

Question 1: A mobile phone service provider uses a program that computes the monthly bill customers as follows:
Minimum Rs 300 for up to 120 calls.

plus, Rs 1 Per call for the next 20 calls.

plus, Rs 0.80 Per call for the next 50 calls.

plus, Rs 0.40 Per call for any call beyond 220 calls.

Design test cases for this program

Solution: Let variable A for number of phone calls.
first, we partition the domain of input's as valid input values and invalid values, getting the following classes:

$$I_1 = \{ \langle A \rangle : 1 \leq A \leq 120 \}$$

$$I_2 = \{ \langle A \rangle : 121 \leq A \leq 190 \}$$

$$I_3 = \{ \langle A \rangle : 191 \leq A \leq 220 \}$$

$$I_4 = \{ \langle A \rangle : A \geq 220 \}$$

$$I_5 = \{ \langle A \rangle : A < 0 \}$$

→ Now these test cases can be designed from the above derived classes, taking one test case from each class, such that the test cases covers maximum valid input classes and separate test cases for each Invalid class.

→ The test cases are shown below:

Test Case ID	Input value A	Expected Output	Classes covered by the test cases
1	90	300 Rn	1
2	145	325 Rn	12
3	210	342 Rn	13
4	250	352 Rn	14
5	-2	invalid	15

Question 2: A Program reads players record with the following detail and prints a team-wise list containing player name with their batting average.

Player name (max 30 characters)

Team name (max 20 characters)

Batting average

Design test cases for this program using BVC, robust testing and worst-case testing methods.

Solution: @ Test cases using BVC since there are three variables player name and batting average but there is no boundary for batting average values. so the total number variable is 2 and total number of test cases will be $4m+1=9$

The set of boundaries value shown below.

→ for player name,

Min value = 1 character

Min⁺ value = 2 "

Max value = 30 "

Max⁻ value = 29 "

Nominal value = 15 "

→ for team name

Min value = 1 character

Min⁺ value = 2 "

Max value = 20 "

Max⁻ value = 19 "

Nominal value = 10 "

⑥ Test cases using robust testing. Since there are two variables player name and team name, the total number of test cases will be $6n+1 = 13$

The set of boundary values is shown below:

→ for player name

Min value = 1 character.

Min⁺ value = 2 character.

Min⁻ value = 0 or null character.

Max value = 30 character.

Max⁺ value = 31 character.

Max⁻ value = 29 character.

Nominal value = 15 character.

→ for the team name.

Min value = 1 character.

Min⁺ value = 2 character.

Min⁻ value = 0 or Null character.

Max value = 20 character.

Max⁺ value = 21 character.

Max⁻ value = 19 character.

Nominal value = 20 character.

© Test cases using worst case testing. Since there are two variables, player name and team name, the total num of test case will be $5^n = 25$

Test Case ID	Player name	length P.name	Team name	length T.name	Batting avg.	Expected Output
1	R	1	Comillruders	10	44	Print (Player and team name which average)
2	Ra	2	Pinpointgk	10	44	"
3	ababababab ababababab ababababab	30	Pakabikoth	20	34	"
4	myname in md mynuddin any Problemme	29	Abutowhamo	10	44	"
5	ababababab bkhva	15	R	4	5	"
6	Damar noner bondh	15	Mm	2	44	"
7	Sibojikelba gkh	14	Khelarikak hilaruamkh	20	54	"
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

Question 3: A University is admitting students in a professional course subject to the following conditions:

③ Mark in Java ≥ 70

⑥ Mark in c++ ≥ 60

⑦ Marks in OOAD ≥ 60

⑧ Total in all three subjects ≥ 220 OR total in Java and c++ ≥ 150

If the aggregate mark of an eligible candidate more than 240, he will be eligible for scholarship course, otherwise he will be eligible for normal course. The programme reads the marks in three subjects and generates the following outputs:

① Not eligible

② Eligible for scholarship course.

③ Eligible for normal course.

Design test case for this programme using equivalence class testing technique.

Solution: let variable J for marks java.

C for marks c++, O for marks in OOAD

first we partition the domain of input or valid input values and invalid values getting the following classes:

$$I_1 = \{ \langle J \rangle : J \geq 20 \}$$

$$I_2 = \{ \langle C \rangle : C \geq 60 \}$$

$$I_3 = \{ \langle O \rangle : O \geq 60 \}$$

$$I_4 = \{ \langle J, C, O \rangle : J + C + O \geq 220 \}$$

$$I_5 = \{ \langle J, C \rangle : J + C \geq 150 \}$$

$$I_6 = \{ \langle J, C, O \rangle : J + C + O \geq 240 \}$$

$$I_7 = \{ \langle J \rangle : J < 70 \}$$

$$I_8 = \{ \langle C \rangle : C < 60 \}$$

$$I_9 = \{ \langle O \rangle : O < 60 \}$$

$$I_{10} = \{ \langle J, C, O \rangle : J+C+O < 220 \}$$

$$I_{11} = \{ \langle J, C \rangle : J+C < 150 \}$$

$$I_{12} = \{ \langle J, C, O \rangle : J+C+O < 240 \}$$

Test Case ID	Java(J)	C++(C)	OOAD(O)	Expected Output	Courses covered by the test case
1	90	60	60	Eligible for Normal course	1, 12, 13, 15, 110, 112
2	90	60	80	"	1, 12, 13, 14, 112
3	90	80	90	Eligible for scholarship course	1, 12, 13, 14, 15, 16
4	50	80	90	Not eligible	17, 12, 13, 111, 110, 112
5	90	50	90	"	18, 11, 13, 111, 110, 112
6	80	80	50	"	11, 12, 19, 111, 110, 112
7	70	60	80	"	11, 12, 13, 111, 110, 112