CSS-114- FUNDAMENTALS OF PROGRAMMING

ASSIGNMENT 2

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TASK 1: WRITE A PROGRAM TO PRINT A CIRCLE.

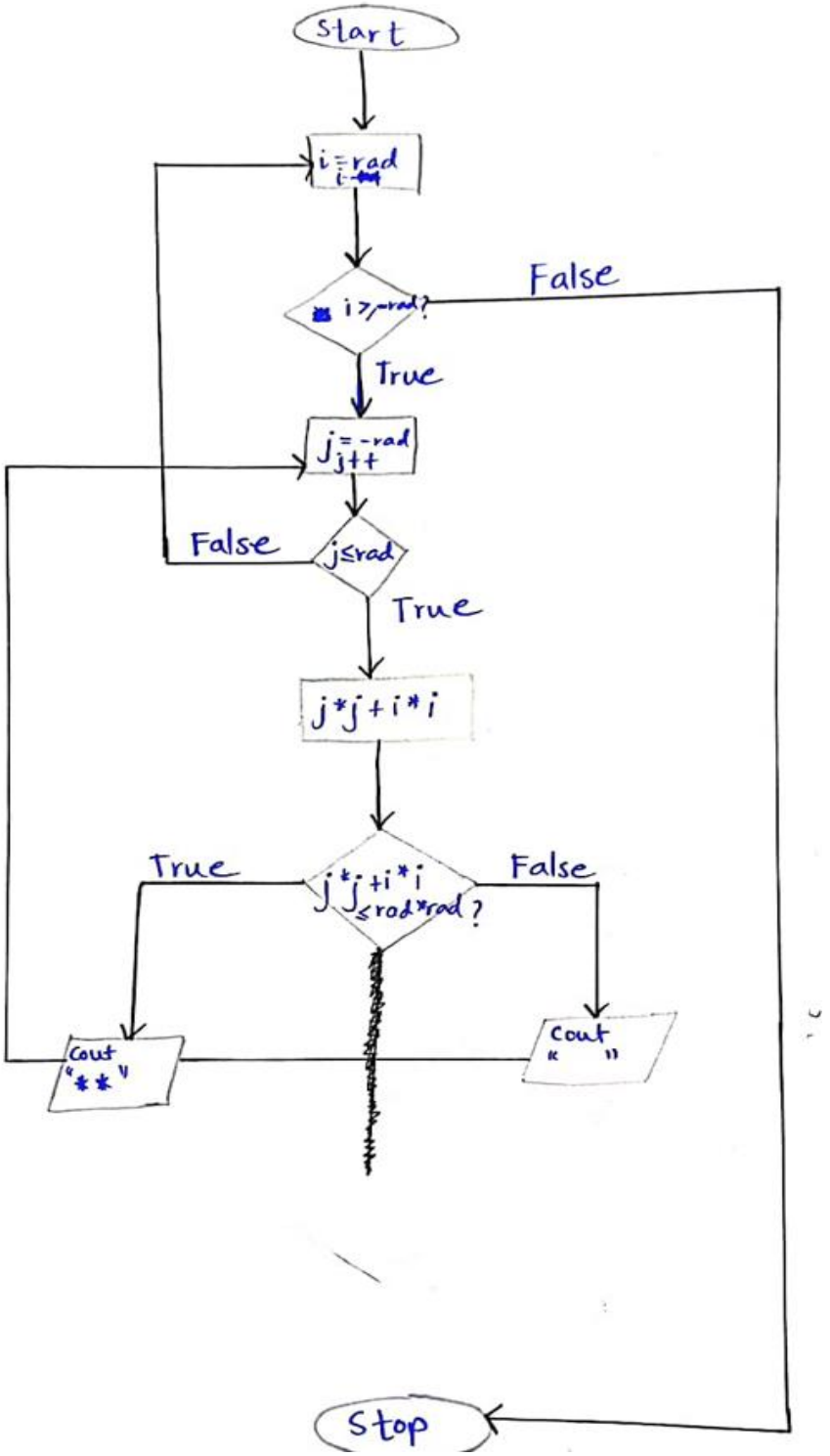
CODE:

```
#include<iostream>

using namespace std;

int main (){

	cout<<"ASSIGNMENT 2, TASK 1."<<endl; //to print a circle

	int rad;

	cout<<"Enter the radius of the circle:"<<endl; //input radius of the circle from the user

	cin>>rad;

	for(int i=rad;i>=-rad;i--){

		for(int j=-rad;j<=rad;j++){  //using nested loops, we create a system using the equation where the sum square of the variables i and j

			if(j*j + i*i <= rad*rad){ //must be less or equal to the square of the radius

			cout<<"**"; } //if the stars are to be printed

			else{

				cout<<"  ";

			}

	} cout<<endl;   //since this program essentially prints 1/4  parts of the circle side by side, we add and end line statement

} return 0; }
```

OUTPUT:


C:\Users\HP\Desktop\Cpp Projects\FoP Assignment 2 Task 1.exe
ASSIGNMENT 2, TASK 1.
Enter the radius of the circle:
15
Process exited after 14.39 seconds with return value 0
Press any key to continue . . .

FLOW DIAGRAM:

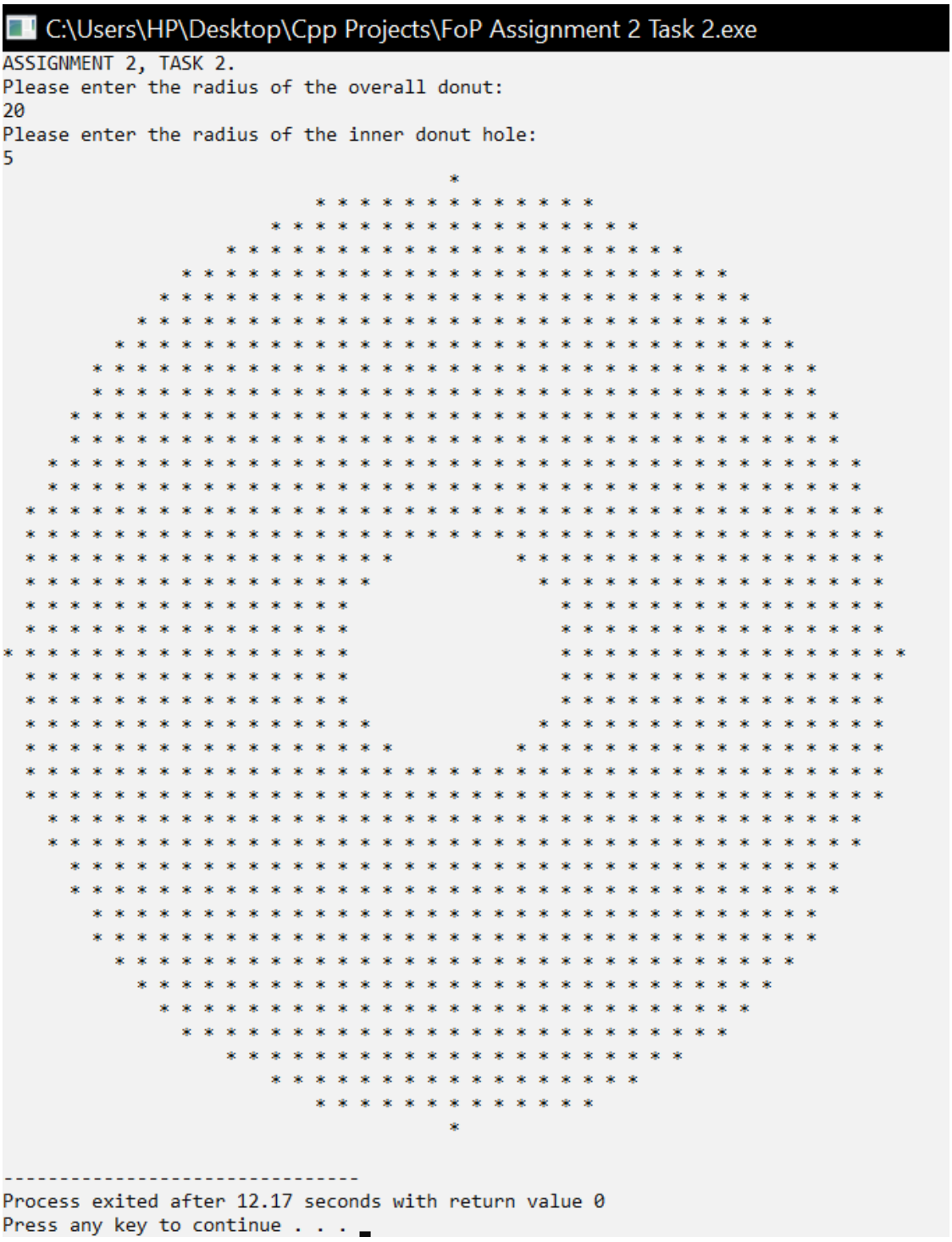


TASK 2: WRITE A PROGRAM TO PRINT A DONUT.

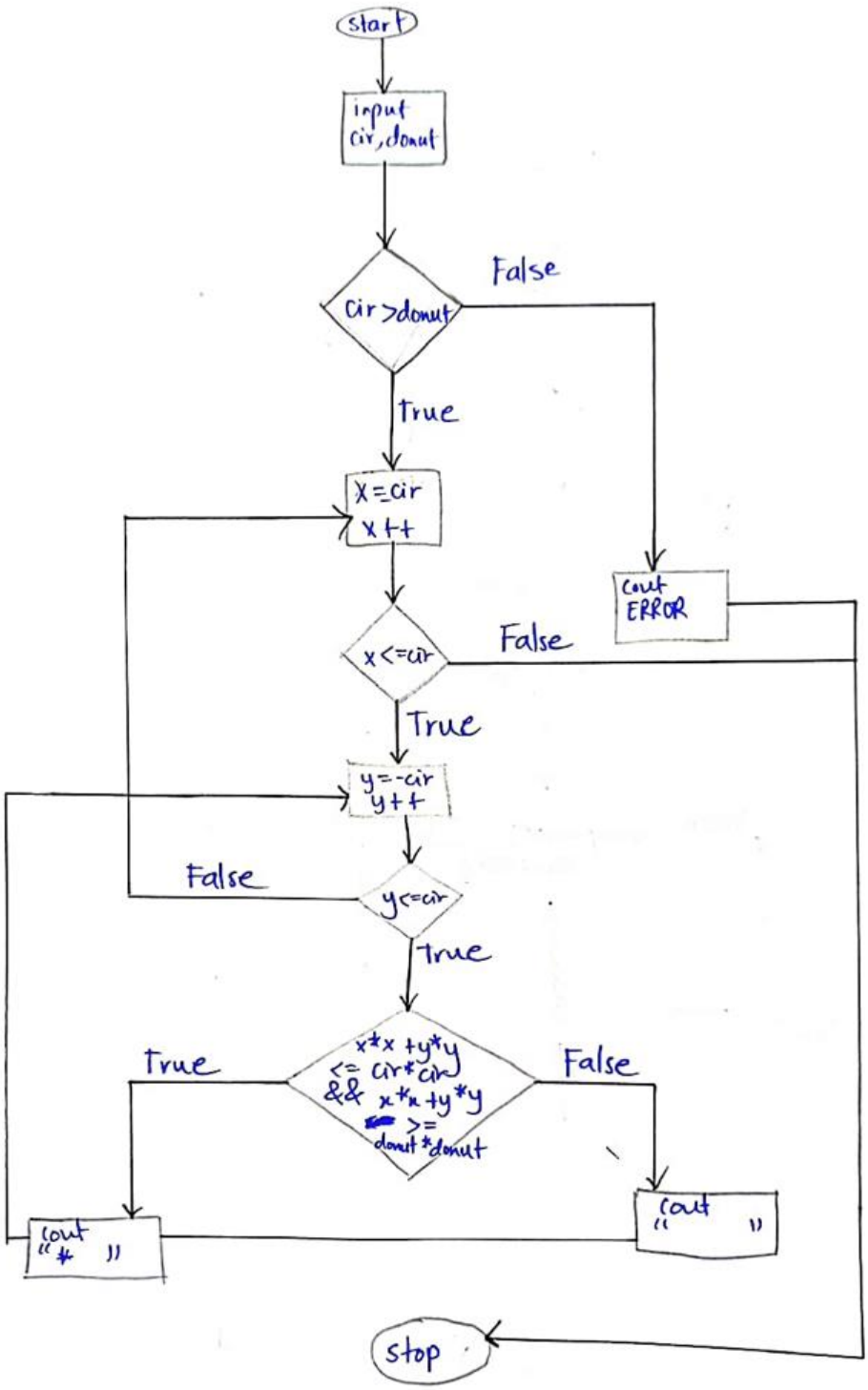
CODE:

```
#include<iostream>

using namespace std;

int main (){

        cout<<"ASSIGNMENT 2, TASK 2."<<endl; //to print a donut

        int cir,donut;

        cout<<"Please enter the radius of the overall donut:"<<endl;  //input the outer radius from the
user

        cin>>cir;

        cout<<"Please enter the radius of the inner donut hole:"<<endl;   //input the inner radius from
the user

        cin>>donut;


        if(cir>donut){   //the outer radius cannot be smaller than the inner radius, so we set a condition

                for(int x=-cir;x<=cir;x++){

                for(int y=-cir;y<=cir;y++)

if( (x*x + y*y) <= (cir*cir) && (x*x + y*y) >= (donut*donut) ) //we utilise a similar method we used for
printing a circle, but altering it for the hole

   { cout<<"* ";   }

else{ cout<<"  ";}

     cout<<endl;   //since this program essentially prints 1/4 parts of the donut side by side, we add and
end line statement

                    }

                }


else{ cout<<"The Dimensions entered were invalid, please run the program and try again."<<endl;
        }

 return 0; }
```

OUTPUT:


C:\Users\HP\Desktop\Cpp Projects\FoP Assignment 2 Task 2.exe
ASSIGNMENT 2, TASK 2.
Please enter the radius of the overall donut:
20
Please enter the radius of the inner donut hole:
5
Process exited after 12.17 seconds with return value 0
Press any key to continue . . .

FLOW DIAGRAM:



TASK 3: WRITE A PROGRAM TO TAKE INPUTS OF SEVERAL STUDENTS' MARKS AND ASSIGN GRADES.

CODE:

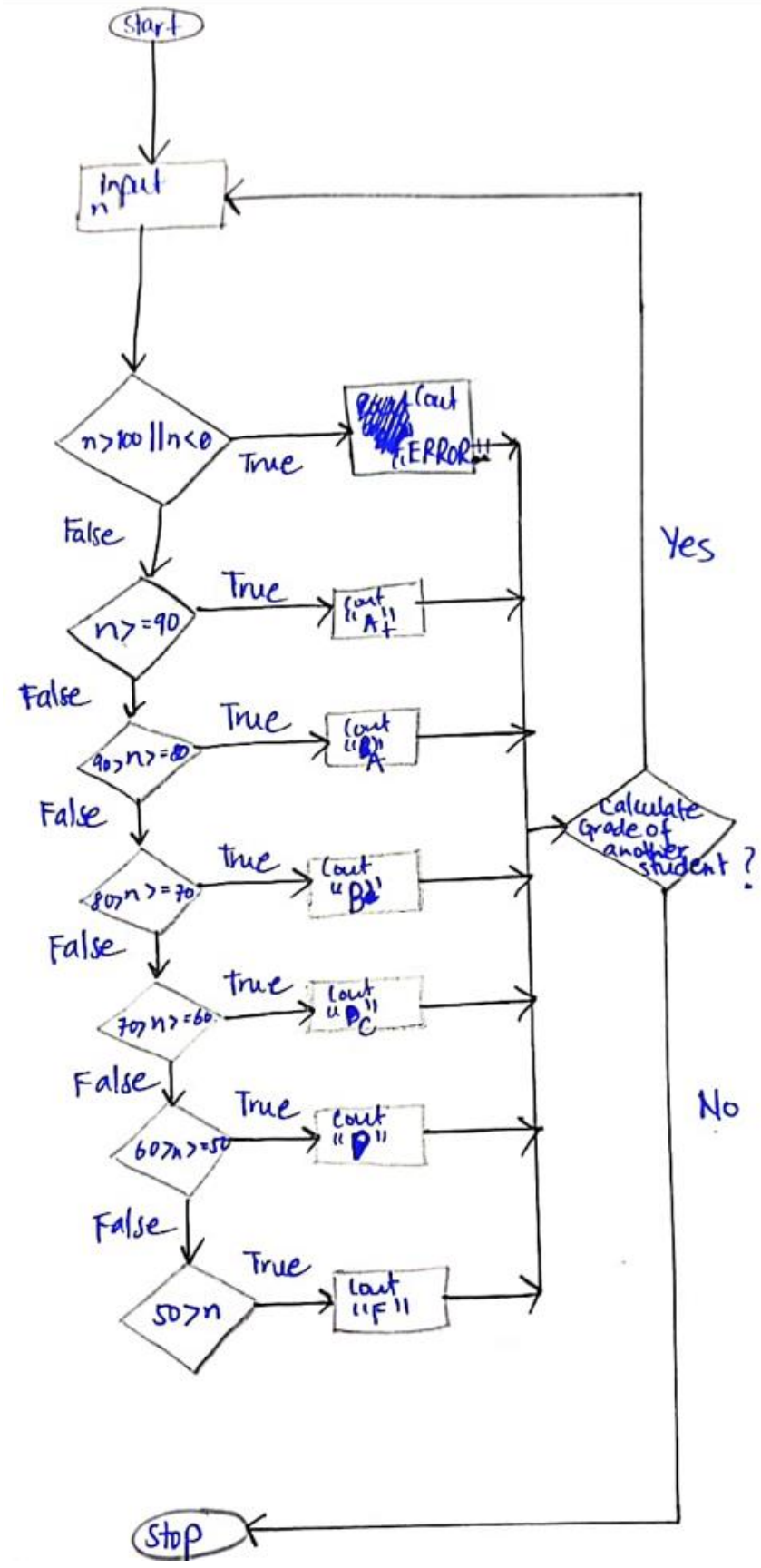
```
#include<iostream>

using namespace std;

int main (){

        cout<<"ASSIGNMENT 2, TASK 3."<<endl; //program to calculate grade of a number of students using input from the user

        int n;

        char ans;

   do{   //start a do-while loop

        cout<<"Please enter the marks scored by the student:"<<endl; //input a score from the user

        cin>>n;

        if(n>100 || n<0){  //if marks are above 100 or below 0, program will deny the input

        cout<<"The Marks entered are invalid."<<endl;   }

        else{

        if(n>=90)       { cout<<"The Student has achieved an A+ Grade."<<endl; } //using if statements, grades are assigned to each range value of marks

        if(n>=80 and n<90){       cout<<"The Student has achieved an A Grade."<<endl; }

        if(n>=70 and n<80){       cout<<"The Student has achieved a B Grade."<<endl; }

        if(n>=60 and n<70){       cout<<"The Student has achieved a C  Grade."<<endl; }

   if(n>=50 and n<60){    cout<<"The Student has achieved a D Grade."<<endl; }

   if(n<50)        { cout<<"The Student has achieved an F Grade."<<endl; }

    }


  cout<<"Would you like to calculate the grade of another student?(Y/N)"<<endl; //ask to input the marks of another student, and run the loop again

   cin>>ans;

                                        //if answer is yes
```

```
}while(ans=='Y');

return 0;  }
```

OUTPUT:

```
ASSIGNMENT 2, TASK 3.
Please enter the marks scored by the student:
91
The Student has achieved an A+ Grade.
Would you like to calculate the grade of another student?(Y/N)
Y
Please enter the marks scored by the student:
56
The Student has achieved a D Grade.
Would you like to calculate the grade of another student?(Y/N)
Y
Please enter the marks scored by the student:
78
The Student has achieved a B Grade.
Would you like to calculate the grade of another student?(Y/N)
Y
Please enter the marks scored by the student:
101
The Marks entered are invalid.
Would you like to calculate the grade of another student?(Y/N)
N

--------------------------------
Process exited after 20.09 seconds with return value 0
Press any key to continue . . .
```

FLOW DIAGRAM:


Start
Input n
n>100 || n<0
True
Cout "ERROR!!!"
False
n>=90
True
Cout "A+"
False
90>n>=80
True
Cout "A"
False
80>n>=70
True
Cout "B"
False
70>n>=60
True
Cout "C"
False
60>n>=50
True
Cout "D"
False
50>n
True
Cout "F"
Calculate Grade of another student ?
Yes
No
Stop