Indian Institute of Information Technology, Allahabad
Software Engineering (SE)
Lab task 1 2019
(B-Tech 5th semester sec. A and sec. B)

Q.1: Write a Java code which takes "input.c" as the input file and returns following thing as output:-

1. Total Number of functions in the C program along with their function Signature.
2. Tell the total number of function calls being made in the program (excluding main()).
3. Tell all the header files included in the c file.
4. Tell the total number of nested loops (while ,for ,do-while) in the c file along with their names and line number.
5. Tell the total number of cases of switch (if present in code) .
6. Tell all the nested conditional statements (i.e name and their line numbers).

Hint :- Don't try to use brute force method to find. Study "regex" use in Java.

Note 1**:-** Rest of the assignments would be based on the extensive use of "regex". Assume line number indexing starts from zero (from header files).

Note2 :- Write all the output in a file "enrollnumber.txt".

Note3 :- Make sure that your code reads a c file "input.c" and the output file name is "enrollnumber.txt" (ex:- "iit2014001.txt").

Q.2: Cyclomatic complexity of each function can be calculated as -

$$\mathbf{C = D + 1}$$

Where **D** represents decison points
Total Complexity **(TC)** of the code -

$$\mathbf{TC = C_1 + C_2 + C_3 + ... + C_n}$$

where $\mathbf{C}_i$ represents the cyclomatic complexity of the i^{th} function.

Example:

Input Fomat:- example.c

```
# include <stdio.h>
void triangle(int, int, int);
void maxi(int, int, int);
int main()
{
        int a= 10, b= 20, c= 30 ;
        triangle(a, b, c);
        maxi(a, b, c);
        return 0;
}
void triangle(int a, int b, int c)
{
        if(a*a == b*b + c*c )
        {
                printf("Pythagorean triplet");
        }
        else
        {
```

```
                if( b + c > a )
                {
                        printf("triangle");
                }
                else
                {
                        printf("Not triangle");
                }
        }
}
void maxi(int a, int b, int c)
{
        if(a > b)
        {
                if(a > c)
                {
                        printf("%d", a);
                }
                else
                {
                        printf("%d", c);
                }
        }
        else
        {
                if(b > c)
                {
                        printf("%d", b);
                }
                else
                {
                        printf("%d", c);
                }
        }
}
```

Output Format:
Function main **(C_1):** 0 + 1 = 1
Function triangle**(C_2):** 2 + 1 = 3
Function maxi(**C_2):** 3 + 1 = 4
TC = 1 + 4 +3 = 8

Q. 3: Write a code which takes a c code snippet as input. The code should calculate cyclomatic complexity for each function and total complexity of the given input.