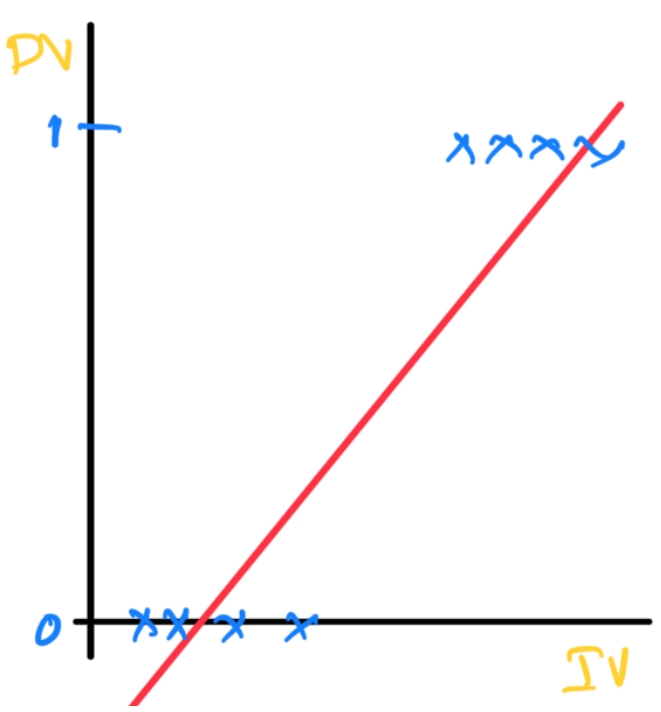
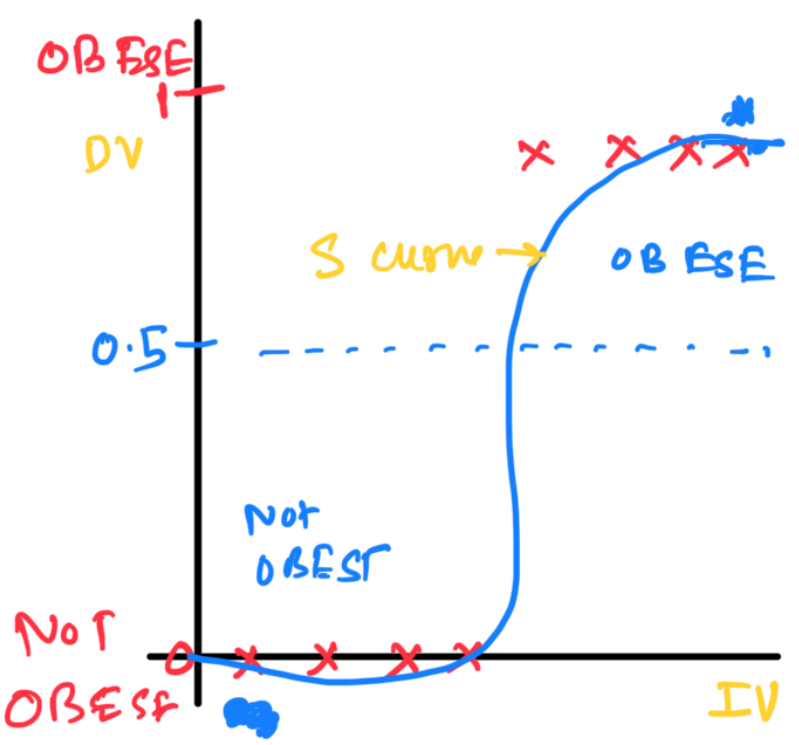
Logistic Regression

1. Supervised Learning Algo.
   (Labels are available)
2. Categorical Output
   - 0/1
   - Yes/No
   - Pass/Fail
   - Purchase / Not Purchase
3. Different from Linear Regression
   - SLR predicts continuous values
   - LR predicts probabilities & perform classification
4. Logistic function — Sigmoid function
   - — S-shaped curve used to map predicted values as probabilities bet^n 0 & 1
5. Threshold — A threshold value is used to classify predictions into discrete classes (0 or 1) based on the predicted probabilities

Supervised (Labels)
- Regression
  - SLR
  - MLR
  - PLR
    - Ridge
    - Lasso
    - ElasticNet
- Classification
  - Binary Logistic
  - Multi
    - Multinomial
    - Multi Ordinal
  - KNN
  - Naive Bayes
  - DT
  - RF
  - SVM





Linear Regression

Logistic Regression

$$f(x) = \frac{1}{1+e^{-z}}$$

Advantages -

- Provides probabilities for outcome
- Effective for binary and multi class classification
- Simple and interpretable model

Limitations

- Sensitive to outliers
- May not work for non-linear relationship
- Assume linearity between DV & IV