



Hyperiondev

# Workshop Session

**Mentor Name: Siviwe**

# Mentor – Welcome/Housekeeping

- ❑ The use of disrespectful language is prohibited during the session. This is a supportive, learning environment, please engage accordingly. (FBV: **Mutual Respect.**)
- ❑ No question is daft or silly - **ask away!**
- ❑ For all non-academic questions/support, please submit a query:  
[www.hyperiondev.com/support](http://www.hyperiondev.com/support)
- ❑ Report a safeguarding incident: [hyperiondev.com/safeguardreporting](http://hyperiondev.com/safeguardreporting)
- ❑ We would love your feedback on workshop session, please complete the form that is sent after the session.

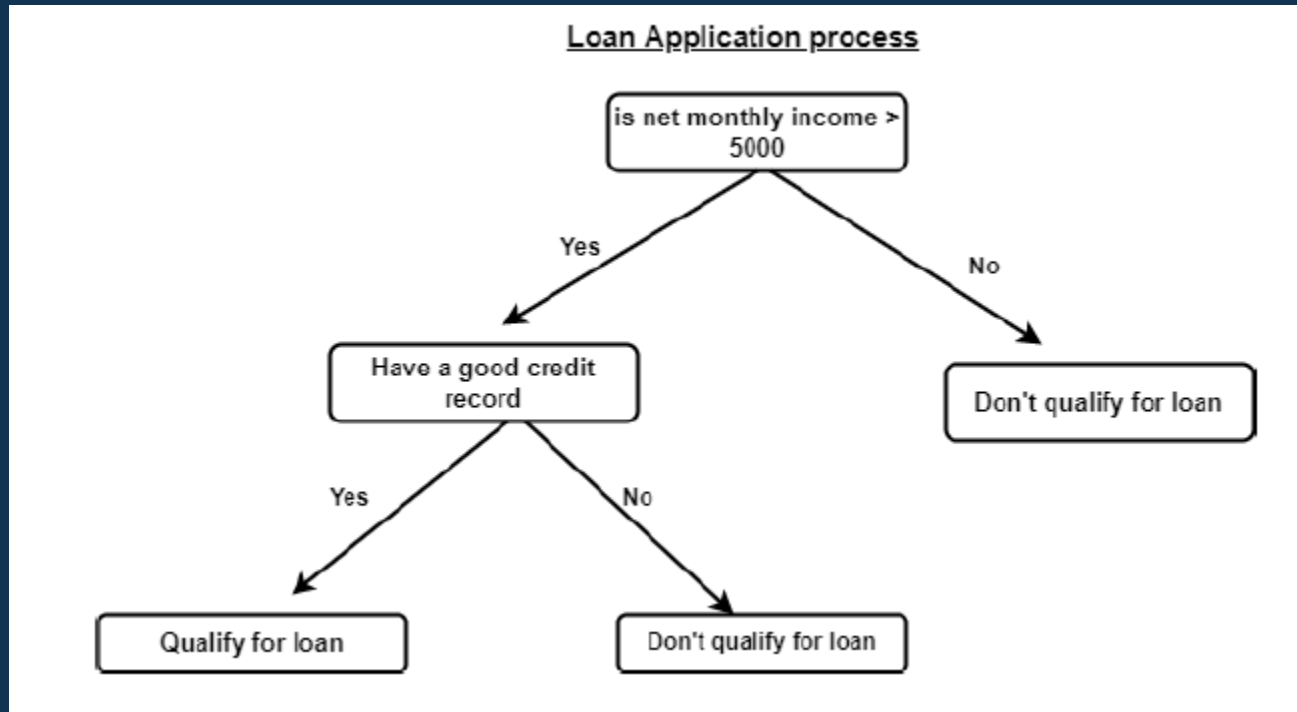
# Session Objectives

Today we will revise decision trees.

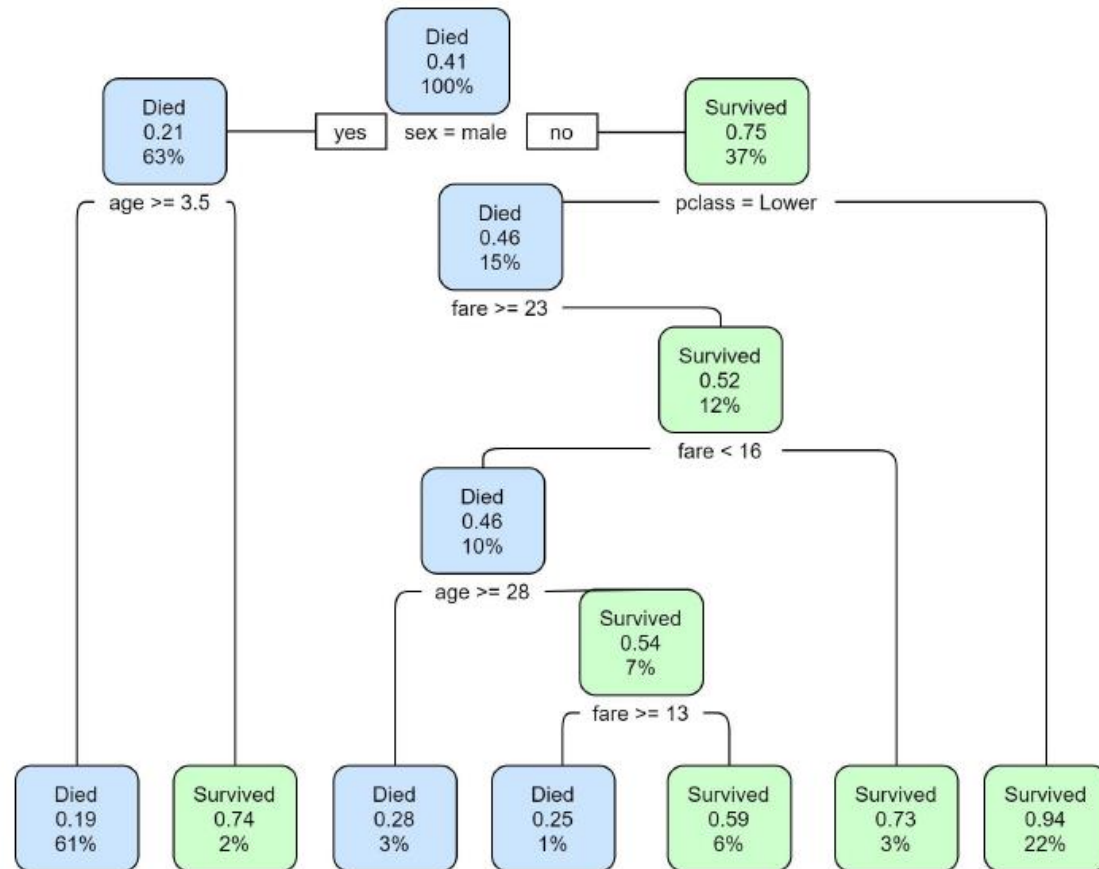
# What are decision trees?

Decision trees work by formulating simple rules that partition data into ever-smaller regions. Each partitioning is like a fork in the road, where a decision must be made. The decision is made based on rules which are derived from previous experiences.

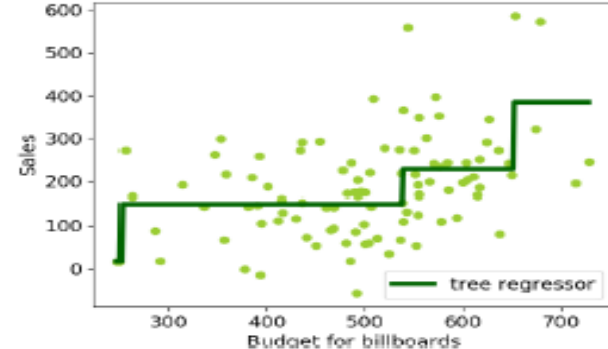
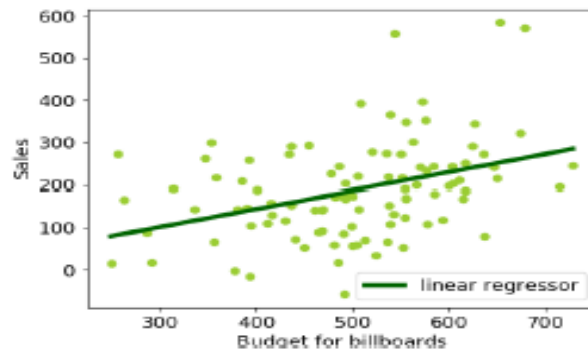
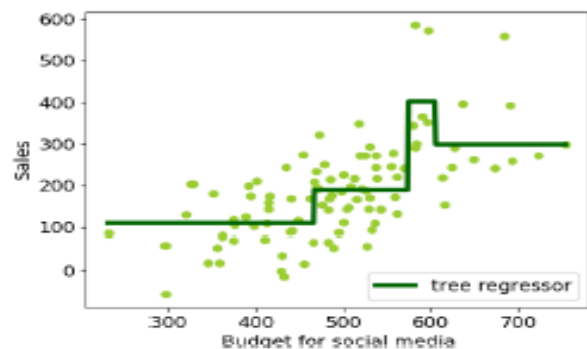
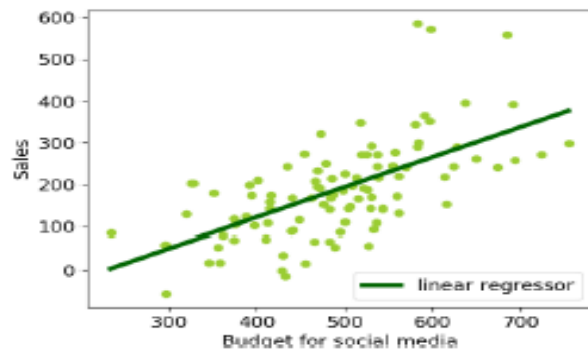
# Decision Making



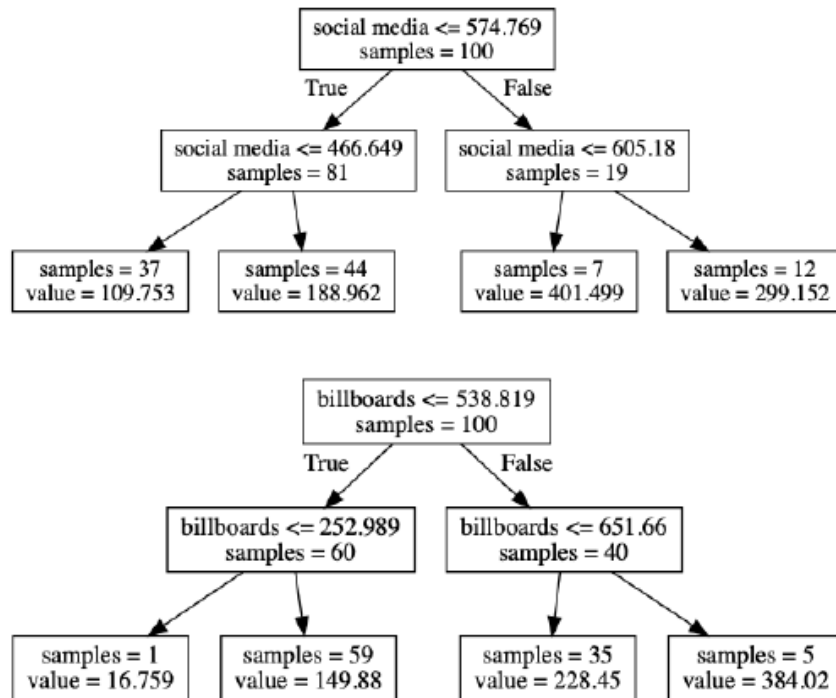
# Classification Trees



# Regression Trees



# Interpreting Decision Trees





# Overfitting \ Underfitting



# Fixing Overfitting and Underfitting

- Pruning
- Development set

# Ensemble Methods

Why the need for ensemble methods?

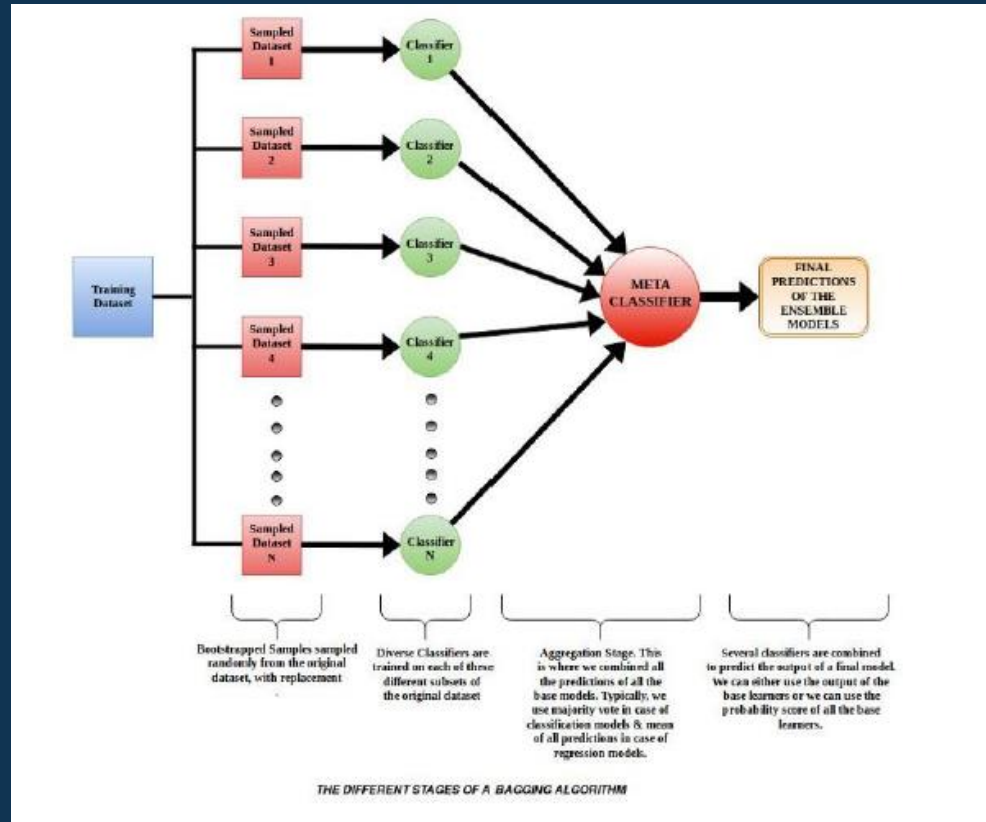
Types of ensemble methods:

- Reduce variance
- Improve accuracy
- Capture complex patterns

# Bootstrapping

```
def subsample(dataset, ratio=0.7):  
  
    sample = list()  
    n_sample = round(len(dataset) * ratio)  
  
    while len(sample) < n_sample:  
        index = randrange(len(dataset))  
        sample.append(dataset[index])  
  
    return sample
```

# Bagging Algorithm



# Random Forests

- Decorrelating tree classifiers
- Randomizing the splitting variable

# Boosting

- Boosting attempts to incorporate error(residuals) of earlier models into the data provided to later models.



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# Thank you for joining us

1. Take regular breaks
2. Stay hydrated
3. Avoid prolonged screen time
4. Practice good posture
5. Get regular exercise