Thanks for joining we will start at 4pm 🕓

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Today's Agenda

Understanding the Big Mart Sales Prediction Dataset

- Understanding the dataset and problem statement.
- Data Cleaning and formatting.
- Feature Encoding. (Ordinal/Nominal)
- Feature Scaling. (MinMax)
- Train Test Split.
- Modeling and predictions.
- Q/A Session.

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Google Developer Students Club
Institute of Business Administration

Data Science for Everyone

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WHO AM I?

- Technical Lead - GDSC IBA
- Google certified Data Analyst
- SAP Functional Analyst - 3STEM
- Deputy Team Lead - TCF ADP
- ML/DL Enthusiast
- Loves to bring useful insights out of Data.

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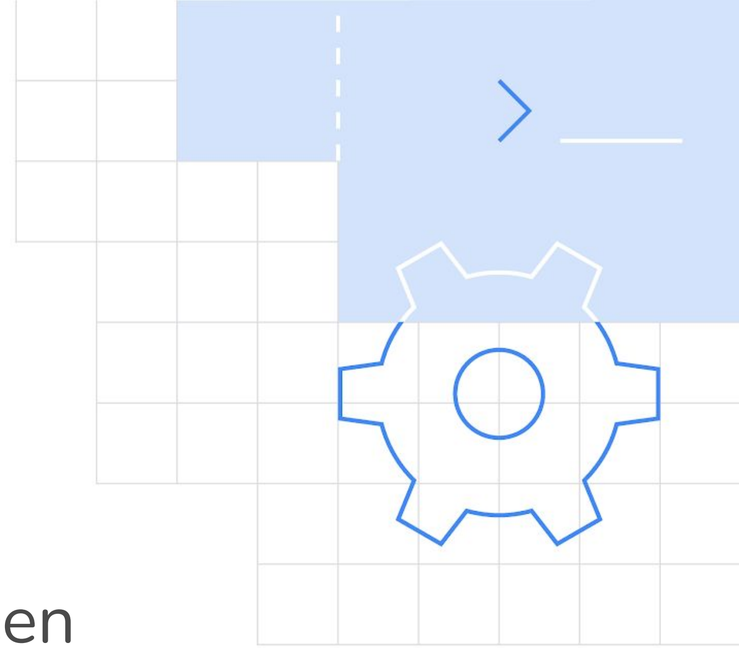
Big Mart Sales Prediction

2013 sales data for 1559 products across 10 stores in different cities

Challenge ?



-The data scientists at BigMart have collected **2013** sales data for **1559** products across **10 stores** in different cities.

-Also, certain attributes of each product and store have been defined.

-The aim is to build a **Predictive Model** and predict the sales of each product at a particular outlet.

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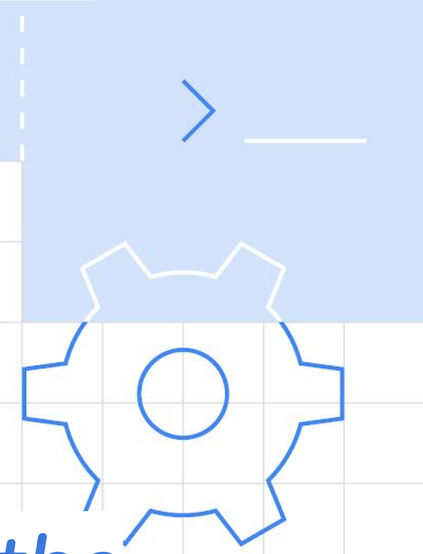

In this challenge, we ask you to build a predictive model that answers the question: "What would be the sale of each product at a particular outlet given its properties?"

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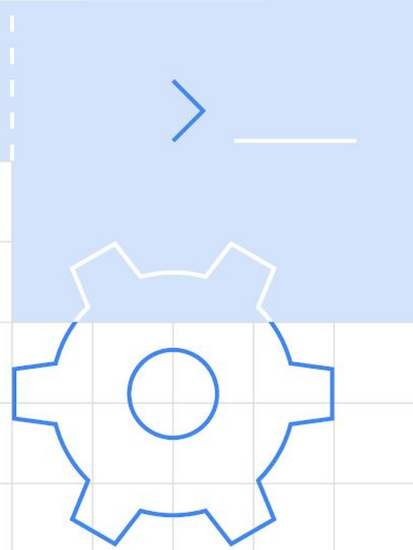
Understanding of Data



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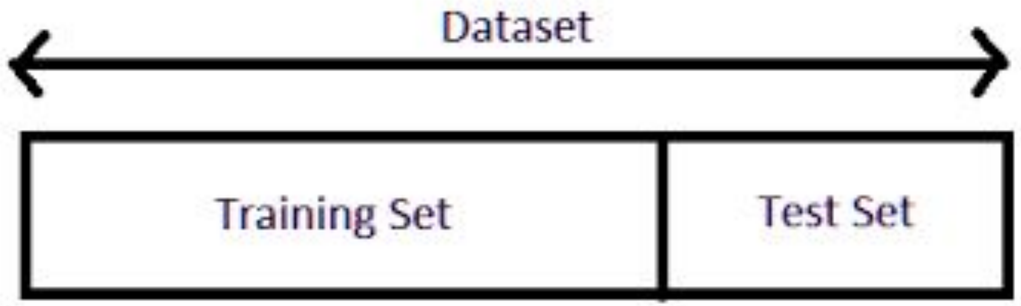
Features:

Variable	Description
Item_Identifier	Unique product ID
Item_Weight	Weight of product
Item_Fat_Content	Whether the product is low fat or not
Item_Visibility	The % of total display area of all products in a store allocated to the particular product
Item_Type	The category to which the product belongs
Item_MRP	Maximum Retail Price (list price) of the product
Outlet_Identifier	Unique store ID
Outlet_Establishment_Year	The year in which store was established
Outlet_Size	The size of the store in terms of ground area covered
Outlet_Location_Type	The type of city in which the store is located
Outlet_Type	Whether the outlet is just a grocery store or some sort of supermarket
Item_Outlet_Sales	Sales of the product in the particular store. This is the outcome variable to be predicted.

What is Train/Test data

- Train/Test is a method to measure the accuracy of your model.
- It is called **Train/Test split** because you split the the data set into two sets: a training set and a testing set.
- You ***train*** the model using the training set.
- You ***test*** the model using the testing set.
- ***Train*** the model means *create* the model.
- ***Test*** the model means test the accuracy of the model.



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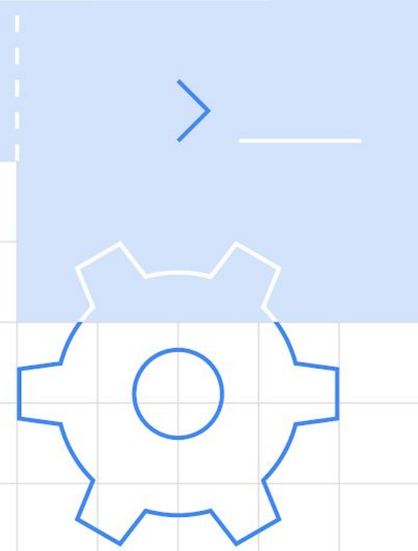
Machine Learning Techniques



1) **Feature Selection**: is the method of reducing the input variable to your model by using only relevant data and getting rid of noise in data.
2) **Feature Encoding**: Machine learning models can only work with numerical values. For this reason, it is necessary to transform the categorical values of the relevant features into numerical ones.
3) **Feature Scaling**: Feature Scaling is a technique to standardize the independent features present in the data in a fixed range.

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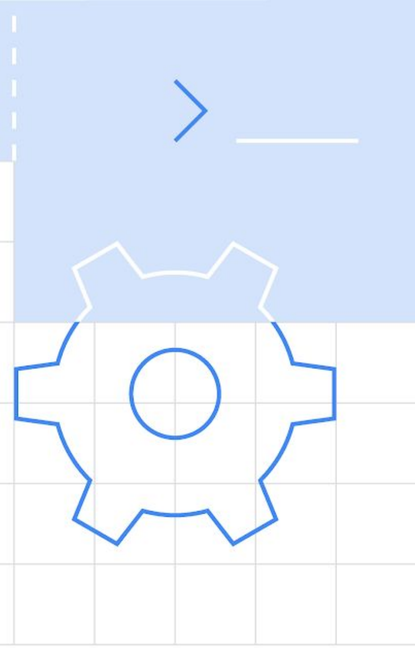
Feature Selection



- When building a machine learning model in real-life, it’s almost rare that all the variables in the dataset are **useful** to build a model. Adding redundant variables **reduces** the generalization capability of the model and may also reduce the overall **accuracy** of a classifier.
- The goal of feature selection in machine learning is to find the **best set of features** that allows one to build useful models of studied phenomena.

  A. Filter methods (Chi-Square Test, Fisher’s Test, Pearson’ Correlation..)

  B. Wrapper methods

  C. Embedded methods

  D. Hybrid methods

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Feature Encoding

- **Ordinal Data:** The categories have an inherent order
- **Nominal Data:** The categories do not have an inherent order

	Degree
0	High school
1	Masters
2	Diploma
3	Bachelors
4	Bachelors
5	Masters
6	Phd
7	High school
8	High school

	Degree
0	1
1	4
2	2
3	3
4	3
5	4
6	5
7	1
8	1

Index	Animal
0	Dog
1	Cat
2	Sheep
3	Horse
4	Lion

One-Hot code

Index	Dog	Cat	Sheep	Lion	Horse
0	1	0	0	0	0
1	0	1	0	0	0
2	0	0	1	0	0
3	0	0	0	0	1
4	0	0	0	1	0

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Feature Scaling

I’m sure most of you must have faced this issue in your projects or your learning journey. For example, one feature is entirely in **kilograms** while the other is in **grams**, another one is **liters**, and so on. How can we use these features when they vary so vastly in terms of what they’re presenting?

	Student	CGPA	Salary '000
0	1	3.0	60
1	2	3.0	40
2	3	4.0	40
3	4	4.5	50
4	5	4.2	52

	Student	CGPA	Salary '000
0	1	-1.184341	1.520013
1	2	-1.184341	-1.100699
2	3	0.416120	-1.100699
3	4	1.216350	0.209657
4	5	0.736212	0.471728

Cont.

- **Normalization**: is a scaling technique in which values are shifted and rescaled so that they end up ranging between **0** and **1.** It is also known as **Min-Max** scaling.

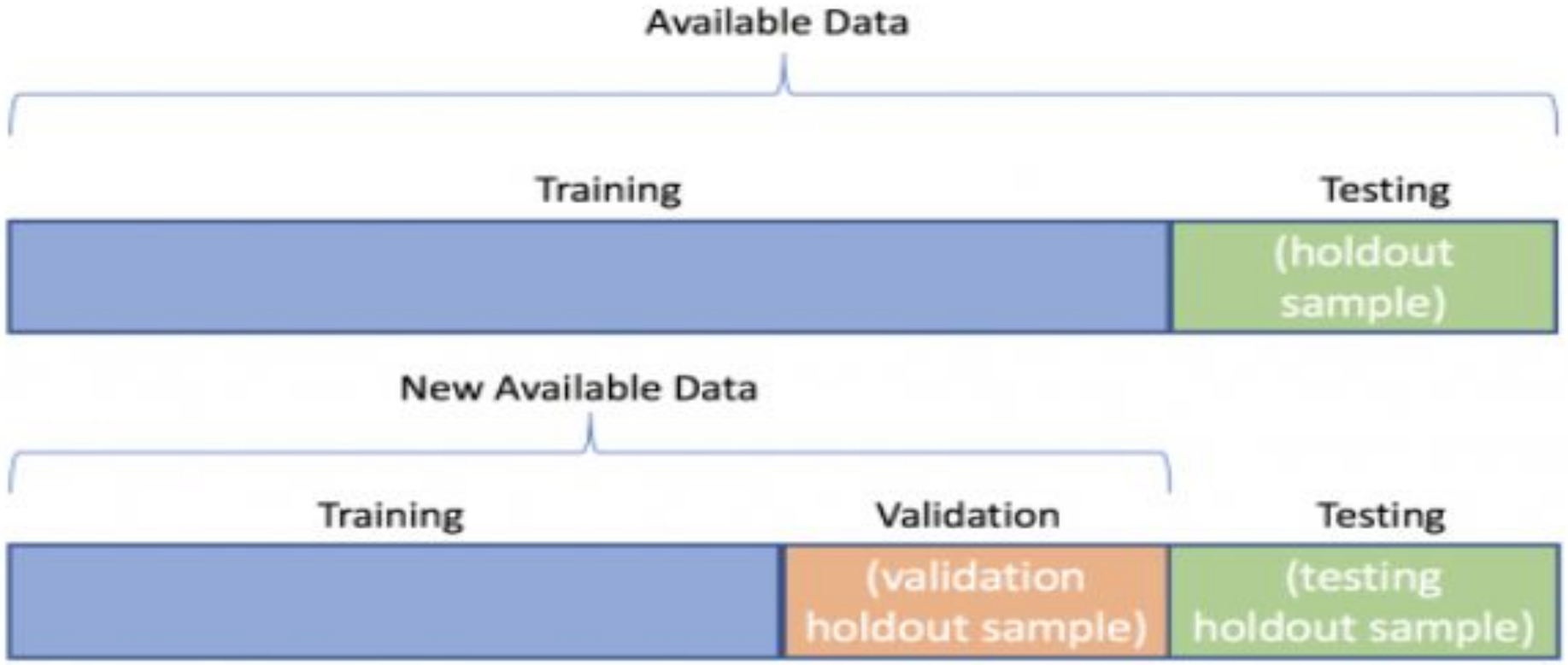
$$X' = \frac{X - X_{min}}{X_{max} - X_{min}}$$

- **Standardization:** is another scaling technique where the values are centered around the mean with a unit standard deviation.

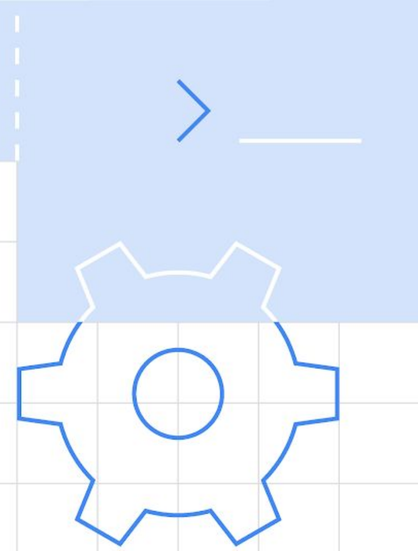
$$X' = \frac{X - \mu}{\sigma}$$

How Kaggle Works?

- We have given Train and Test data.



Supervised Learning Algorithms



- Linear Regression
- Logistic Regression
- K Nearest Neighbor - KNN
- Decision Trees
- Random Forest
- Naive Bayes’
- Support Vector Machine - SVM

and many more...

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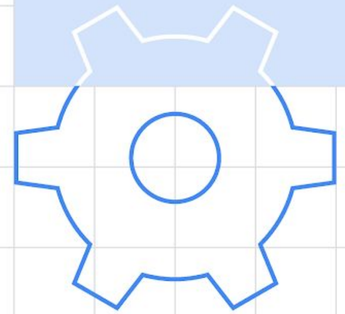
Life Cycle of Data Science Project



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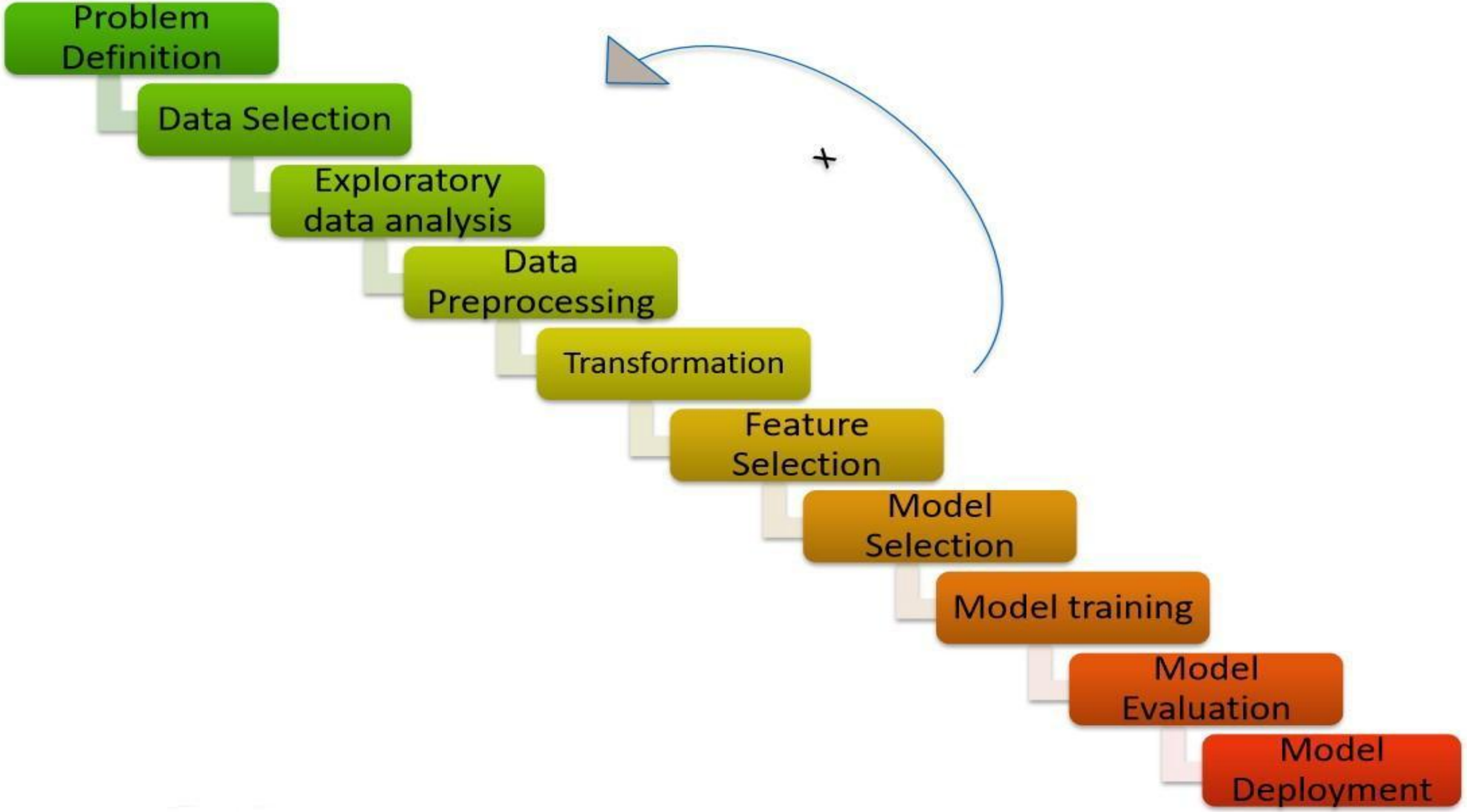
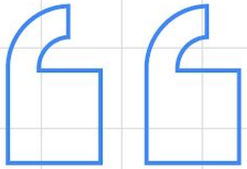

Problem Definition
Data Selection
Exploratory data analysis
Data Preprocessing
Transformation
Feature Selection
Model Selection
Model training
Model Evaluation
Model Deployment



Are you all ready Now to kick-start your journey as **Data Scientists**?

Let's get started!

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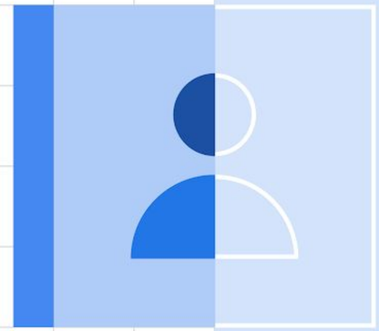
Thank you so much!!!

Hope you all are pumped up and excited for upcoming DSC Sessions!



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Q/A Session