

# Data Science

CS301

Let's Have A Group Project!

Activity 08

Week 11

Fall 2024

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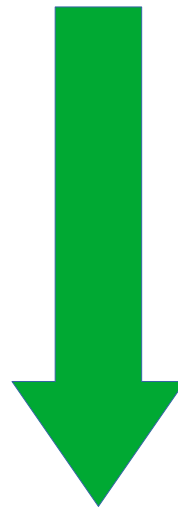
# Overview

## Building Decision Trees

- Break into groups of two or three people to complete the project
- Build a decision tree to make some involved decision from everyday life
- Three decision nodes to split data

Where to eat?  
Can I afford it?

Should my team play  
against that other team?  
How does my team  
compare to their team?



Should I call my friend  
who keeps me on the  
phone for hours? I have  
work tomorrow...

What major should I choose?  
Are these instructors cool?

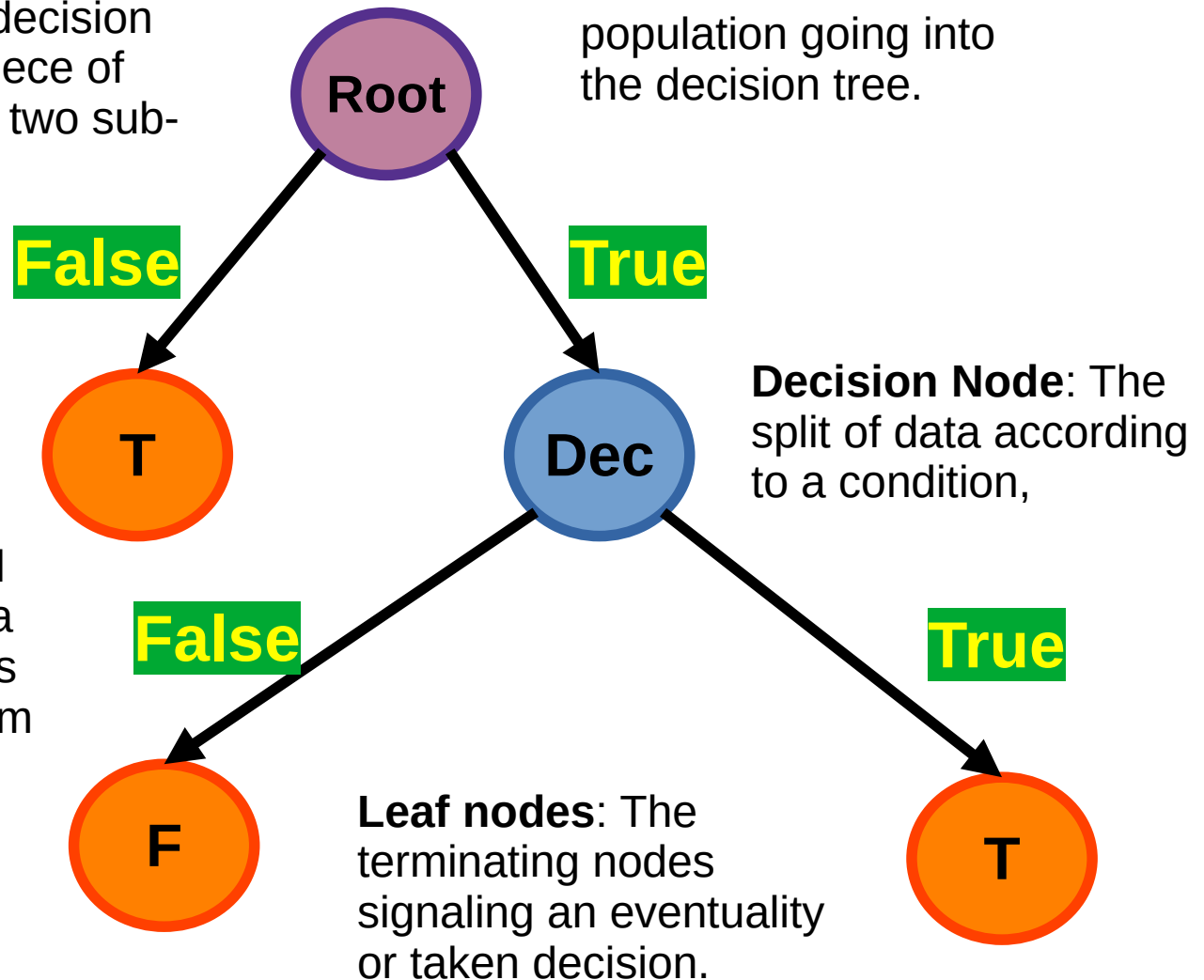


# Decision Tree

Your tree must have all these parts

**Node Splitting:** After a decision of True or False, the a piece of data must go into one of two sub-nodes,

**Root Node:** The entire population going into the decision tree.





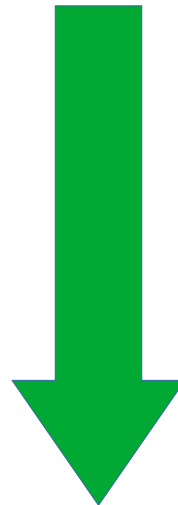
# Group Work

## Create

- Must have the following in your work
  - A general question that will make categories of outcomes
  - Data: Create at least five (5) rows
  - Three (3) decision nodes to split the data
  - An example output of the categories made after splitting
  - Try different orders of the decision nodes to check where the categories are the most *pure* (same outcomes at each leaf). Which decision node seems better at splitting data?

Should I invite  
grandmother to the  
rock concert tonight?

Who should I invite to the  
party? Bob bugs Barbara.




Should I run for public  
office? Do I have the  
right experience?

Which classes should I take as  
electives? Will I enjoy the subjects?



# Lightning Talk: Preparation

- Work together to draw the tree for your slides
- Add and label the decision nodes
- Perform the analysis of data splitting by the tree
- Compare orders of decision nodes in the tree
- Describe which question(s) seem(s) to be best at determining potential decisions. Note: not all decision nodes have same value in the tree for splitting data. Which question is best? Does your group accept the results?



Should I eat before the event?  
Five bowls of spaghetti  
followed by tap-dancing  
seems like a good idea, right?

Should I take the internship in  
another state? What about my  
options in this state?



# Presentations on Friday

Lightning Talks of five minutes

- Come prepared on Friday to discuss the following using about five slides for a five minute lightning talk.
- *Discuss*
- *The research question to address by the decision tree*
  - *Data, Decision nodes*
  - *The output from data splitting*
  - *Comparison of different orders of the decision nodes to check for purity in categories.*
  - *General performance of the tree to make decisions*
- **No submission, your presentation is the activity.**



So, did your team play the other team, in the end?