Example No # 01:

Confusion Matrix:

$$\begin{bmatrix} 14 & 0 & 0 \\ 0 & 18 & 0 \\ 0 & 1 & 14 \end{bmatrix} = \begin{bmatrix} TN & FP & TN \\ FN & TP & FN \\ TN & FP & TN \end{bmatrix}$$

$TN = 14 + 18 + 0 + 0 = 26$

$FP = 1$

$FN = 0$

$TP = 18$.

$$\text{Accuracy} = \frac{TN + TP}{TN + FN + TP + FP}$$

$$= \frac{26 + 18}{26 + 0 + 18 + 1}$$

$$= \frac{44}{45}$$

$$= 0.97 \times 100$$

Accuracy = 97.77 %

- $$\text{Recall / TPR} = \frac{TP}{TP + FN}$$

$$= \frac{18}{18 + 0} = 1 \times 100 = 100\%.$$

Recall = 100 %

- $$FPR = \frac{FP}{FP + TN}$$

$$= \frac{1}{1 + 26} = 0.037 \times 100$$

FPR = 3.70 %.

- $$TNR = \frac{TN}{TN + FP}$$

$$= \frac{26}{26 + 1} = 0.96 \times 100$$

TNR = 96.29 %.

- $$FNR = \frac{FN}{FN + TP}$$

$$= \frac{0}{0 + 18} = 0.$$

FNR = 0 %.

- $\text{Precision} = \dfrac{TP}{TP + FP}$

$$= \frac{18}{18 + 1}$$

$$= 0.94 \times 100$$

Precision = 94.73 %.

- f measure :

$$= \frac{2 \times \text{Precision} \times \text{recall}}{\text{Precision} + \text{recall}}$$

$$= \frac{2 \times 0.94 \times 1}{0.94 + 1}$$

$$= \frac{1.88}{1.94}$$

$$= 0.96 \times 100$$

~~F mean~~

F measure = 0.96 %.

Example NO #02:

Confusion Matrix:

$$\begin{bmatrix} 5 & 2 \\ 1 & 4 \end{bmatrix} = \begin{bmatrix} TN & FP \\ FN & TP \end{bmatrix}$$

$TN = 5$
$FP = 2$
$FN = 1$
$TP = 4$

- $\text{Accuracy} = \dfrac{TN + TP}{TN + FN + TP + FP}$

$= \dfrac{5 + 4}{5 + 1 + 4 + 2}$

$= \dfrac{9}{12}$

$= 0.75 \times 100$.

Accuracy = 75%

- $\text{Recall / TPR} = \dfrac{TP}{TP + FN}$

$= \dfrac{4}{4 + 1}$

$= 4/5 = 0.8$

Recall = 80%

- $FPR = \dfrac{FP}{FP + TN}$

$= \dfrac{2}{2 + 5} = 0.28 \times 100$

FPR = 28.57%

- $TNR = \dfrac{TN}{TN + FP}$

$= \dfrac{5}{5 + 2} = 0.71 \times 100$

TNR = 71.42%

- $FNR = \dfrac{FN}{FN + TP}$

$= \dfrac{1}{1 + 4} = 0.2 \times 100$

FNR = 20%

- Precision $= \frac{TP}{TP + FP}$

$= \frac{4}{4 + 2}$

$= 0.66 \times 100$

$= 66.66\%$

- F measure:

$= \frac{2 \times \text{Precision} \times \text{recall}}{\text{Precision} + \text{recall}}$

$= \frac{2 \times 0.66 \times 0.8}{0.66 + 0.8}$

$= \frac{1.056}{1.46}$

$= 0.72$

F1 score = 72.32%