Decision trees

Past Trend	Open Interest	Trading Volume	Return
Positive	Low	High	Up
Negative	High	Low	Down
Positive	Low	High	Up
Positive	High	High	Up
Negative	Low	High	Down
Positive	Low	Low	Down
Negative	High	High	Down
Negative	Low	High	Down
Positive	Low	Low	Down
Positive	High	High	Up

$$GiniIndex = 1 - \sum_j p_j^2$$

0 : there exists only one class
1 : Elements are randomly distributed across various classes.

P(Past Trend=Positive): 6/10
P(Past Trend=Negative): 4/10

If (Past Trend = Positive & Return = Up), probability = 4/6
If (Past Trend = Positive & Return = Down), probability = 2/6
Gini index(Positive) = 1 - ((4/6)^2 + (2/6)^2) = 0.45

If (Past Trend = Negative & Return = Up), probability = 0
If (Past Trend = Negative & Return = Down), probability = 4/4
Gini index(Negative) = 1 - ((0)^2 + (4/4)^2) = 0

Weighted sum of the Gini Indices :
Gini Index for Past Trend = (6/10)0.45 + (4/10)0 = 0.27

Attributes/Features	Gini Index
Past Trend	0.27
Open Interest	0.47
Trading Volume	0.34

'Past Trend' has the **lowest** Gini Index

Past Trend	Open Interest	Trading Volume	Return
Positive	Low	High	Up
Positive	Low	High	Up
Positive	High	High	Up
Positive	Low	Low	Down
Positive	Low	Low	Down
Positive	High	High	Up

Attributes/Features	Gini Index
Open Interest	0.33
Trading Volume	0

We will split the node further using the **'Trading Volume'** feature,