

Project 1

Machine Learning Project 1 (Beginner to Intermediate Level)

Project Title:

"Customer Purchase Prediction Using Classification Algorithms"

Objective:

To build a basic classification model that predicts whether a customer will purchase a product or service based on their demographic and behavioral data.

Dataset Example:

- Online Customer Dataset
- Contains features like:
 - Age
 - Gender
 - Annual Income
 - Spending Score
 - Previous purchase behavior
 - Engagement metrics

You may also provide any similar dataset.

Project Tasks / Workflow:

1. Data Loading & Understanding:

- Load the dataset using pandas.
- Display first few rows, dataset shape, and column details.
- Identify the target variable (Purchase / Not Purchase).

2. Data Preprocessing:

- Handle missing values (imputation or removal).
- Encode categorical variables (Label Encoding / One-Hot Encoding).
- Scale numerical features using StandardScaler or MinMaxScaler.
- Split data into training and testing sets.

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3. Exploratory Data Analysis (EDA):

- Plot distributions of key features.
- Visualize correlations using heatmaps.
- Identify customer behavior patterns (e.g., higher income correlates with purchases).

4. Model Building:

Implement at least 2 classification algorithms:

- Logistic Regression
- Decision Tree
- Random Forest
- K-Nearest Neighbors (KNN)

Train each model and generate predictions.

5. Model Evaluation:

Compare models using:

- Accuracy
- Precision
- Recall
- F1-Score
- Confusion Matrix

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Select the best-performing model.

6. Final Deliverables:

- Clean and documented notebook
 - Visualizations
 - Final model comparison summary
 - Explanation of project insights
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Learning Outcome:

By completing this project, the intern will:

- Understand how classification models work
- Learn how to preprocess and analyze real data
- Generate and interpret evaluation metrics
- Build confidence in ML model implementation



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