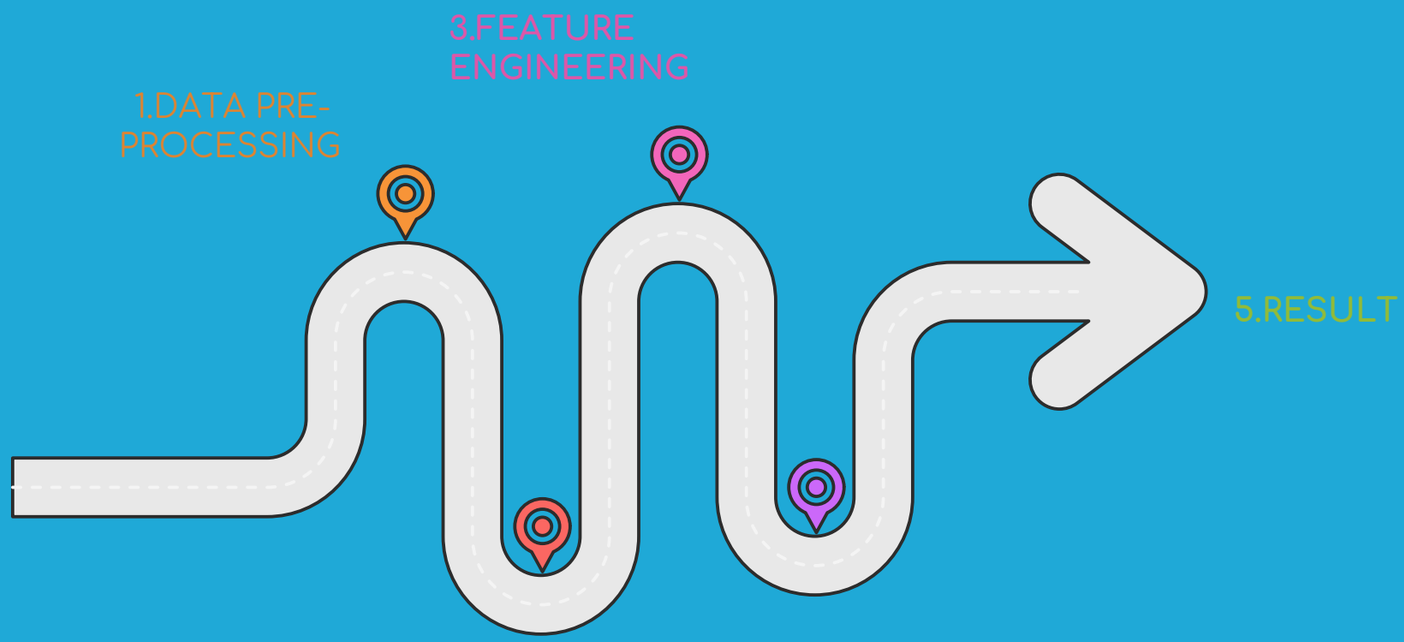
DEEP LEARNING PROJECT ON PRODUCT REORDER PREDICTION

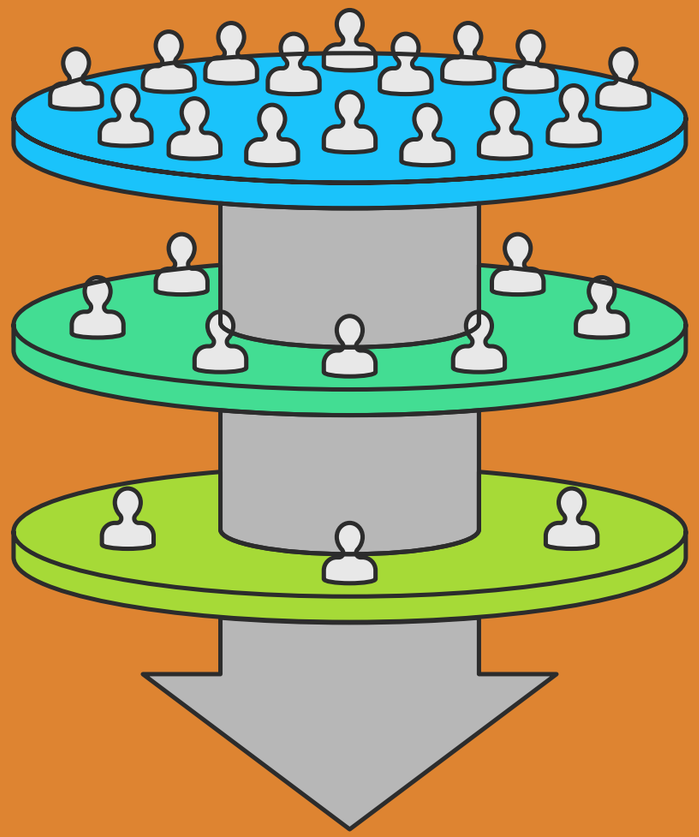
PROBLEM STATEMENT

The project involves building a Deep Learning model to predict product reordering behaviour by users. The aim is to identify patterns in purchasing habits and predict whether a product will be reordered in the next purchase cycle. The project includes data pre-processing, exploratory data analysis, feature engineering, Model building and Model deployment using Streamlit application.

DATA SCIENCE WORK FLOW



DATA PRE-PROCESSING

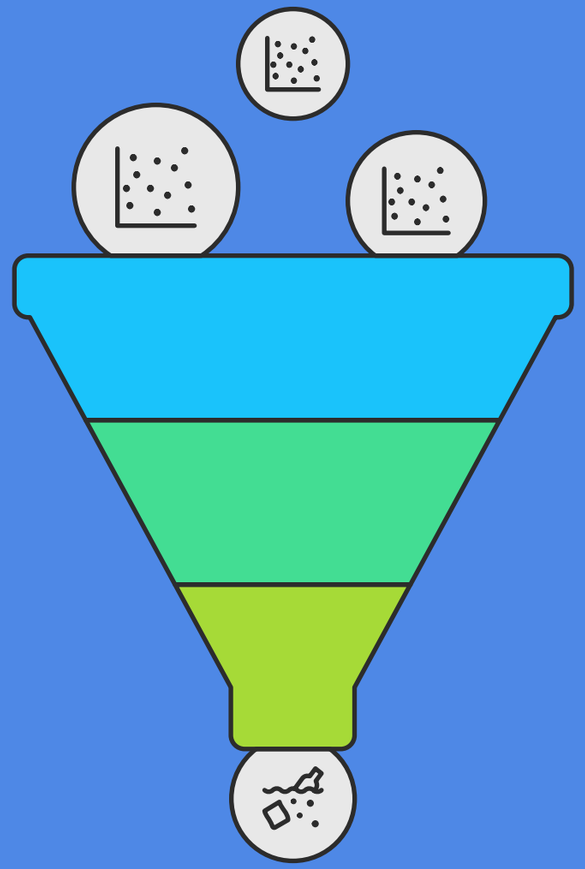


DATA CLEANING

DATA TRANSFORMATION

DATA REDUCTION

DATA CLEANING PROCESS



Identify Missing Values

Locate gaps in data

Remove Duplicates

Eliminate redundant entries

Correct Inaccuracies

Fix errors and inconsistencies

How to handle duplicate data in machine learning?

VS

Remove Duplicates

Ensures unique data points for accuracy

Keep Duplicates

May skew model results and predictions

Data Preprocessing and Feature Engineering Sequence

OUTLIER CHECKING

Z Score Method

Z-score detects outliers using mean and standard deviation, best for normally distributed data.

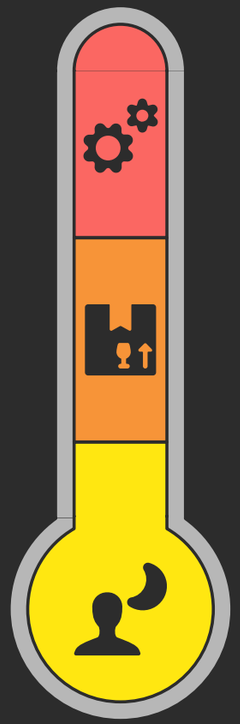
IQR Method

IQR method uses the interquartile range and is more robust for skewed or non-normal distributions.

Cycle of Exploratory Data Analysis

FEATURE ENGINEERING

Combined



Individual

User-product

Focuses on specific user-product relationship.(how many times user reordered the product)

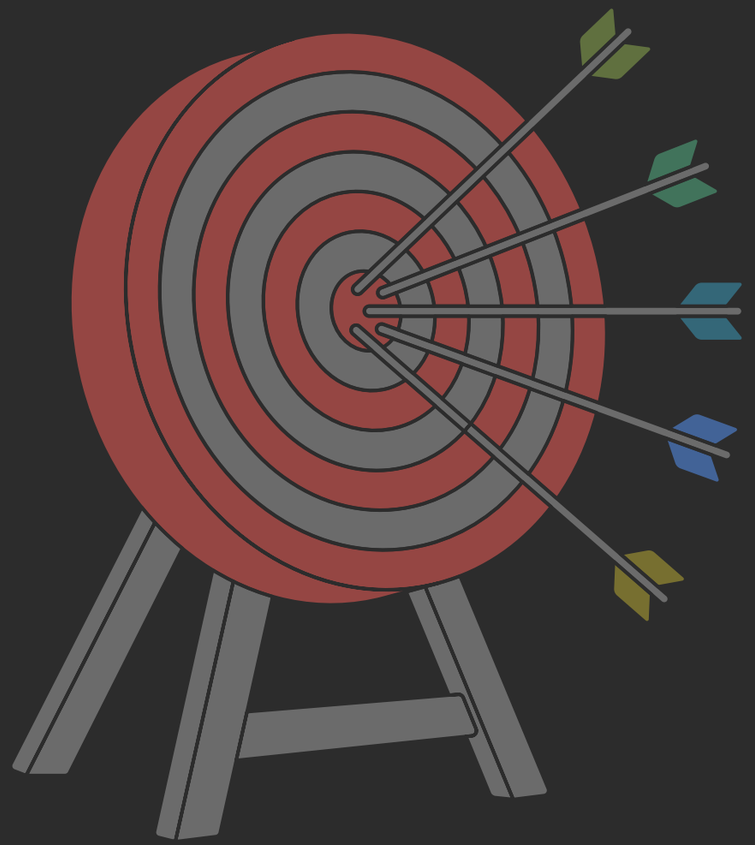
Product-based

Focuses on inherent product characteristics. (reorder ratio, number of times reordered)

User-based

Focuses on individual purchasing behavior (average days between orders, total orders)

NEURAL NETWORK ARCHITECTURE



EVALUATION METRICS- F1 Score, Accuracy, Precision, Recall

Assess model performance

OPTIMIZER-Adam

Adjust model parameters

LOSS FUNCTION - Categorical Cross-Entropy

Measure prediction error

OUTPUT LAYER - Softmax

Generate final predictions

INNER LAYERS - Relu

Process input data

PRODUCT REORDER PREDICTION

Reordered

Indicates the item was reordered

VS

Not Reordered

Indicates the item was not reordered