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1. MAE (Mean Absolute Error) Calculation

Question:
Given the actual house prices `[200000, 250000, 300000, 400000]` and predicted prices `[210000, 245000, 290000, 390000]`, write a Python function to compute the **MAE**.

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2. RMSE (Root Mean Squared Error) Calculation

Question:
For actual exam scores `[90, 85, 70, 60, 75]` and predicted scores `[88, 82, 65, 67, 78]`, compute the **RMSE** using Python.

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3. R^2 Score (Coefficient of Determination)

Question:
You are given:

- Actual car mileage: `[10, 12, 14, 16, 18]`
- Predicted mileage: `[11, 13, 13, 15, 19]`
  Write code to compute the **R^2 score**.

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4. Regression Using Decision Tree

Question:
Create a synthetic dataset with `X = [[1], [2], [3], [4], [5]]` and `y = [10, 20, 30, 40, 50]`.
Train a **Decision Tree Regressor** and predict the output for `X = [[3.5]]`.

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5. Classification Using Decision Tree

Question:
Given data:

```
python
CopyEdit
X = [[1, 1], [1, 0], [0, 1], [0, 0]]
y = [1, 1, 0, 0]
```

Train a **Decision Tree Classifier** to classify AND logic gate behavior.

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6. Evaluate a Regression Tree with MAE, RMSE, R^2

Question:
Generate regression data using `make_regression(n_samples=50, n_features=1, noise=10)`
Train a **Decision Tree Regressor**, make predictions, and evaluate the model using **MAE**, **RMSE**, and **R^2 Score**.

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7. Evaluate a Classification Tree using Classification Report

Question:
Generate a binary classification dataset with `make_classification(n_samples=100, n_features=2, n_classes=2)`
Train a **Decision Tree Classifier** and output the **classification report** and **F1-score**.

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8. CART (Classification and Regression Tree) for Classification

Question:
Using the Iris dataset (`from sklearn.datasets import load_iris`), implement a **CART classifier**.
Split the data, train the model, and print the accuracy, precision, and F1-score.

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9. CART for Regression with Visualization

Question:
Use `make_regression` to create data.
Train a **DecisionTreeRegressor**, and **plot** the predicted vs actual values to visually assess the regression tree.

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10. Decision Boundary Visualization for Classification Tree

Question:
Create a classification dataset using `make_classification(n_samples=200, n_features=2)`.
Train a **Decision Tree Classifier** and plot the **decision boundary** using `matplotlib`.