

## STQA Assignment-2

DATE:

Q1) A program reads three numbers A, B, C within the range  $[1, 50]$  and prints the largest number. Design test cases for this using BVC, robust testing and worst case testing methods.

Ans - BVC -

$$\text{Total number of test cases} = 4n + 1 = 4(3) + 1 = 13$$

Min value = 1

Min+ value = 2

Nominal value = 25

Max - value = 49

max value = 50

Test case Id	A	B	C	Expected Output
1	1	25	27	C
2	2	25	26	C
3	49	25	28	A
4	50	25	29	A
5	25	1	30	C
6	25	2	26	C
7	25	49	27	B
8	25	50	28	B
9	25	27	1	B
10	25	28	2	B
11	25	26	49	C
12	25	26	50	C
13	25	25	25	Equal

## b) Robust testing -

$$\text{total test cases} = n+1 = 6(3)+1 = \underline{\underline{19}}$$

$$\text{min-value} = 0$$

$$\text{min value} = 1$$

$$\text{min+ value} = 2$$

$$\text{Nominal value} = 25$$

$$\text{max-value} = 49$$

$$\text{max value} = 50$$

$$\text{max+ value} = 51$$

Test case Id	A	B	C	Expected outcome
1	0	25	27	Invalid
2	1	25	27	C
3	2	25	28	C
4	49	25	25	A
5	50	25	29	A
6	51	27	25	Invalid
7	25	0	26	Invalid
8	25	1	30	C
9	25	2	26	C
10	25	49	27	B
11	25	50	28	B
12	26	51	25	Invalid
13	25	26	0	Invalid
14	25	28	1	B
15	25	29	2	B
16	25	10	49	C
17	25	17	50	C
18	25	19	51	Invalid
19	25	25	25	Equal

c) Worst case testing-

$$\text{total test cases} = 5^n = 5^{93} = \underline{\underline{125}}$$

min value = 1

Min + value = 2

Nominal value = 25

Max - value = 49

max value = 50

Test case Id	A	B	C	Expected outcome.
1	1	25	1	B
2	1	25	2	B
3	1	25	25	B, C
4	1	25	49	C
5	1	25	50	C
6	2	25	51	A, B
7	2	2	72	A, B, C
8				
9				
10				
11				
12				
13				
14				
15				
124	25	250	50	B, C
125	25	250	50	B, C



Q2) A program reads three numbers A, B, and C with a range  $[1, 50]$  and prints the largest number. Design test cases for this program using equivalence class testing technique.

Ans -

$$I_1 = \{ \langle A, B, C \rangle : 1 \leq A \leq 50 \}$$

$$I_2 = \{ \langle A, B, C \rangle : 1 \leq B \leq 50 \}$$

$$I_3 = \{ \langle A, B, C \rangle : 1 \leq C \leq 50 \}$$

$$I_4 = \{ \langle A, B, C \rangle : A < 1 \}$$

$$I_5 = \{ \langle A, B, C \rangle : A > 50 \}$$

$$I_6 = \{ \langle A, B, C \rangle : B < 1 \}$$

$$I_7 = \{ \langle A, B, C \rangle : B > 50 \}$$

$$I_8 = \{ \langle A, B, C \rangle : C < 1 \}$$

$$I_9 = \{ \langle A, B, C \rangle : C > 50 \}$$

Test cases -

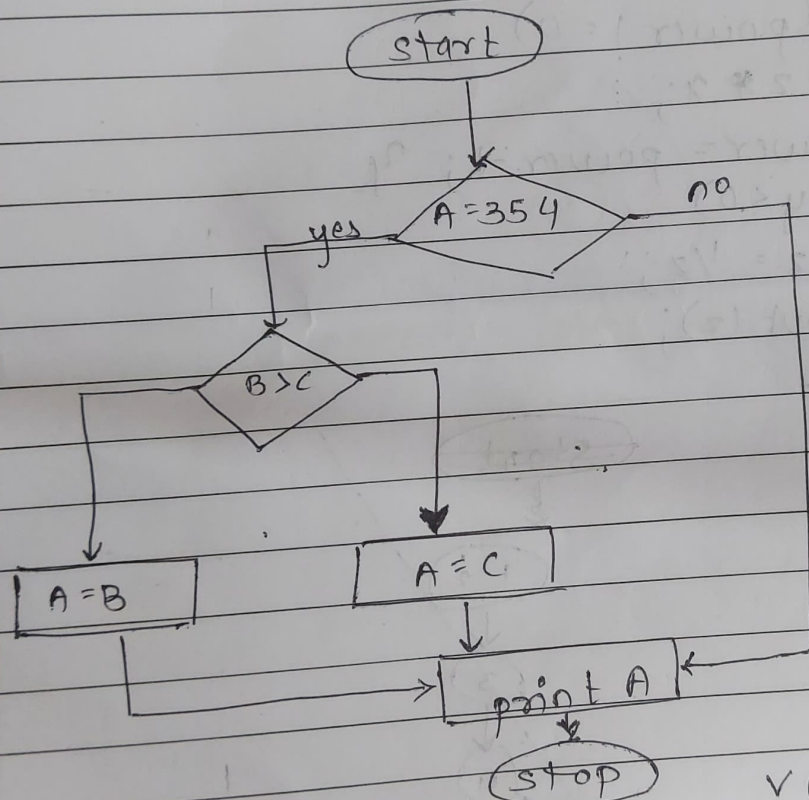
Test case ID	A	B	C	Expected results	Test class
1	13	25	36	C	$I_1, I_2, I_3$
2	0	13	45	Invalid	$I_4$
3	51	34	14	Invalid	$I_5$
4	29	0	18	Invalid	$I_6$
5	36	53	32	Invalid	$I_7$
6	24	42	0	Invalid	$I_8$
7	33	21	51	Invalid	$I_9$

q3) calculate cyclomatic complexity for the given code.

```

if A=354
then if B>C
then A=B
else A=C
end if
end if
print A.

```



$$\begin{aligned}
 V(G) &= e - n + 2p \\
 &= 8 - 7 + 2(1) \\
 &= \underline{\underline{3}}
 \end{aligned}$$

$$\begin{aligned}
 V(G) &= \text{number of regions} \\
 &\quad \text{in graph} \\
 &= 3
 \end{aligned}$$

$$\begin{aligned}
 V(G) &= d + p \\
 &= 2 + 1 \\
 &= \underline{\underline{3}}
 \end{aligned}$$

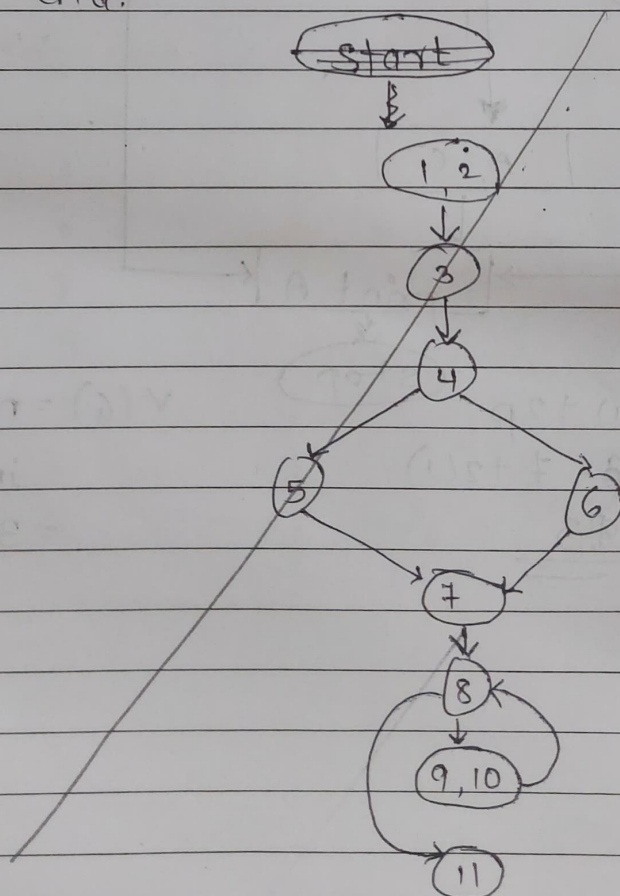


Q4) Calculate cyclomatic complexity for the given code

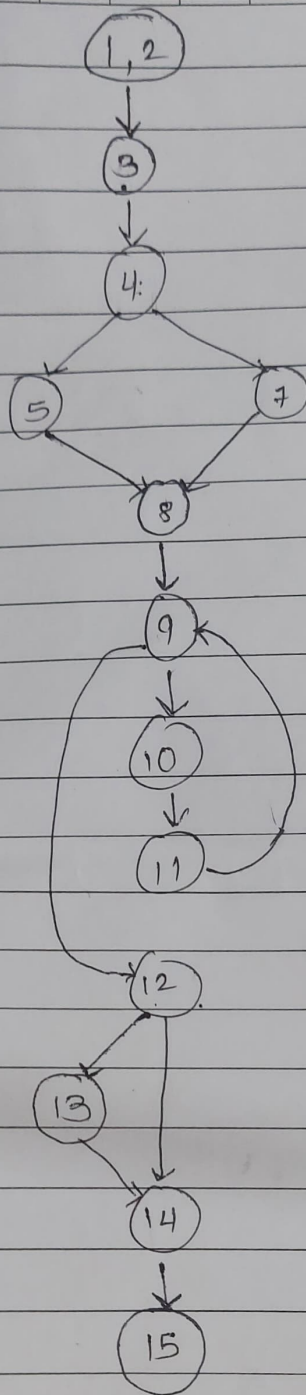
```

1  int x, y, power;
2  float z;
3  input(x, y);
4  if (y < 0);
5      power = -y;
6  else
7      power = y;
8  z = 1
9  while (power != 0)
10     z = z * x;
11     power = power - 1;
12     if (y < 0)
13         z = 1/z;
14     output(z);
15 end.

```



DATE:



$$\begin{aligned}
 V(G) &= e - n + 2p \\
 &= 15 - \overset{13}{\cancel{15}} + 2(1) \\
 &= 4
 \end{aligned}$$

$$\begin{aligned}
 V(G) &= d + p \\
 &= 3 + 1 \\
 &= 4
 \end{aligned}$$

$$\begin{aligned}
 V(G) &= \text{number of regions} \\
 &= 4
 \end{aligned}$$