

OUTPUT FOR TRAINING_SET.CSV

The output retrieved for the training set data is the decision tree which is shows as below.

The **Information Gain Heuristic** is as under:

```
X0 = 0 :
| XM = 0 :
| | XF = 0 :
| | | XB = 0 :
| | | | XG = 0 : 0
| | | | XG = 1 :
| | | | | XD = 0 :
| | | | | | XS = 0 : 0
| | | | | | XS = 1 :
| | | | | | | XC = 0 : 0
| | | | | | | XC = 1 :
| | | | | | | | XH = 0 : 0
| | | | | | | | XH = 1 : 1
| | | | | XD = 1 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 :
| | | | | | | XK = 0 : 0
| | | | | | | XK = 1 : 1
| | | | XB = 1 :
| | | | | XD = 0 : 0
| | | | | XD = 1 :
| | | | | | XI = 0 : 0
| | | | | | XI = 1 :
| | | | | | | XE = 0 : 0
| | | | | | | XE = 1 :
| | | | | | | XJ = 0 : 0
| | | | | | | XJ = 1 : 1
| | XF = 1 : 1
| XM = 1 :
| | XB = 0 :
| | | XD = 0 :
| | | | XC = 0 :
| | | | | XR = 0 :
| | | | | | XL = 0 : 0
| | | | | | XL = 1 :
| | | | | | | XN = 0 :
| | | | | | | | XQ = 0 : 0
| | | | | | | | XQ = 1 :
| | | | | | | | XE = 0 : 0
| | | | | | | | XE = 1 :
| | | | | | | | | XP = 0 : 0
| | | | | | | | | XP = 1 : 1
| | | | | | XN = 1 :
| | | | | | | XE = 0 : 0
| | | | | | | XE = 1 :
| | | | | | | | XT = 0 :
| | | | | | | | XU = 0 : 0
```

[illegible]

The **Variance Impurity Heuristic** is as under:

XO = 0 :

| XM = 0 :

| | XF = 0 :

| | | XB = 0 :

| | | | XG = 0 : 0

| | | | XG = 1 :

| | | | XD = 0 :

| | | | | XS = 0 : 0

| | | | | XS = 1 :

| | | | | | XC = 0 : 0

| | | | | | XC = 1 :

| | | | | | | XH = 0 : 0

| | | | | | | XH = 1 : 1

| | | | XD = 1 :

| | | | | XE = 0 : 0

| | | | | XE = 1 :

| | | | | | XK = 0 : 0

| | | | | | XK = 1 : 1

| | | XB = 1 :

| | | | XI = 0 : 0

| | | | XI = 1 :

| | | | XL = 0 :

| | | | | XN = 0 : 0

| | | | | XN = 1 :

| | | | | | XQ = 0 : 0

| | | | | | XQ = 1 : 1

| | | | XL = 1 :

| | | | | XT = 0 :

| | | | | | XJ = 0 : 0

| | | | | | XJ = 1 : 1

| | | | | | XT = 1 : 1

| | XF = 1 : 1

| XM = 1 :

| | XU = 0 :

| | | XR = 0 :

| | | | XP = 0 : 0

| | | | XP = 1 : 1

| | | XR = 1 : 1

| | XU = 1 : 1

XO = 1 : 1

OUTPUT FOR TEST SET.CSV

The **Information Gain** Heuristic is as under:

XD = 0 :

| XI = 0 :

| | XJ = 0 :

| | | XN = 0 :

| | | | XP = 0 :

| | | | | XQ = 0 :

| | | | | | XF = 0 :

| | | | | | | XL = 0 :

| | | | | | | | XG = 0 : 0

| | | | | | | | XG = 1 :

| | | | | | | | XS = 0 : 0

| | | | | | | | XS = 1 :

| | | | | | | | XK = 0 : 0

| | | | | | | | XK = 1 :

| | | | | | | | XC = 0 :

| | | | | | | | | XE = 0 : 0

| | | | | | | | | XE = 1 :

| | | | | | | | | XH = 0 : 0

| | | | | | | | | XH = 1 :

| | | | | | | | | | XM = 0 : 0

| | | | | | | | | | XM = 1 : 1

| | | | | | | | | | XC = 1 : 1

| | | | | | | | | XL = 1 : 1

| | | | | | | | | XF = 1 : 1

| | | | | | | XQ = 1 :

| | | | | | | | XC = 0 :

| | | | | | | | | XE = 0 :

| | | | | | | | | XR = 0 :

| | | | | | | | | XT = 0 :

| | | | | | | | | XO = 0 : 0

| | | | | | | | | XO = 1 : 1

| | | | | | | | | XT = 1 :

| | | | | | | | | XU = 0 : 0

| | | | | | | | | XU = 1 : 1

| | | | | | | | | XR = 1 : 1

| | | | | | | | XE = 1 :

| | | | | | | | | XB = 0 : 0

| | | | | | | | | XB = 1 : 1

| | | | | | | XC = 1 :

| | | | | | | | XB = 0 :

| | | | | | | | | XE = 0 : 0

| | | | | | | | | XE = 1 : 1

| | | | | | | | | XB = 1 : 1

| | | | | | XP = 1 :

| | | | | | | XC = 0 :

| | | | | | | | XB = 0 :

| | | | | | | | | XE = 0 : 0

| | | | | | | | | XE = 1 : 1

| | | | | | | XB = 1 :

| | | | | | | | XE = 0 : 0

| | | | | | | | XE = 1 : 1

| | | | | | XC = 1 :

```

| | | | | XB = 0 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XB = 1 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XN = 1 : 1
| | | | | XJ = 1 :
| | | | | XC = 0 :
| | | | | | XB = 0 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XB = 1 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XC = 1 :
| | | | | | XB = 0 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XB = 1 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XI = 1 :
| | | | | | XB = 0 :
| | | | | | XC = 0 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XC = 1 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XB = 1 :
| | | | | | XC = 0 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XC = 1 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XD = 1 :
| | | | | XC = 0 :
| | | | | | XE = 0 :
| | | | | | XB = 0 : 0
| | | | | | XB = 1 : 1
| | | | | XE = 1 :
| | | | | | XB = 0 : 0
| | | | | | XB = 1 : 1
| | | | | XC = 1 :
| | | | | | XB = 0 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1
| | | | | XB = 1 :
| | | | | | XE = 0 : 0
| | | | | | XE = 1 : 1

```

The **Variance Impurity** Heuristic is as under:

```

XD = 0 :
| XI = 0 :
| | XJ = 0 :
| | | XN = 0 :
| | | | XP = 0 :
| | | | | XQ = 0 :
| | | | | | XF = 0 :
| | | | | | | XL = 0 :
| | | | | | | | XG = 0 : 0
| | | | | | | | XG = 1 :
| | | | | | | | XS = 0 : 0
| | | | | | | | XS = 1 :
| | | | | | | | XK = 0 : 0
| | | | | | | | XK = 1 :
| | | | | | | | | XC = 0 :
| | | | | | | | | | XE = 0 : 0
| | | | | | | | | | XE = 1 :
| | | | | | | | | | | XH = 0 : 0
| | | | | | | | | | | XH = 1 :
| | | | | | | | | | | | XM = 0 : 0
| | | | | | | | | | | | XM = 1 : 1
| | | | | | | | | | | | XC = 1 : 1
| | | | | | | | | | | | XL = 1 : 1
| | | | | | | | | | | | XF = 1 : 1
| | | | | | | | | | | | XQ = 1 :
| | | | | | | | | | | | XO = 0 :
| | | | | | | | | | | | | XU = 0 :
| | | | | | | | | | | | | | XT = 0 : 0
| | | | | | | | | | | | | | XT = 1 :
| | | | | | | | | | | | | | | XR = 0 : 0
| | | | | | | | | | | | | | | XR = 1 : 1
| | | | | | | | | | | | | | | XU = 1 : 1
| | | | | | | | | | | | | | | XO = 1 :
| | | | | | | | | | | | | | | | XB = 0 : 0
| | | | | | | | | | | | | | | | XB = 1 : 1
| | | | | | | | | | | | | | | | XP = 1 : 1
| | | | | | | | | | | | | | | | XN = 1 : 1
| | | | | | | | | | | | | | | | XJ = 1 : 1
| | | | | | | | | | | | | | | | XI = 1 : 1
XD = 1 : 1

```

OUTPUT FOR VALIDATION_SET.CSV

The **Information Gain** Heuristic is as under:

```
XI = 0 :
| XU = 0 :
| | XN = 0 :
| | | XC = 0 :
| | | | XF = 0 :
| | | | | XO = 0 :
| | | | | | XG = 0 : 0
| | | | | | XG = 1 :
| | | | | | | XD = 0 : 0
| | | | | | | XD = 1 :
| | | | | | | | XP = 0 :
| | | | | | | | XL = 0 : 0
| | | | | | | | XL = 1 : 1
| | | | | | | | XP = 1 : 1
| | | | | XO = 1 :
| | | | | | XB = 0 :
| | | | | | | XR = 0 :
| | | | | | | | XS = 0 : 0
| | | | | | | | XS = 1 : 1
| | | | | | | | XR = 1 : 1
| | | | | | XB = 1 :
| | | | | | | XT = 0 :
| | | | | | | | XH = 0 :
| | | | | | | | | XK = 0 : 0
| | | | | | | | | XK = 1 :
| | | | | | | | | | XQ = 0 :
| | | | | | | | | | | XE = 0 : 0
| | | | | | | | | | | XE = 1 :
| | | | | | | | | | | | XD = 0 : 0
| | | | | | | | | | | | XD = 1 :
| | | | | | | | | | | | | XJ = 0 : 0
| | | | | | | | | | | | | XJ = 1 :
| | | | | | | | | | | | | | XM = 0 : 0
| | | | | | | | | | | | | | XM = 1 : 1
| | | | | | | | | | | XQ = 1 : 1
| | | | | | | | | XH = 1 :
| | | | | | | | | | XD = 0 :
| | | | | | | | | | | XE = 0 : 0
| | | | | | | | | | | XE = 1 : 1
| | | | | | | | | | XD = 1 : 1
| | | | | | | | XT = 1 :
| | | | | | | | | XD = 0 :
| | | | | | | | | | XE = 0 : 0
| | | | | | | | | | XE = 1 : 1
| | | | | | | | | XD = 1 :
| | | | | | | | | | XE = 0 : 0
| | | | | | | | | | XE = 1 : 1
| | | | | XF = 1 :
| | | | | | XB = 0 :
| | | | | | | XD = 0 :
| | | | | | | | XE = 0 : 0
| | | | | | | | XE = 1 : 1
```

```

| | | | XD = 1 :
| | | | XE = 0 : 0
| | | | XE = 1 : 1
| | | | XB = 1 : 1
XC = 1 :
| | | | XD = 0 :
| | | | XB = 0 :
| | | | XE = 0 : 0
| | | | XE = 1 : 1
| | | | XB = 1 :
| | | | XE = 0 : 0
| | | | XE = 1 : 1
| | | | XD = 1 :
| | | | XE = 0 : 0
| | | | XE = 1 :
| | | | XB = 0 : 0
| | | | XB = 1 : 1
XN = 1 :
| | | | XB = 0 :
| | | | XE = 0 :
| | | | XD = 0 :
| | | | XC = 0 : 0
| | | | XC = 1 : 1
| | | | XD = 1 :
| | | | XC = 0 : 0
| | | | XC = 1 : 1
| | | | XE = 1 :
| | | | XD = 0 :
| | | | XC = 0 : 0
| | | | XC = 1 : 1
| | | | XD = 1 :
| | | | XC = 0 : 0
| | | | XC = 1 : 1
XB = 1 :
| | | | XD = 0 :
| | | | XC = 0 :
| | | | XE = 0 : 0
| | | | XE = 1 : 1
| | | | XC = 1 :
| | | | XE = 0 : 0
| | | | XE = 1 : 1
| | | | XD = 1 :
| | | | XE = 0 :
| | | | XC = 0 : 0
| | | | XC = 1 : 1
| | | | XE = 1 :
| | | | XC = 0 : 0
| | | | XC = 1 : 1
XU = 1 :
| | | | XC = 0 :
| | | | XD = 0 :
| | | | XE = 0 :
| | | | XB = 0 : 0
| | | | XB = 1 : 1
| | | | XE = 1 :

```


				XB = 0 : 0
				XB = 1 : 1
			XD = 1 :	
				XB = 0 :
				XE = 0 : 0
				XE = 1 : 1
				XB = 1 :
				XE = 0 : 0
				XE = 1 : 1
			XC = 1 :	
				XD = 0 :
				XB = 0 :
				XE = 0 : 0
				XE = 1 : 1
				XB = 1 :
				XE = 0 : 0
				XE = 1 : 1
			XD = 1 :	
				XB = 0 :
				XE = 0 : 0
				XE = 1 : 1
				XB = 1 :
				XE = 0 : 0
				XE = 1 : 1
XI = 1 :				
			XD = 0 :	
				XB = 0 :
				XC = 0 :
				XE = 0 : 0
				XE = 1 : 1
				XC = 1 :
				XE = 0 : 0
				XE = 1 : 1
				XB = 1 :
				XC = 0 :
				XE = 0 : 0
				XE = 1 : 1
				XC = 1 :
				XE = 0 : 0
				XE = 1 : 1
			XD = 1 :	
				XC = 0 :
				XB = 0 :
				XE = 0 : 0
				XE = 1 : 1
				XB = 1 :
				XE = 0 : 0
				XE = 1 : 1
				XC = 1 :
				XB = 0 :
				XE = 0 : 0
				XE = 1 : 1
				XB = 1 :
				XE = 0 : 0
				XE = 1 : 1

The **Variance Impurity** Heuristic is as under:

XI = 0 :

| XU = 0 :

| | XN = 0 :

| | | XC = 0 :

| | | | XF = 0 :

| | | | | XO = 0 :

| | | | | | XG = 0 : 0

| | | | | | XG = 1 :

| | | | | | | XB = 0 :

| | | | | | | | XR = 0 :

| | | | | | | | | XS = 0 : 0

| | | | | | | | | XS = 1 :

| | | | | | | | | | XK = 0 :

| | | | | | | | | | | XD = 0 : 0

| | | | | | | | | | | XD = 1 :

| | | | | | | | | | | | XE = 0 : 0

| | | | | | | | | | | | XE = 1 : 1

| | | | | | | | | | | | | XK = 1 : 1

| | | | | | | | | | | | | | XR = 1 : 1

| | | | | | | | | | | | | | XB = 1 : 1

| | | | | | | | | | | | | | XO = 1 :

| | | | | | | | | | | | | | | XL = 0 :

| | | | | | | | | | | | | | | | XH = 0 :

| | | | | | | | | | | | | | | | | XM = 0 : 0

| | | | | | | | | | | | | | | | | XM = 1 :

| | | | | | | | | | | | | | | | | | XJ = 0 :

| | | | | | | | | | | | | | | | | | XQ = 0 :

| | | | | | | | | | | | | | | | | | | XP = 0 : 0

| | | | | | | | | | | | | | | | | | | XP = 1 :

| | | | | | | | | | | | | | | | | | | | XT = 0 : 0

| | | | | | | | | | | | | | | | | | | | XT = 1 : 1

| | | | | | | | | | | | | | | | | | | | XQ = 1 : 1

| | | | | | | | | | | | | | | | | | | | XJ = 1 : 1

| | | | | | | | | | | | | | | | | | | | XH = 1 : 1

| | | | | | | | | | | | | | | | | | | | XL = 1 : 1

| | | | | | | | | | | | | | | | | | | | XF = 1 : 1

| | | | | | | | | | | | | | | | | | | | XC = 1 : 1

| | | | | | | | | | | | | | | | | | | | XN = 1 : 1

| | | | | | | | | | | | | | | | | | | | XU = 1 : 1

| | | | | | | | | | | | | | | | | | | | XI = 1 : 1