SYMBIOSIS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Software Testing and Quality Assurance

Lab Assignment – 8

PRN: 15070121170

NAME: Yash Saboo

BRANCH: CS (C4)

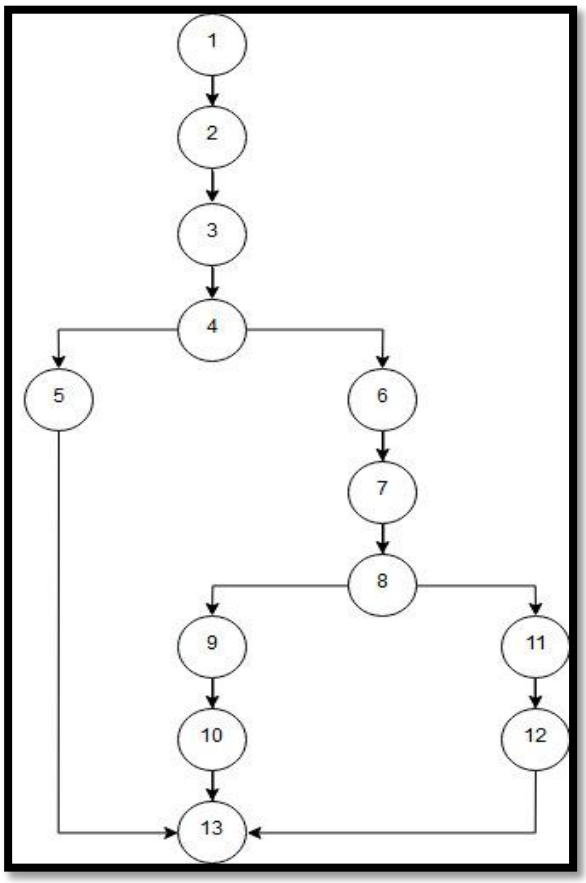
Question: Write a program in C for the determination of the nature roots of a quadratic equation; its input is a triple of positive integers say a, b, and c and value from the interval 0 to 100. Also, the output may have one of the following word: not a quadratic equation, real roots, imaginary roots, equal roots. Do the following:

- Draw the flow graph and DD graph.
- Find independent paths from DD graph.
- Calculate cyclomatic complexity.

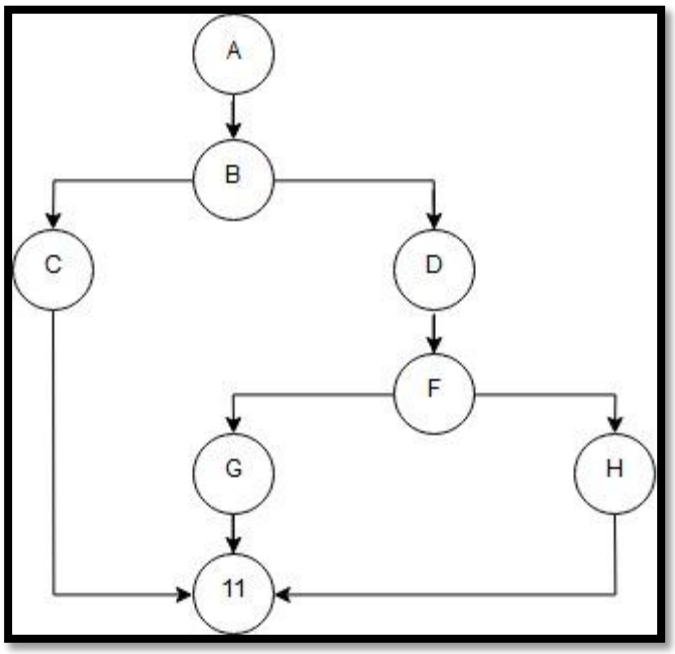
Code (written in Python using Jupyter Notebook):

```
a = 1
b = 2
c = 1
print("Nature of Quadratic Equation for ax^2 + bx + c\n");
if(a == 0):
        print("Not a quadratic equation.\n");
elif((b*b-4*a*c) > 0):
        print("The equation has real and distinct roots.\n");
elif((b*b-4*a*c) == 0):
        print("The equation has real and equal roots.\n");
else:
        print("The equation has imaginary roots.\n");
```

Flow Graph:



DD Graph:



Connection Matrix:

	A	B	C	D	F	G	H	I
A		1						
B			1	1				
C								1
D					1			
F						1	1	
G								1
H								1
I								

Cyclomatic Complexity:

The complexity is Number of Simple decisions + 1 = 3+1 = 4

CC = Edges – Nodes + 2
= 9 - 8 + 2
= 3

Independent Paths:

a. A-B-C-I
b. A-B-D-F-G-I
c. A-B-D-F-H-I

Test Cases:

Test Id	Test Description	Path	Input			Expected Output	Actual Output	Status
			a	b	c			
1	Display the nature of roots of quadratic equation	A-B-C-I	0	50	50	Invalid	Invalid	Pass
		A-B-D-F-G-I	1	50	50	Real and different roots	Real and different roots	Pass
		A-B-D-F-H-I	50	50	50	Complex roots	Complex roots	Pass