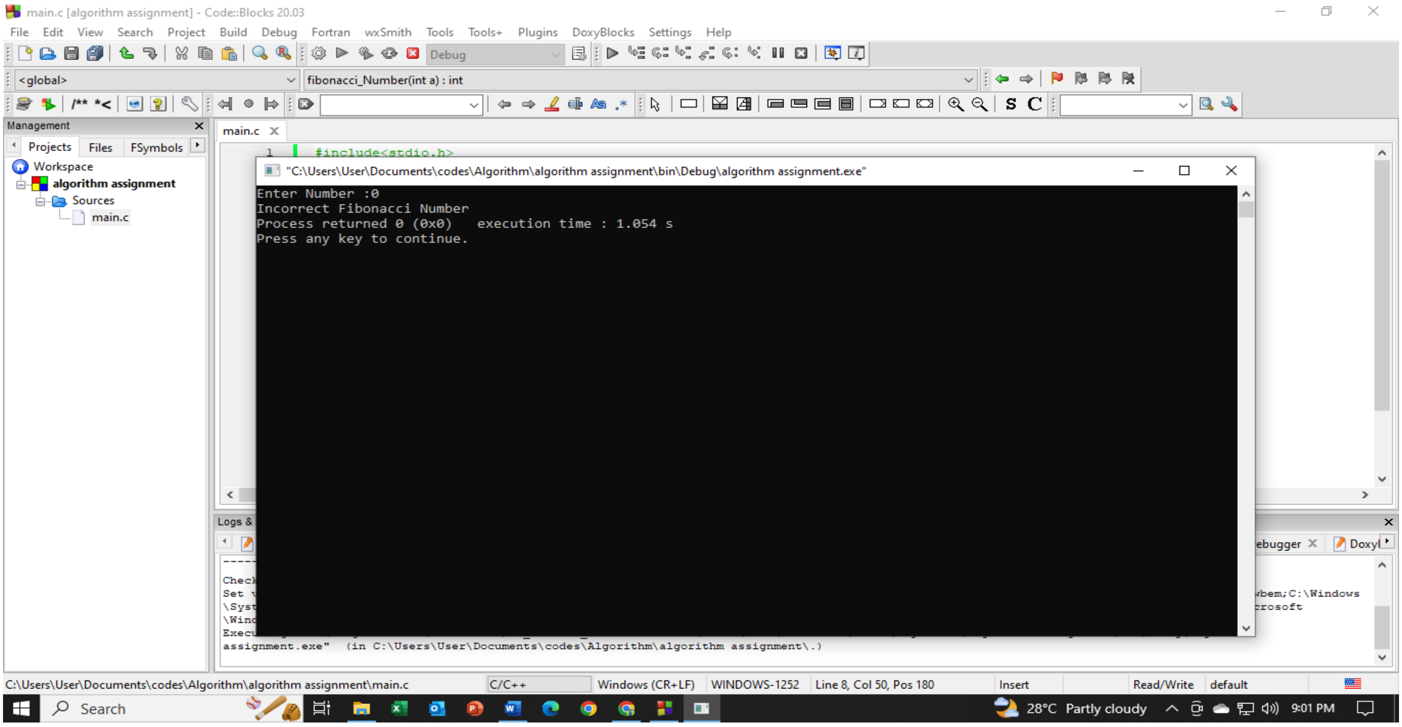
2. Recursion use And Find out the complexity of Method---- Using C.

Code-

```
#include<stdio.h>
int fibonacci_Number(int a)
 {
 if(a == 1)//------------------>Time complexity = O(1)
 return 1;
 else
 {
 return fibonacci_Number(a-1)+ fibonacci_Number(a);//---------------------------->Time complexity = O(a)

 }
 }
int main()
{

 int a,Number;
 printf("Enter Number :");
 scanf("%d",&a);
 if(a<=0)
 printf("Incorrect Fibonacci Number");
 else{
 Number = fibonacci_Number(a);
 printf("%dth Fibonacci Number = %d\n",a,Number);
 }
return 0;
}
```



"C:\Users\User\Documents\codes\Algorithm\algorithm assignment\bin\Debug\algorithm assignment.exe"

```
Enter Number :0
Incorrect Fibonacci Number
Process returned 0 (0x0)   execution time : 1.054 s
Press any key to continue.
```

Time Complexity- O(a).

Lab Assignment-3

1.Binary Search -----using in C.

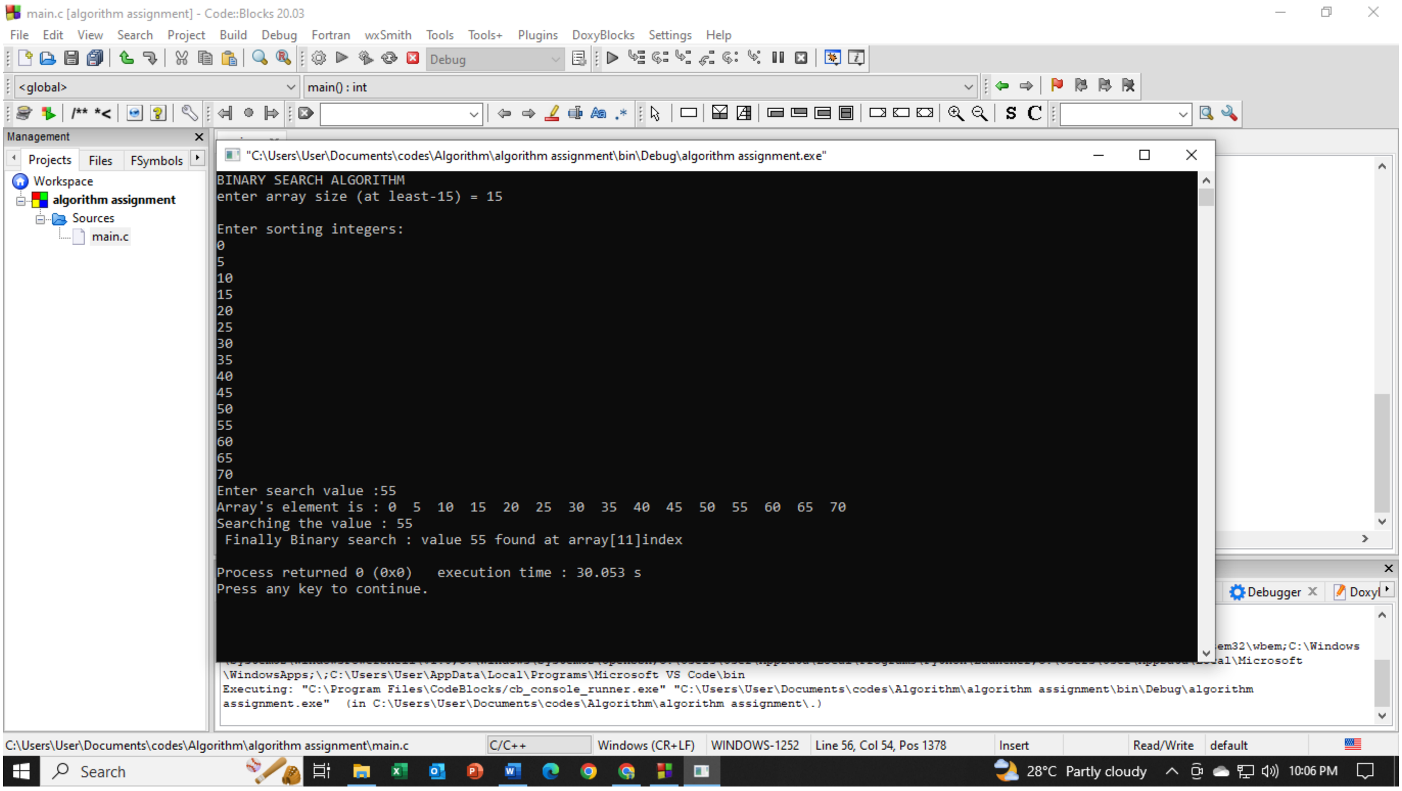
Code-

```
#include<stdio.h>
int Binary_Search(int array[],int array_size,int searching_value)
{
 int left_side = 0 , right_side = array_size-1,middle_side;
 while(left_side <= right_side)
 {
 middle_side = left_side + (right_side - left_side)/2;
 if(array[middle_side] == searching_value)
 {
 return middle_side;
 }else if(array[middle_side] < searching_value)
 {
 left_side = middle_side+1;
 }else
 right_side = middle_side-1;
 }
 return -1;


}
int main()
{

 printf("BINARY SEARCH ALGORITHM\n" );
 int array_size;
 printf("enter array size (at least-15) = ");
 scanf("%d",&array_size);
 if(array_size <15)
 {
 printf("Array Size must be at least 15.\n");
 return 1;
 }
 int array[array_size];
 printf("\nEnter sorting integers:\n",array_size);
 for(int i = 0; i < array_size; i++)
 {
 scanf("%d",&array[i]);
 }
 int searching_value;
 printf("Enter search value :");
 scanf("%d",&searching_value);
 printf("Array's element is :");
 for(int x = 0; x<array_size; x++)
 {
 printf(" %d",array[x]);
 if(x<array_size - 1)
 {
 printf(" ");
 }
 }printf("\n");
 printf("Searching the value : %d\n",searching_value);
 int rst = Binary_Search(array,array_size,searching_value);
 if(rst !=-1)
 printf(" Finally Binary search : value %d found at array[%d]index\n",searching_value,rst);
else
printf("Finally Binary Search : Value %d not found inarray\n",searching_value);
return 0;

}
```



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main() : int
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main.c
"C:\Users\User\Documents\codes\Algorithm\algorithm assignment\bin\Debug\algorithm assignment.exe"
Debugger
Doxyl
C:\Users\User\Documents\codes\Algorithm\algorithm assignment\main.c
C/C++
Windows (CR+LF)
WINDOWS-1252
Line 56, Col 54, Pos 1378
Insert
Read/Write
default
Search
28°C Partly cloudy
10:06 PM

```
BINARY SEARCH ALGORITHM
enter array size (at least-15) = 15

Enter sorting integers:
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Enter search value :55
Array's element is : 0  5  10  15  20  25  30  35  40  45  50  55  60  65  70
Searching the value : 55
 Finally Binary search : value 55 found at array[11]index

Process returned 0 (0x0)   execution time : 30.053 s
Press any key to continue.
```

```
em32\wbem;C:\Windows
al\Microsoft
\WindowsApps;\;C:\Users\User\AppData\Local\Programs\Microsoft VS Code\bin
Executing: "C:\Program Files\CodeBlocks/cb_console_runner.exe" "C:\Users\User\Documents\codes\Algorithm\algorithm assignment\bin\Debug\algorithm
assignment.exe"  (in C:\Users\User\Documents\codes\Algorithm\algorithm assignment\.)
```