Decision Tree
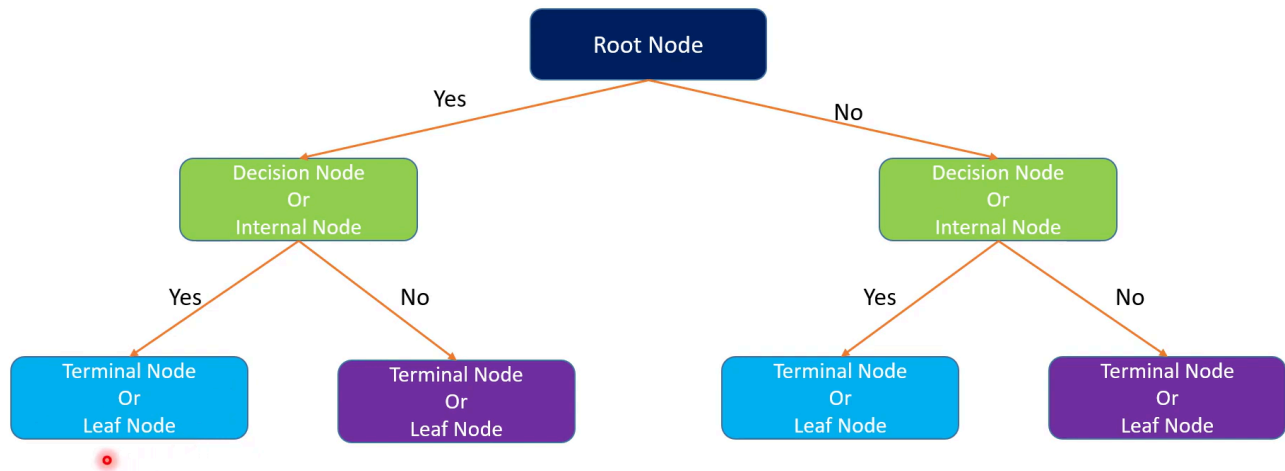
About Decision Tree model:

1. Supervised Learning Model

2. Used for both Classification & Regression

3. Builds Decision Nodes at each step

4. Basis of Tree-based models

```
                        ┌──────────────┐
                        │  Root Node   │
                        └──────────────┘
              Yes          ╱        ╲          No
          ┌──────────────┐            ┌──────────────┐
          │ Decision Node│            │ Decision Node│
          │      Or      │            │      Or      │
          │ Internal Node│            │ Internal Node│
          └──────────────┘            └──────────────┘
         Yes  ╱      ╲  No           Yes  ╱      ╲  No
  ┌────────────┐ ┌────────────┐ ┌────────────┐ ┌────────────┐
  │Terminal Node│ │Terminal Node│ │Terminal Node│ │Terminal Node│
  │     Or      │ │     Or      │ │     Or      │ │     Or      │
  │  Leaf Node  │ │  Leaf Node  │ │  Leaf Node  │ │  Leaf Node  │
  └────────────┘ └────────────┘ └────────────┘ └────────────┘
```

think as an inverted tree and it keeps going until it reaches a point.

Advantages:

1. Can be used for both Classification & Regression
2. Easy to interpret
3. No need for normalization or scaling
4. Not sensitive to outliers

Disadvantages:

1. Overfitting issue
2. Small changes in the data alter the tree structure causing instability
3. Training time is relatively higher

Decision Trees are not affected by outliers