**Decision Trees-**  
  
Definition(s):   
-A decision tree is a graph that uses a branching method to illustrate every possible outcome of a decision.  
(<http://whatis.techtarget.com/definition/decision-tree>)

-A decision tree is a flowchart-like diagram that shows the various outcomes from a series of decisions. It can be used as a decision-making tool, for research analysis, or for planning strategy. A primary advantage for using a decision tree is that it is easy to follow and understand.

(<https://www.smartdraw.com/decision-tree/#whatisDecisionTree>)

-Decision Trees (DTs) are a non-parametric supervised learning method used for [classification](http://scikit-learn.org/stable/modules/tree.html#tree-classification) and [regression](http://scikit-learn.org/stable/modules/tree.html#tree-regression).

-A decision tree is a structure that includes a root node, branches, and leaf nodes. Each internal node denotes a test on an attribute, each branch denotes the outcome of a test, and each leaf node holds a class label. The topmost node in the tree is the root node.

<https://www.tutorialspoint.com/data_mining/dm_dti.htm>

When is it used?

-The goal is to create a model that predicts the value of a target variable by learning simple decision rules inferred from the data features.  
-Evaluate all possible decisions that can be made for certain scenarios  
-Game Theory (Expected Value evaluation depending on what decisions could be made in the future)

Identify what kind of data this technique/method requires -

-Able to handle both numerical and categorical data. Other techniques are usually specialised in analysing datasets that have only one type of variable.

-Able to handle multi-output problems.

#### Confidence and Support: Confidence and support are properties of rules for decision trees. These statistical measures can be used to rank the rules and hence the predictions. Support: The number of records in the training data set that satisfy the rule. Confidence: The likelihood of the predicted outcome, given that the rule has been satisfied.

Starter list of Resources -  
Online Tutorial (analyzing probablities of events within healthcare field)- <http://openonlinecourses.com/decisionanalysis/DecisionTrees.asp>

Quick-R Tutorial -

(<https://www.statmethods.net/advstats/cart.html>)

IBM Knowledge Center Resources -

(<https://www.ibm.com/support/knowledgecenter/en/search/decision%20trees?scope=SSLVMB_20.0.0>)

Game Theory Decision Processes (PowerPoint slides)-  
<http://www.cse.cuhk.edu.hk/~cslui/CSC6480/simple_decision_processes.pdf>