



SNS COLLEGE OF TECHNOLOGY



AN AUTONOMOUS INSTITUTION

**Approved by AICTE New Delhi & Affiliated to Anna University Chennai
Accredited by NBA & Accredited by NAAC with “A+” Grade, Recognized by UGC
COIMBATORE**

DEPARTMENT OF CIVIL ENGINEERING

MACHINE LEARNING FOR CIVIL ENGINEERS

II YEAR / IV SEMESTER

Unit 2 : Supervised Learning

Topic 2: Linear Regression



INTRODUCTION TO LINEAR REGRESSION



1. Linear Regression is a statistical method used to establish a relationship between a dependent variable and one or more independent variables.
2. The purpose of Linear Regression is to predict the value of the dependent variable based on the values of the independent variables.
3. In Civil Engineering, Linear Regression can be used to model the relationship between various parameters like load, stress, strain, etc.



STEPS IN LINEAR REGRESSION

1. Data Collection: Collect data for the dependent variable and independent variable(s).
2. Data Preparation: Preprocess the data by cleaning, transforming, and normalizing it.
3. Model Building: Build a Linear Regression model using the preprocessed data.



4. Model Evaluation: Evaluate the performance of the model using various metrics like Mean Squared Error, Root Mean Squared Error, R-squared, etc.

5. Model Optimization: Optimize the model by fine-tuning the hyperparameters.



APPLICATION OF LINEAR REGRESSION IN CIVIL ENGINEERING



1. Prediction of compressive strength of concrete based on mix design parameters.
2. Estimation of soil properties like shear strength, compressibility, etc. based on soil index properties.
3. Prediction of settlement of foundation based on load and soil properties.



4. Modeling the relationship between pavement performance and various factors like traffic volume, climate, etc.
5. Predicting the bending moment of reinforced concrete beams based on various parameters like span length, load, reinforcement, etc.



Thank You!!