Assignment-4

Q1 - write a c program to generate Fibonacci number till 20 and apply cyclomatic complexity of measurement.

Ans.

```c
#include <stdio.h>
int main() {
    int n = 20;
    int first = 0, second = 1, next;
    printf("Fibonacci Series: \n");
    for (int i = 0; i < n; i++) {
        if (i <= 1)
            next = i;
        else {
            next = first + second;
            first = second;
            second = next;
        }
        printf("%d\n", next);
    }
    return 0;
}
```

```
Output

/tmp/VhrTfoqsFm.o
Fibonacci Series:
0
1
1
2
3
5
8
13
21
34
55
89
144
233
377
610
987
1597
2584
4181
```

Now, to measure the cyclomatic complexity of this program, we need to count the number of decision points in the code, which includes loops, conditional statements, and other control structures.

The formula to calculate cyclomatic complexity is:

$$V(G) = E - N + 2P$$

Where:

$V(G)$ = Cyclomatic Complexity

E = Number of edges in the flow graph

N = Number of nodes in the flow graph

P = Number of connected components (P = 1 for a single program)

Let's calculate the cyclomatic complexity of the given program.

The flow graph for the program is as follows:

Nodes: 10 (each line of code is a node)

Edges: 11 (connections between nodes)

Using the formula: $V(G) = E - N + 2P$ $V(G) = 11 - 10 + 2(1)$ $V(G) = 3$

So, the cyclomatic complexity of the given program is 3.