X_test Y_test

Index	Math	Science	Gender	GPA	Class	Prediction	TP	TN	FP	FN
1	100	95	female	3.9	1	1	✓			
2	25	40	female	1.8	0	1			✓	
3	30	65	male	2.5	1	0				✓
4	45	30	male	2.1	0	0		✓		
5	65	80	female	3.7	1	0				✓
6	80	85	male	3.8	1	1	✓			
7	25	30	male	2.2	0	0		✓		
8	60	65	female	2.5	1	0				✓
9	90	95	male	3.8	1	1	✓			
10	75	70	male	3.7	1	0				✓
11	35	40	female	2.1	0	1			✓	
12	30	40	male	1.8	0	0		✓		

True_Positive:
y_test=1 & prediction=1

True_Negative:
y_test!=1 & prediction!=1

False_Positive:
y_test!=1 & prediction=1

False_Negative:
y_test=1 & prediction!=1

TP=3; TN=3; FP=2; FN=4

X_test

Y_test

Index	Math	Science	Gender	GPA	Class	Prediction	TP	TN	FP	FN
1	100	95	female	3.9	1	1	✓			
2	25	40	female	1.8	0	1			✓	
3	30	65	male	2.5	1	0				✓
4	45	30	male	2.1	0	0		✓		
5	65	80	female	3.7	1	0				✓
6	80	85	male	3.8	1	1	✓			
7	25	30	male	2.2	0	0		✓		
8	60	65	female	2.5	1	0				✓
9	90	95	male	3.8	1	1	✓			
10	75	70	male	3.7	1	0				✓
11	35	40	female	2.1	0	1			✓	
12	30	40	male	1.8	0	0		✓		
							3	3	2	4

Confusion Matrix

	Prediction 1	Prediction 0
Class 1	TP=3	FP=2
Class 0	TN=3	FN=4

X_test Y_test

Index	Math	Science	Gender	GPA	Class	Prediction	TP	TN	FP	FN
1	100	95	female	3.9	1	1	✓			
2	25	40	female	1.8	0	1			✓	
3	30	65	male	2.5	1	0				✓
4	45	30	male	2.1	0	0		✓		
5	65	80	female	3.7	1	0				✓
6	80	85	male	3.8	1	1	✓			
7	25	30	male	2.2	0	0		✓		
8	60	65	female	2.5	1	0				✓
9	90	95	male	3.8	1	1	✓			
10	75	70	male	3.7	1	0				✓
11	35	40	female	2.1	0	1			✓	
12	30	40	male	1.8	0	0		✓		

TP=3; TN=3; FP=2; FN=4

$$\mathrm{P} = \text{Percision} = \frac{TP}{TP+FP} = \frac{3}{5} = 0.6$$

$$\mathrm{R} = \text{Recall} = \frac{TP}{TP+FN} = \frac{3}{7} = 0.4$$

$$F1 = 2\times\frac{P\times R}{P+R} = 2\times\frac{0.6\times0.4}{0.6+0.4} = 2\times\frac{0.24}{1} = 0.48$$