A.

= 0.44

True

= 0.44

Gini = = 0.56

B.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Humidity(sorted) | 87.5 | 88.5 | 95 | 101.5 | 102.5 | 104 |
| Yes | <= >   |  |  | | --- | --- | | 0 | 4 | | <= >   |  |  | | --- | --- | | 1 | 3 | | <= >   |  |  | | --- | --- | | 1 | 3 | | <= >   |  |  | | --- | --- | | 1 | 3 | | <= >   |  |  | | --- | --- | | 2 | 2 | | <= >   |  |  | | --- | --- | | 4 | 0 | |
| No | |  |  | | --- | --- | | 0 | 5 | | |  |  | | --- | --- | | 1 | 4 | | |  |  | | --- | --- | | 2 | 3 | | |  |  | | --- | --- | | 4 | 1 | | |  |  | | --- | --- | | 4 | 1 | | |  |  | | --- | --- | | 5 | 0 | |
| Gini | 0.494 | 0.491 | 0.48 | 0.344 | 0.438 | 0.494 |

C.

<=101

>101

**D.**

(<= 101)

Gini = 1-((4/5)^2+(1/5)^2) = 0.32

>101.5

<=101.5

True

False

(>101)

Gini= 1-((3/4)^2+(1/4)^2) = 0.375

>101.5

<=101.5

False

True

False

True

E .

Gini= 1-((3/4)^2+(1/4)^2) = 0.375

F.

= 0.918

= 0.918

0.918\*(6/9) = 0.612

0.918\*(3/9) = 0.306

InfoGain = 0.99 – 0.612 – 0.306 = 0.072

**G.**

1 – MAX( 6/9, 3/9 ) = 1/3

H.

Windy(true) error = 1-max(2/6,4/6 =1/3

Windy(False) error = 1-max(2/3,1/3) =1/3

Classification error rate of Windy = (6/9)(1/3) + (3/9)(1/3) = 1/3

I.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sorted values | 88 | 89 | 101 | 102 | 103 |  |
|  | 87 | 88 | 95 | 101 | 102 | 104 |
|  | |  |  | | --- | --- | | <= | > | | |  |  | | --- | --- | | <= | > | | |  |  | | --- | --- | | <= | > | | |  |  | | --- | --- | | <= | > | | |  |  | | --- | --- | | <= | > | | |  |  | | --- | --- | | <= | > | |
| Yes | |  |  | | --- | --- | | 0 | 4 | | |  |  | | --- | --- | | 1 | 3 | | |  |  | | --- | --- | | 1 | 3 | | |  |  | | --- | --- | | 1 | 3 | | |  |  | | --- | --- | | 2 | 2 | | |  |  | | --- | --- | | 4 | 0 | |
| No | |  |  | | --- | --- | | 0 | 5 | | |  |  | | --- | --- | | 1 | 4 | | |  |  | | --- | --- | | 2 | 3 | | |  |  | | --- | --- | | 4 | 1 | | |  |  | | --- | --- | | 4 | 1 | | |  |  | | --- | --- | | 5 | 0 | |
| Column Error | |  |  | | --- | --- | | 1 | 4/9 | | |  |  | | --- | --- | | 0.5 | 3/7 | | |  |  | | --- | --- | | 1/3 | 0.5 | | |  |  | | --- | --- | | 1/5 | 1/4 | | |  |  | | --- | --- | | 1/3 | 1/3 | | |  |  | | --- | --- | | 4/9 | 1 | |
| Final Error | 4/9 | 4/9 | 4/9 | **2/9** | 1/3 | 4/9 |

J.

Humidity best split = 102

Windy best split = Only one split True/False