Fall 2019

CSE-5321-002 - Software Testing

Homework Assignment 3

Name	UTA ID
Goutami Padmanabhan	1001669338

Please find the worksheet I used for calculations (HW_3_answers.xlsx), attached to the zip file I submitted.

Question 1

Decision table:

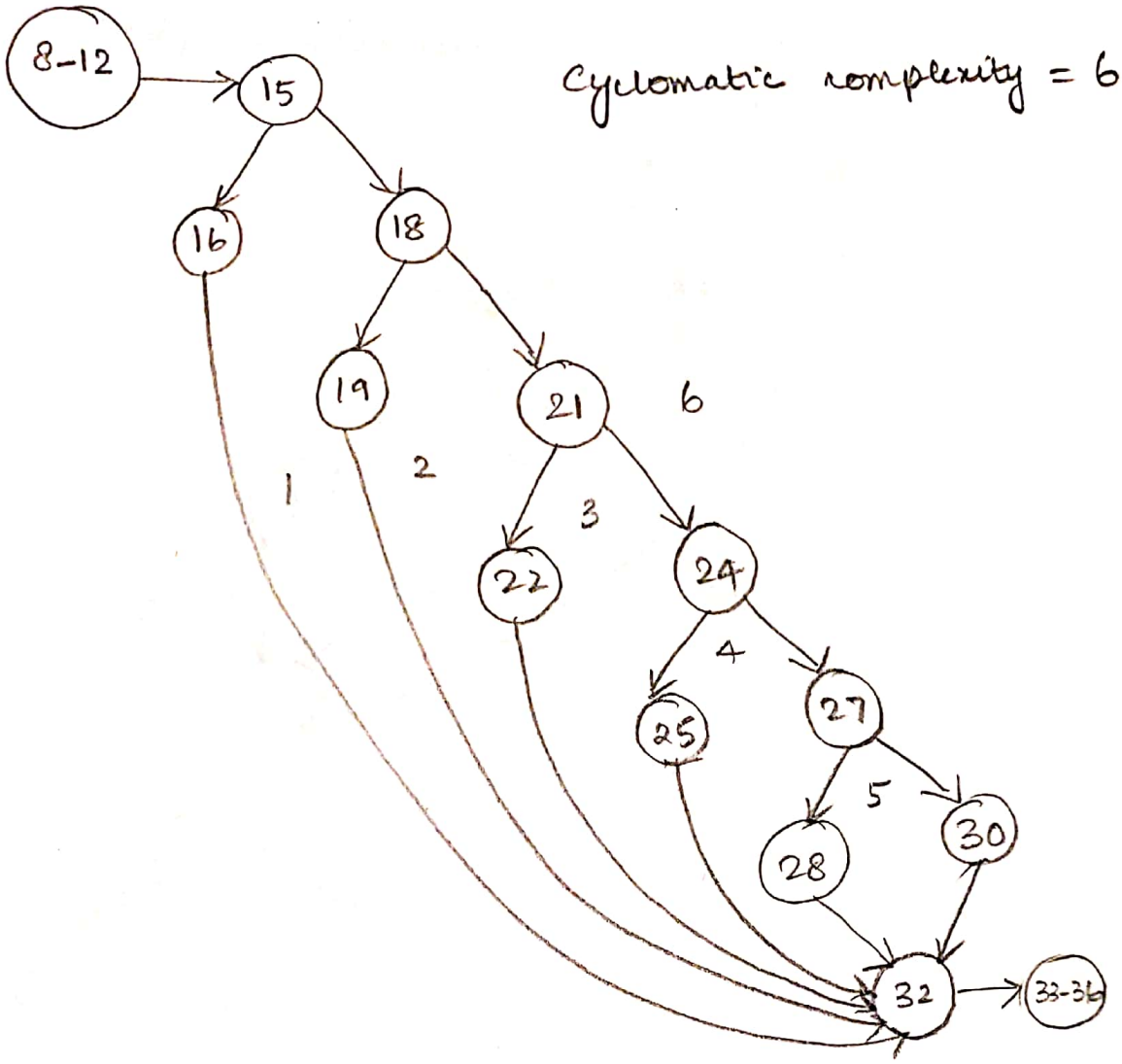
	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5	Rule 6
Conditions						
250.1 <= batteryPower (watts) <= 1,000.0	Y					
125.0 <= batteryPower (watts) <= 250.0		Y				
75.1 <= batteryPower (watts) <= 124.9		Y	Y			
50.0 <= batteryPower (watts) <= 75.0			Y	Y		
0.1 <= batteryPower (watts) <= 49.9					Y	
batteryPower (watts) == 0.0						Y
Actions						
green	ON	OFF	OFF	OFF	OFF	OFF
yellow	OFF	ON	ON	OFF	OFF	OFF
red	OFF	OFF	ON	ON	OFF	OFF
bell	OFF	OFF	OFF	OFF	ON	OFF
siren	OFF	OFF	OFF	OFF	OFF	ON
Table implements "first-of" rule						

Test case table:

Test Case Number	Inputs	Expected Outputs					Basis Path	Comments
	batteryPower(watts)	red	yellow	green	bell	siren		
1	0.0	FALSE	FALSE	FALSE	FALSE	TRUE	15-16-32	
2	49.9	FALSE	FALSE	FALSE	TRUE	FALSE	15-18-19-32	
3	75.0	TRUE	FALSE	FALSE	FALSE	FALSE	15-18-21-22-32	
4	124.9	TRUE	TRUE	FALSE	FALSE	FALSE	15-18-21-24-25-32	
5	250.0	FALSE	TRUE	FALSE	FALSE	FALSE	15-18-21-24-27-28-32	
6	250.1	FALSE	FALSE	TRUE	FALSE	FALSE	15-18-21-24-27-30-32	
7	0.1	FALSE	FALSE	FALSE	TRUE	FALSE	-	
8	50.0	TRUE	FALSE	FALSE	FALSE	FALSE	-	
9	75.1	TRUE	TRUE	FALSE	FALSE	FALSE	-	
10	125.0	FALSE	TRUE	FALSE	FALSE	FALSE	-	
11	1000.0	FALSE	FALSE	TRUE	FALSE	FALSE	-	Extreme range test

Code coverage achieved is: full boundary coverage, full statement coverage, full decision coverage and extreme range coverage.

The test cases support the description (logical expression).



Cyclomatic complexity = 6

Question 2

Decision table:

	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5
Conditions					
$5,000.01 <= premium (dollars) <= $10,000.00	Y				
$2,000.00 <= premium (dollars) <= $5,000.00		Y			
$1,250.01 <= premium (dollars) <= $1,999.99			Y		
$350.00 <= premium (dollars) <= $1,250.00				Y	
$0.00 <= premium (dollars) <= $349.99					Y
Actions					
discount	0.2	0.15	0.10	0.05	0.00
Table implements "first-of" rule					

Test case table:

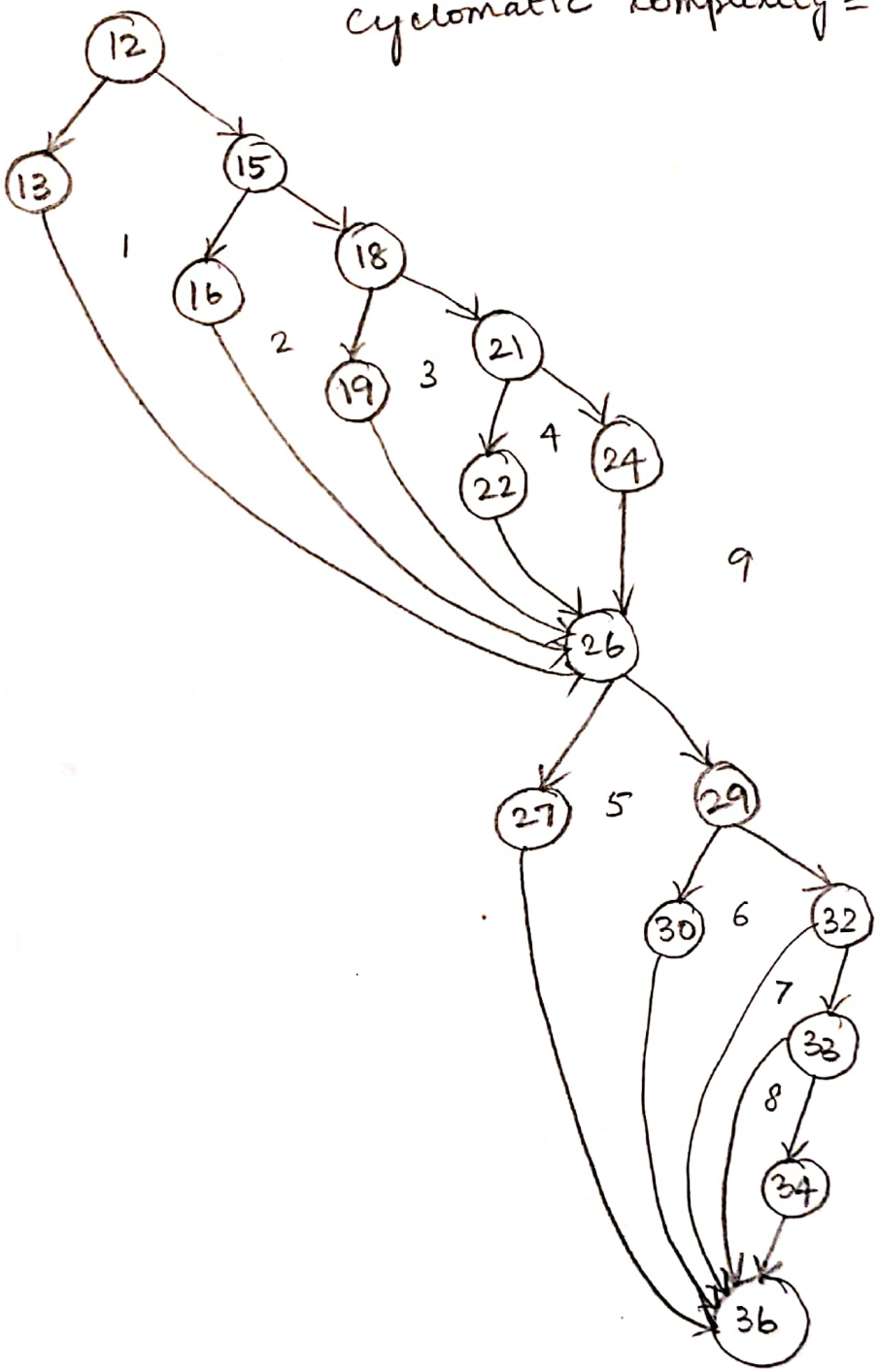
TestCaseNumber	Inputs						Expected outputs		Basis Path	MCDC stmt 26-34
	premium	policyHolder	yearsMember	multiPolicies	safetyRating	taxRate	primeStatus	totalPremium		
1	$5,000.01	TRUE	5	TRUE	500	0.0825	TRUE	$4,330.01	12-13-26-27-36	
2	$2,000.00	TRUE	5	TRUE	500	0.0825	TRUE	$1,840.25	12-15-16-26-27-36	
3	$1,250.01	TRUE	5	TRUE	500	0.0825	TRUE	$1,217.82	12-15-18-19-26-27-36	
4	$350.00	TRUE	5	TRUE	500	0.0825	TRUE	$359.93	12-15-18-21-22-26-27-36	
5	$349.99	TRUE	5	TRUE	500	0.0825	TRUE	$378.86	12-15-18-21-24-26-27-36	

6	$349.99	FALSE	6	TRUE	500	0.0825	TRUE	$378.86	12-15-18-21-24-26-29-30-36	
7	$349.99	FALSE	5	FALSE	500	0.0825	FALSE	$378.86	12-15-18-21-24-26-29-32-36	
8	$349.99	FALSE	5	TRUE	500	0.0825	FALSE	$378.86	12-15-18-21-24-26-29-32-33-36	MCDC FFTF
9	$349.99	FALSE	5	TRUE	501	0.0825	TRUE	$378.86	12-15-18-21-24-26-29-32-33-34-36	MCDC FFTT
10	$5,000.00	FALSE	5	FALSE	501	0.0825	FALSE	$4,600.63	-	MCDC FFFT
11	$5,000.00	TRUE	0	TRUE	500	0.0825	TRUE	$4,600.63	-	Extreme range test for yearsMember
12	$5,000.01	TRUE	50	TRUE	501	0.0825	TRUE	$4,330.01	-	Extreme range test for yearsMember
13	$1,250.00	TRUE	6	FALSE	1	0.0825	TRUE	$1,285.47	-	Extreme range test for safetyRating
14	$1,999.99	TRUE	5	FALSE	999	0.0825	TRUE	$1,948.49	-	Extreme range test for safetyRating
15	$0.00	TRUE	6	TRUE	501	0.0825	TRUE	$0.00	-	Extreme range test for premium
16	$10,000.00	TRUE	5	TRUE	501	0.0825	TRUE	$8,660.00	-	Extreme range test for premium

Code coverage achieved is: full boundary coverage, full statement coverage, full decision coverage and extreme range coverage.

The test cases support the description (logical expression).

Cyclomatic complexity = 9



Question 3

Decision table:

	Rule 1	**Rule 2**	**Rule 3**	**Rule 4**
Conditions				
200.0 <= distance (feet) <= 1,000.0	Y			
100.1 <= distance (feet) <= 199.9		Y		
75.0 <= distance (feet) <= 100.0			Y	
0.0 <= distance (feet) <= 74.9				Y
Actions				
greenLight	TRUE	FALSE	FALSE	FALSE
yellowLight	FALSE	TRUE	FALSE	FALSE
redLight	FALSE	FALSE	TRUE	TRUE
caution	FALSE	FALSE	TRUE	FALSE
warning	FALSE	FALSE	FALSE	TRUE
Table implements "first-of" rule				

Test case table:

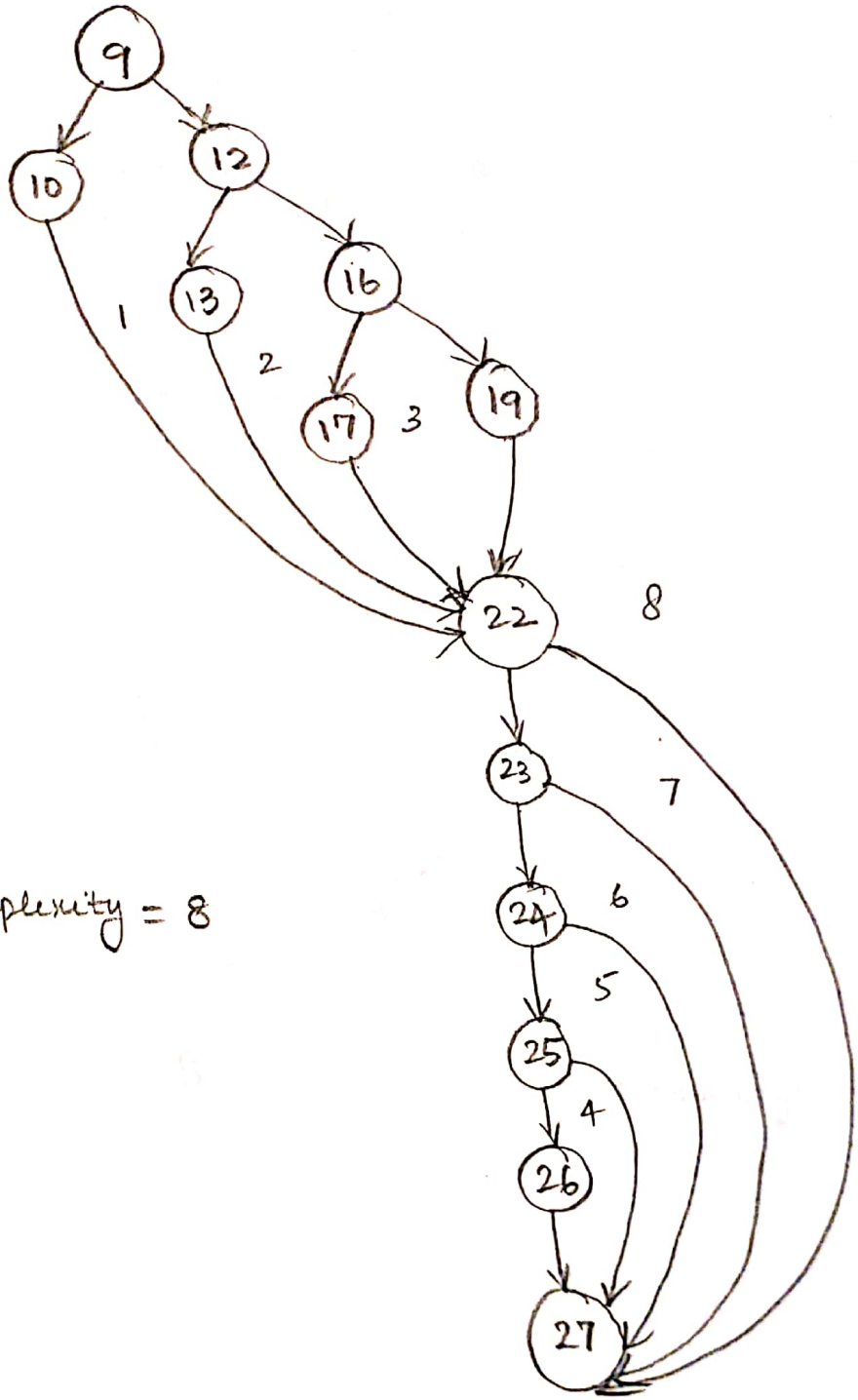
Test Case Number	Inputs			Expected Outputs						Basis Path	MCDC stmt 22-26
	distance (ft.)	cruise Requested	speed (mph)	redLight	yellow Light	greenLight	caution	warning	cruiseEngaged		
1	200.0	TRUE	40.1	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	9-10-22-23-24-25-26-27	
2	100.1	FALSE	40.1	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	9-12-13-22-27	
3	75.0	FALSE	40.1	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	9-12-16-17-22-27	

4	74.9	FALSE	40.1	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	9-12-16-19-22-27	
5	49.9	TRUE	40.1	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	9-12-16-19-22-23-27	TFTT
6	50.0	TRUE	40.0	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	9-12-16-19-22-23-24-27	TTFT
7	50.0	TRUE	65.1	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	9-12-16-19-22-23-24-25-27	TTTF
8	50.0	TRUE	65.0	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE	9-12-16-19-22-23-24-25-26-27	TTTT
9	50.0	FALSE	40.1	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	Missing MCDC	FTTT

10	0.0	TRUE	65.0	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	Extreme range test for distance	
11	1,000.00	TRUE	65.1	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	Extreme range test for distance	
12	199.9	TRUE	0.0	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	Extreme range test for speed	
13	100.0	TRUE	100.0	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE	Extreme range test for speed	

Code coverage achieved is: full boundary coverage, full statement coverage, full decision coverage and extreme range coverage.

The test cases support the description (logical expression).



Cyclomatic complexity = 8

Question 4

Decision table:

	Rule 1	**Rule 2**	**Rule 3**	**Rule 4**
Conditions				
landing	FALSE	TRUE	TRUE	TRUE
0.0 <= speed (mph) <= 149.9				Other values
150.0 <= speed (mph) <= 500.0		Y		
500.1 <= speed (mph) <= 1,000.0			Y	
0.0 <= altitude (feet) <= 1,000.0				
1,000.1 <= altitude (feet) <= 2,499.9		Y		
2,500.0 <= altitude (feet) <= 4,999.9			Y	
5,000.0 <= altitude (feet) <= 10,000.0				
Actions				
action	disengageRetro	deployPods	engageRetro	orbit
Table implements "first-of" rule				

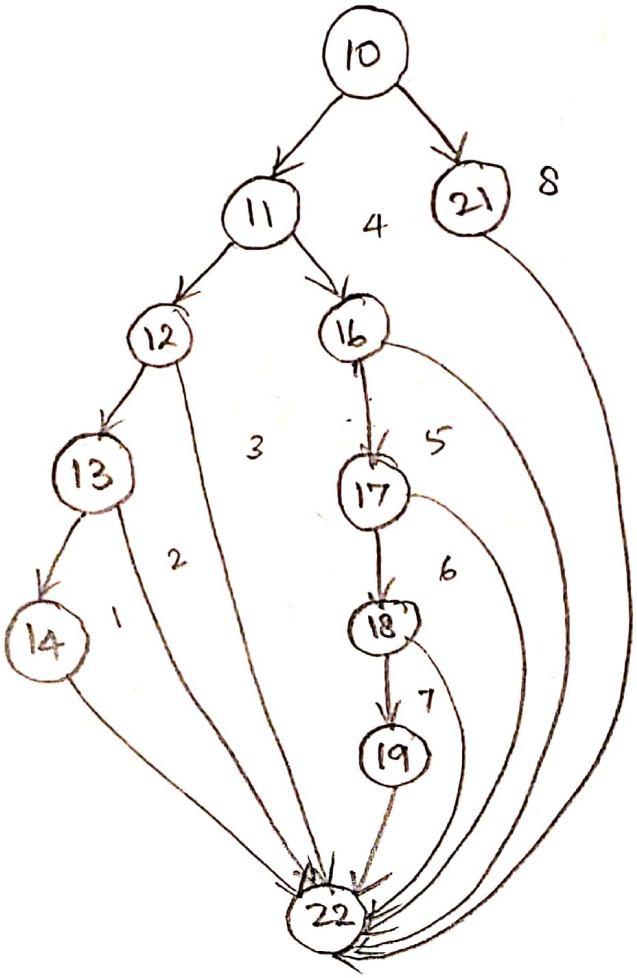
Test case table:

Test Case Number	Inputs			Exp Out	Basis Path	MCDC	Comments
	landing	speed (mph)	altitude (ft.)	return			
1	TRUE	500.1	2,500.0	engageRetro	10-11-12-13-14-22	stmt 11-14 TTT	
2	FALSE	500.1	2,500.0	disengageRetro	10-21-22		
3	TRUE	500.1	2,499.9	orbit	10-11-12-22	stmt 11-14 TFT	
4	TRUE	149.9	2,499.9	orbit	10-11-16-22		
5	TRUE	500.1	5,000.0	orbit	10-11-12-13-22	stmt 11-14 TTF	
6	TRUE	150.0	1,000.0	orbit	10-11-16-17-22	stmt 16-19 TFT	
7	TRUE	150.0	2,500.0	orbit	10-11-16-17-18-22	stmt 16-19 TTF	
8	TRUE	150.0	1,000.1	deployPods	10-11-16-17-18-19-22	stmt 16-19 TTT	
9	TRUE	0.0	1,000.1	orbit	-		Extreme range test for speed
10	TRUE	1,000.0	1,000.1	orbit	-		Extreme range test for speed
11	TRUE	1000.0	0.0	orbit	-		Extreme range test for altitude

12	TRUE	1,000.0	10,000.0	orbit	-		Extreme range test for altitude
13	FALSE	500.1	4,999.9	disengageRetro	-	stmt 11-14 FTT	Missing MCDC
14	FALSE	149.9	1,000.1	disengageRetro	-	stmt 16-19 FTT	Missing MCDC

Code coverage achieved is: full boundary coverage, full statement coverage, full decision coverage and extreme range coverage.

The test cases support the description (logical expression).



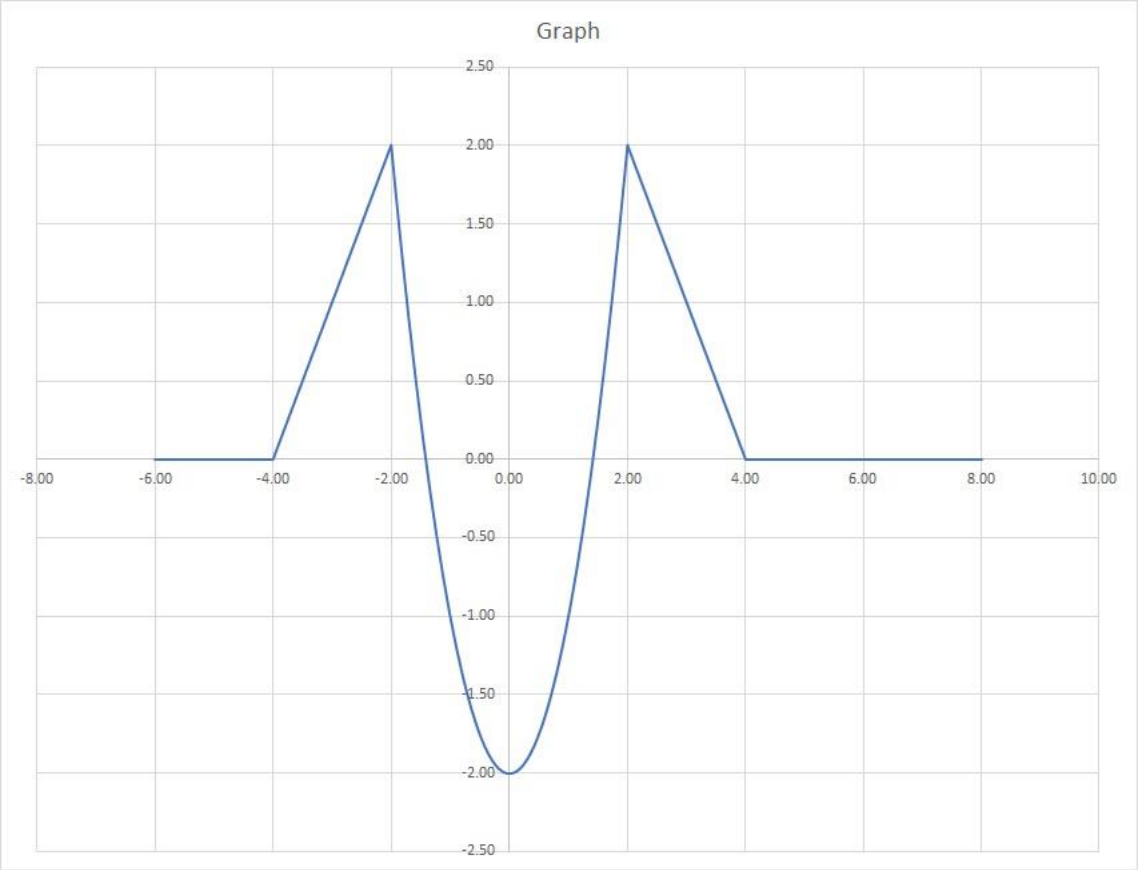
Cyclomatic complexity = 8

Question 5

Test case table:

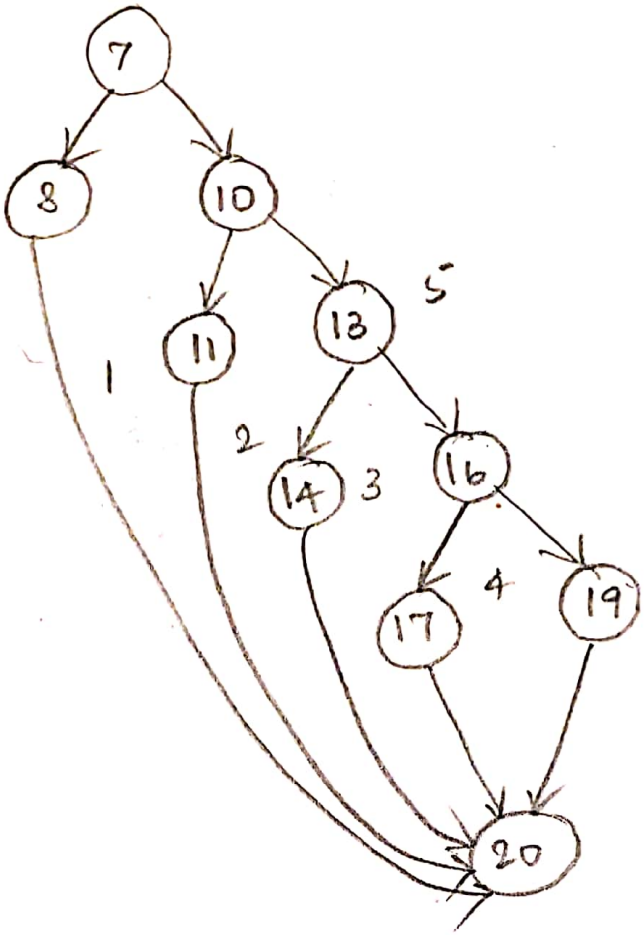
Test Case Number	Inputs	Exp Out	Basis Path Tested	Comments
	x	y		
1	-4.01	0.00	7-8-20	
2	-2.00	2.00	7-10-11-20	
3	1.99	1.96	7-10-13-14-20	
4	3.99	0.01	7-10-13-16-17-20	
5	4.00	0.00	7-10-13-16-19-20	
6	-6.00	0.00	-	Extreme range test
7	8.00	0.00	-	Extreme range test
8	-1.99	1.96	-	Missing BVs
9	2.00	2.00	-	Missing BVs
10	-4.00	0.00	-	Missing BVs
11	-3.00	1.00	-	mid of linear region
12	3.00	1.00	-	mid of linear region
13	0.00	-2.00	-	max of parabola region
14	-1.00	-1.00	-	mid point of min/max

Graph:



Code coverage achieved is: full boundary coverage, full statement coverage, full decision coverage and extreme range coverage.

The test cases support the description (logical expression).



Cyclomatic complexity = 5