

# Final Project Report

**Industrial Winter Internship 2025**

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**Internship Domain:** Data Science / Machine Learning

**Project Title:** Student Performance Prediction Using Machine Learning

**Internship Platform:** Upskill Campus

**Duration:** Winter Internship 2025

## 1. Introduction

The goal of this project is to predict student academic performance using machine learning techniques. Educational institutions can use such systems to identify students who may need additional support and improve overall academic outcomes.

This project applies supervised machine learning algorithms to analyze student-related data and predict performance outcomes.

## 2. Problem Statement

Many students face academic difficulties that go unnoticed until final results. This project aims to build a machine learning model that predicts student performance based on academic and personal attributes.

## 3. Objectives

To understand real-world data preprocessing

To apply machine learning algorithms

To evaluate model performance

To gain hands-on experience in end-to-end ML workflow

#### **4. Tools and Technologies Used**

Python

Pandas

NumPy

Matplotlib

Scikit-learn

Jupyter Notebook

GitHub

#### **5. Dataset Description**

The dataset contains student-related attributes such as:

Study time

Attendance

Previous grades

Internal assessment scores

The dataset was cleaned and preprocessed before model training.

#### **6. Methodology**

1. Data Collection

2. Data Cleaning and Preprocessing

3. Feature Selection

4. Data Splitting (Train/Test)

5. Model Training

6. Model Evaluation

## 7. Machine Learning Algorithms Used

Linear Regression

Logistic Regression

Decision Tree Classifier

## 8. Model Evaluation

Evaluation metrics used:

Accuracy

Precision

Recall

F1-Score

The Decision Tree model provided the best performance among the tested algorithms.

## 9. Results and Discussion

The trained model successfully predicted student performance with acceptable accuracy. Visualization techniques were used to understand feature importance and model behavior.

## 10. Challenges Faced

Understanding feature selection

Choosing the right algorithm

Preventing overfitting

These challenges were overcome through experimentation and parameter tuning.

## 11. Conclusion

This project helped me gain practical experience in data science and machine learning. I learned

how to build, evaluate, and improve ML models. The project enhanced my analytical and coding skills significantly.

## 12. Future Scope

Use larger datasets

Apply advanced models

Deploy as a web application