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1.

Classification Table:

Precision:

We know,

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

∴ Precision of Iris-setosa $P_A = \frac{13}{13+0} = \frac{13}{13} = 1$

∴ Precision of Iris-versicolor, $P_B = \frac{15}{15+1} = \frac{15}{16} = 0.94$

∴ Precision of Iris-Virginica, $P_C = \frac{12}{12+1} = \frac{12}{13} = 0.92$

Recall:

We know,

$$\text{Recall} = \frac{TP}{TP+FN}$$

∴ Recall of Iris-Setosa, $R_A = \frac{13}{13+1} = \frac{13}{14} = 0.93$

∴ Recall of Iris-versicolor, $R_B = \frac{15}{15+1} = \frac{15}{16} = 0.94$

∴ Recall of Iris-Virginica, $R_C = \frac{12}{12+3} = \frac{12}{15} = 0.80$

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~~We know~~, Macro Average:

Here,

$$\text{Macro Avg (Precision)} = \frac{P_A + P_B + P_3}{3}$$

$$= \frac{1 + 0.79 + 0.92}{3}$$

$$= 0.90$$

Weighted Average:

We know,

$$\text{weighted average, } W = \frac{\sum_{i=1}^{n} w_i x_i}{\sum_{i=1}^{n} w_i}$$

here, $n$ = number of terms to be averaged

$w_i$ = weight applied to $x$ values

$x_i$ = data values to be averaged

$$\therefore \text{weighted average of Precision} = \frac{1 \times 14 + 0.79 \times 16 + 0.92 \times 15}{45}$$

$$= \frac{40.44}{45}$$

$$= 0.90$$

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∴ Macro Avg of recall = $\frac{R_A + R_B + R_C}{3}$

$= \frac{0.93 + 0.94 + 0.80}{3}$

$= 0.89$

∴ weighted Avg of recall = $\frac{0.93 \times 14 + 0.94 \times 16 + 0.80 \times 15}{45}$

$= \frac{40.06}{45}$

$= 0.89$

F1-score:

We know,

$$F_1\text{-score} = 2 \times \frac{\text{Precision} \times \text{recall}}{\text{Precision} + \text{recall}}$$

∴ $F_1$-score of Iris-setosa = $2 \times \frac{1 \times 0.93}{1 + 0.93} = 0.96$

∴ $F_1$-score of Iris-vericolor = $2 \times \frac{0.79 \times 0.94}{0.79 + 0.94} = 0.86$

∴ $F_1$-score of Iris-virginica = $2 \times \frac{0.92 \times 0.80}{0.92 + 0.80} = 0.86$

∴ weighted Avg of $F_1$-score = $\frac{0.96 \times 14 + 0.86 \times 16 + 0.86 \times 15}{45}$

$= \frac{40.1}{45}$

$= 0.89$

macro avg of $f_1$-score $= \frac{0.96 + 0.86 + 0.86}{3}$

$= 0.89$

Accuracy:

∴ ~~As~~ We know,

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

$$= \frac{13 + 15 + 12}{45}$$

$$= 0.88888$$