**SOE Makeup Lab Exam 2018**

**Date: 17/12/2018 Maximum Marks: 20 Time: 2 Hrs.**

**Instruction:**

1. **Operating System: Linux.**
2. **IDE: Netbeans**
3. **Database: MySQL**

**Use of other operating system or IDE or database will not be entertained. So please prepare your system accordingly.**

**Students will be expected to complete and show during lab hours one assignment per week. The first lab test will be based on these assignments.**

**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 -

**C = D + 1**

Where **D** represents decison points

Total Complexity **(TC)** of the code -

**TC = C1 + C2 + C3 + ...... + Cn**

where **C**i represents the cyclomatic complexity of the ith 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 **(C1):** 0 + 1 = 1

Function triangle**(C2):** 2 + 1 = 3

Function maxi(**C2):**  3 + 1 = 4

**TC** = 1 + 4 +3 = 8

**Question:**

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.