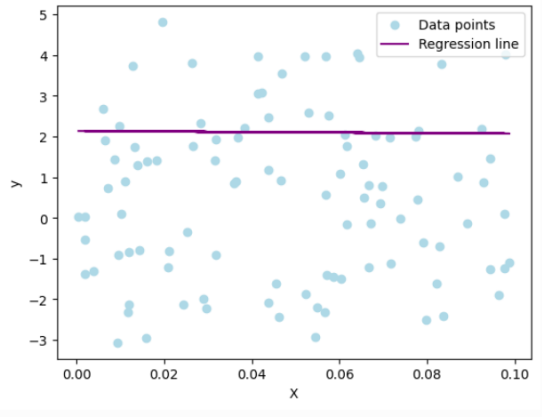
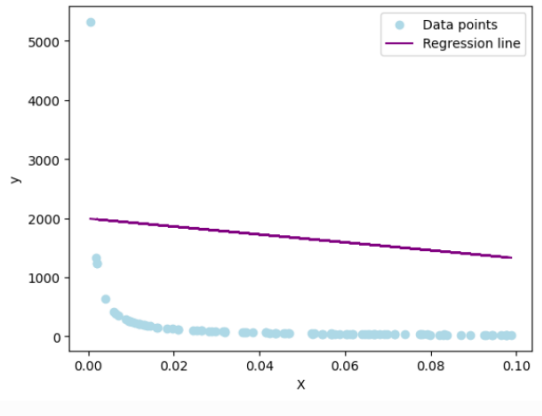
Name : Tahseen Nazar

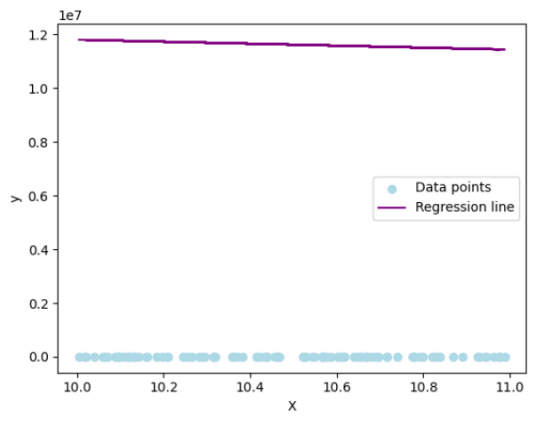
■ Linear Regression in Machine Learning

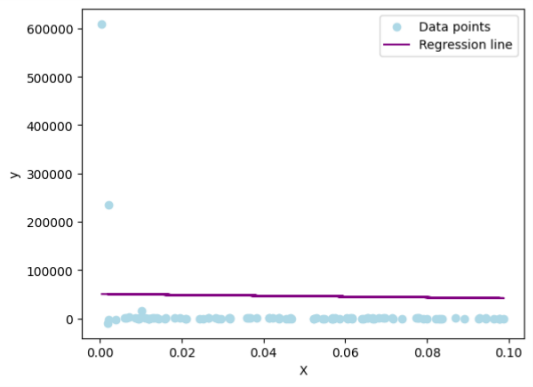
Linear Regression is a fundamental supervised learning algorithm used in Machine Learning for predicting a continuous output variable based on one or more input variables (features). It models the relationship between the input variables (X) and the target variable (Y) by fitting a linear equation to the data. Linear regression remains a cornerstone of machine learning and statistics, particularly useful for exploratory data analysis and as a foundational algorithm to understand more complex methods.

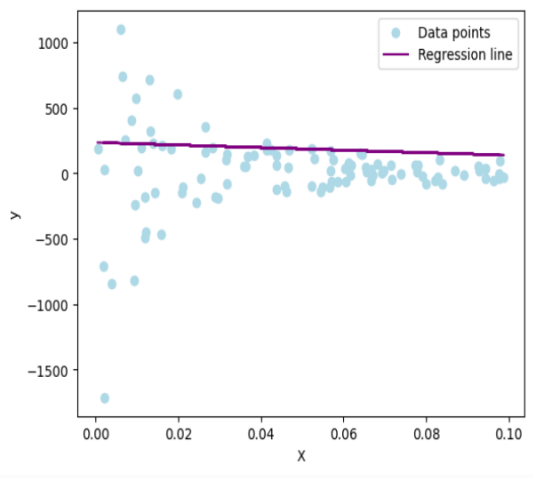
- 6 Output changes in linear regression. Are given below.

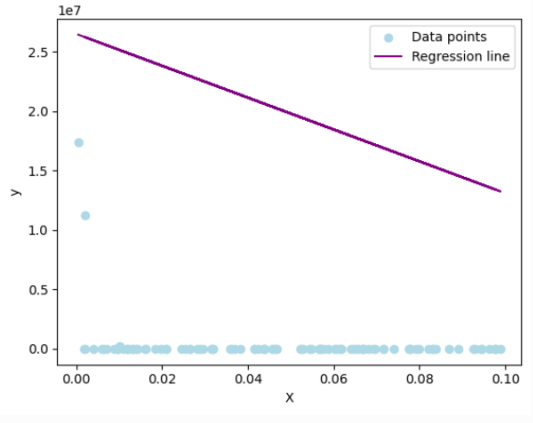












■ Logistic Regression in Machine Learning

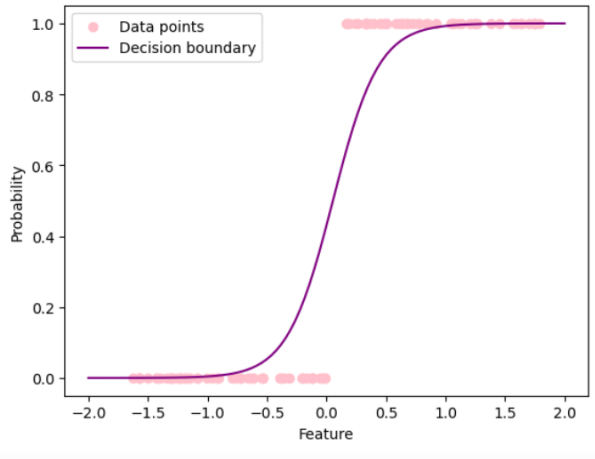
Logistic Regression is a widely used statistical method in machine learning, primarily applied to binary classification problems. Despite its name, logistic regression is a classification algorithm rather than a

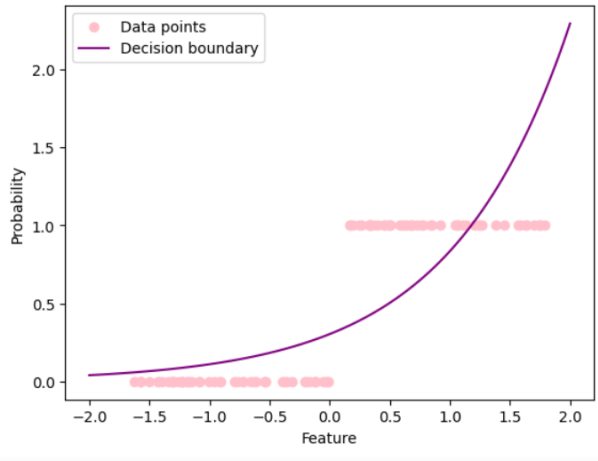
regression one. It predicts the probability of a binary outcome (e.g., yes/no, true/false, 0/1) based on one or more input features. ● Sigmoid Function: Logistic regression uses the sigmoid (logistic) function to map the linear combination of input features to a value between 0 and 1. ● Probability Prediction: The sigmoid function output represents the probability of the input belonging to a certain class. For example: If , classify the input as class 1. Otherwise, classify it as class 0.

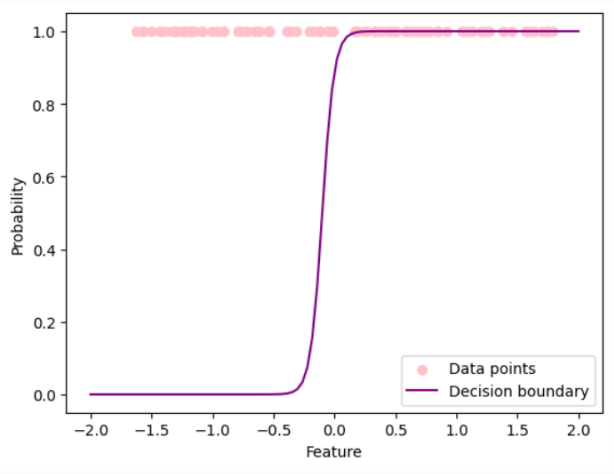
■ Conclusion

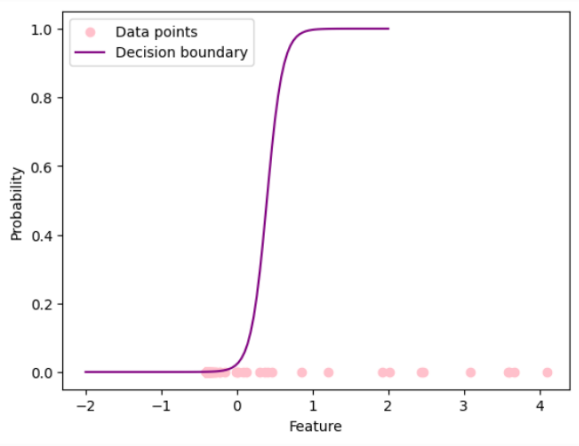
Logistic regression is a foundational algorithm in machine learning and statistics, offering simplicity and interpretability. While it may not perform as well as advanced algorithms on complex datasets, it remains a popular choice for binary classification problems due to its efficiency and ease of use.

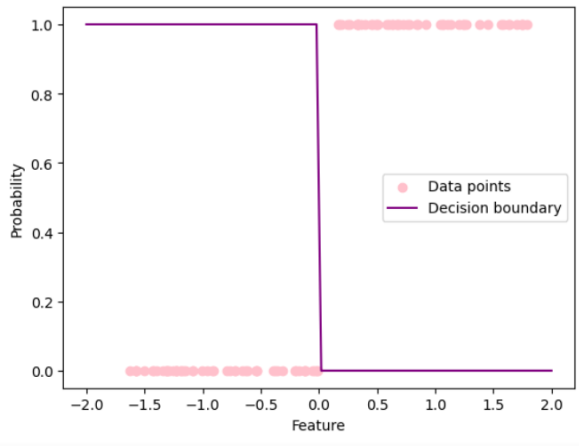
6 Output changes in logistic regression. Are given below.

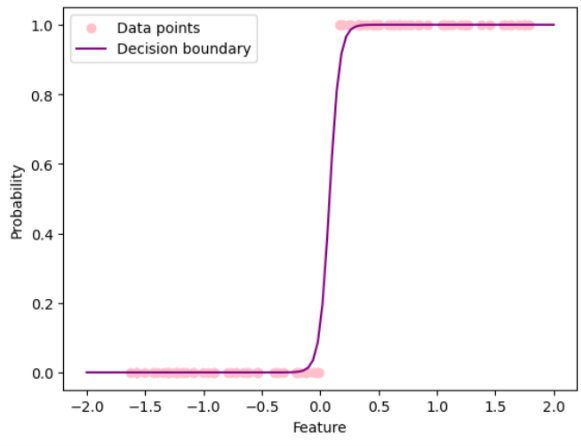





Probability
Feature
Data points
Decision boundary


Probability
Feature
Data points
Decision boundary


Probability
Feature
Data points
Decision boundary


Probability
Feature
Data points
Decision boundary