Task: "Build & Judge a Mini AI"

Part 1 — Chronology of AI

Write one real-world example for each stage:
Machine Learning → Credit Card Fraud Detection
Deep Learning → Self-Driving Cars
Computer Vision → Face Unlock on Smartphones
NLP → Customer Support Chatbots
LLMs → ChatGPT

Part 2 — Deep Learning Architectures

Match the model to the use case:
1. RNN —> Early speech-to-text systems
2. LSTM —> Text translation (old Google Translate)
3. CNN —>Image recognition
4. Transformer —> Predicting the next word in ChatGPT

Part 3 — Frameworks

Choose one framework (PyTorch / TensorFlow / Keras).
In one sentence, explain why you would use it if you were a student making a
cat-vs-dog classifier.
  - I would choose Keras because it's beginner-friendly, has a simple and intuitive API, and
    lets you build a cat-vs-dog image classifier with just a few lines of code while still
    leveraging powerful TensorFlow tools under the hood.

Part 4 — Evaluation Metrics

Imagine you built a spam filter. Answer:
Precision: If it marks 10 emails as spam and 7 are truly spam → what's
Precision?
  - If it marks 10 emails as spam and 7 are truly spam:
    Precision = True Positives / (True Positives + False Positives) = 0.70

Recall: If there were 12 spam emails in total, how many did it catch?
(use same example)
  - If there were 12 spam emails in total and the system correctly caught 7:
    Recall = True Positives / (True Positives + False Negatives)= 0.58

F1 Score: Use the formula and calculate (round to 2 decimals).
  - F1 = 2 × (Precision × Recall) / (Precision + Recall)=0.63

MSE/MAE: Predict your friend's age (actual = 15, prediction = 18). Which
metric punishes the error more?
- MSE (Mean Squared Error) = 9 and MAE (Mean Absolute Error) = 3
  MSE punishes the error more because it squares the difference, making larger errors
  hurt more.

BLEU/ROUGE: AI translated "The cat sat on the mat" as "Cat is on the
mat." Which metric (BLEU/ROUGE) do you think would give a high score?
- BLEU focuses on n-gram overlap and precision — how much of the output matches the
  reference and ROUGE emphasizes recall.
  BLEU would likely give a high score because the key words ("cat", "on", "the", "mat") are
  present and in the correct order, even if "sat" is changed to "is".

Part 5 — Responsible AI & Explainability

You built an AI that predicts loan approvals.
A customer asks, "Why was my loan rejected?"
Write one simple way to explain the decision fairly (e.g., "Your income was too
low compared to the loan size").
- I would give the following explanation: "Your loan was rejected because your income
  was not sufficient compared to the amount you requested. Our AI system looks at factors
  like your income, credit history, and current debts to make sure loans are given
  responsibly. In this case, the system found that approving the loan might be risky based
  on those factors. If your financial situation changes, you're welcome to apply again."