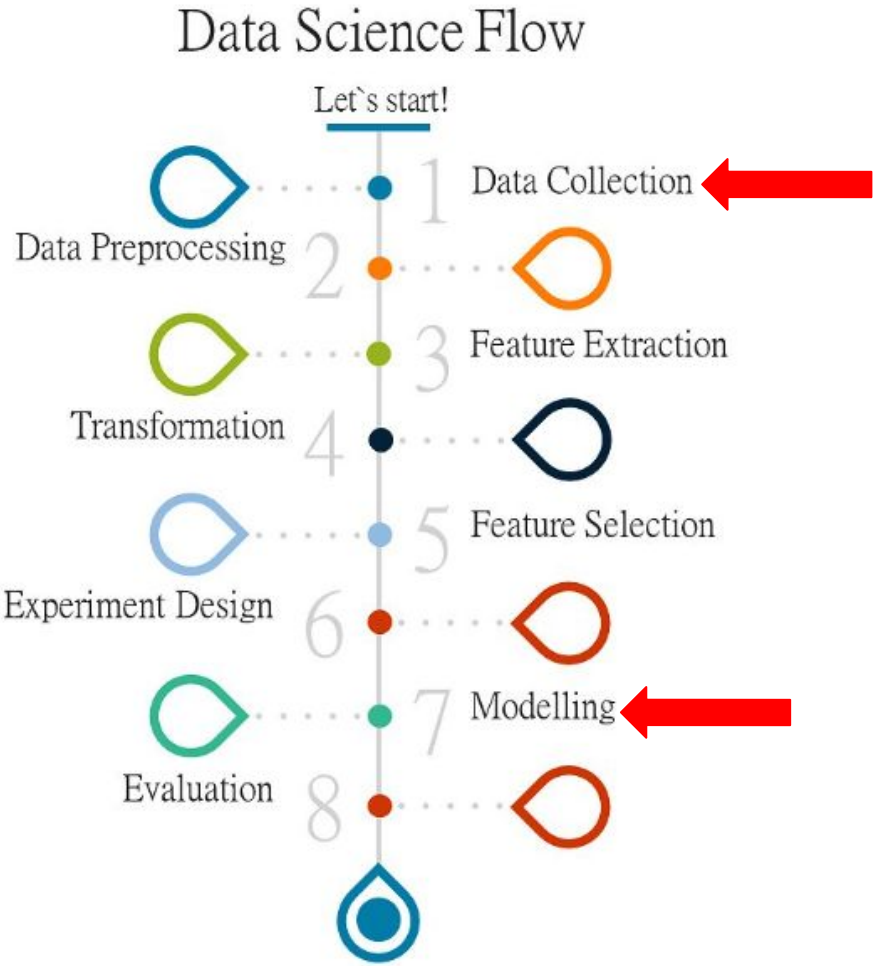
Applying Data Science to Predict Stock Prices

group 24


Data Science Flow
Let`s start!
1
Data Collection
Data Preprocessing
2
Feature Extraction
3
Transformation
4
Feature Selection
5
Experiment Design
6
Modelling
7
Evaluation
8

Problem definition

1. **Problem Statement:**

   Predicting stock prices accurately is crucial for investors and traders to make informed decisions. However, it's challenging due to the complex nature of financial markets and various influencing factors

2. **Objective:**

   Develop a model to predict stock prices based on historical data, aiding investors in making better trading decisions

What You Can Learn

1. **Data Preprocessing Techniques**
   - Learn about data cleaning, handling missing values for building predictive models
2. **Modeling and Hyperparameter Tuning**
   - Understand the process of selecting the right machine learning algorithm and fine-tuning its hyperparameters for optimal performance
3. **Evaluation Metrics**
   - Explore metrics like Mean Squared Error (MSE) for assessing model performance and understanding its accuracy

Implementation

1. **Data Collection**: Utilize Yahoo Finance API to fetch historical stock price data for analysis
2. **Data Analysis**: Visualize stock price movements and volume trends to understand patterns and correlations
3. **Model Building**: Split the data into training and testing sets, build a Random Forest Regressor model, and optimize its hyperparameters using GridSearchCV
4. **Model Evaluation**: Evaluate the model's performance using Mean Squared Error(MSE) and interpret the results
5. **Prediction**: Demonstrate how the trained model can predict stock prices for the next day based on the latest data

$$MSE = \sum_{i=1}^{n} (y_i - y_i^p)^2$$