Task: “Build & Judge a Mini AI”

### Part 1 — Chronology of AI

Write one real-world example for each stage:

Machine Learning → Powering recommendation engines for Netflix

Deep Learning → Tesla’s autopilot uses deep neural networks to detect lanes and objects.

Computer Vision → Facebook auto-tags friends in photos using facial recognition.

NLP → Gmail suggests quick replies using language understanding.

LLMs → ChatGPT generates human-like responses across topics.

### Part 2 — Deep Learning Architectures

Match the model to the use case:

RNN → Early speech-to-text systems

LSTM → Text translation (old Google Translate)

CNN → Image recognition  
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.

Answer:

PyTorch, I'd use PyTorch because it's beginner-friendly, has great tutorials, and lets me easily debug a cat-vs-dog classifier.

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?

Recall: If there were 12 spam emails in total, how many did it catch?

(use same example)

F1 Score: Use the formula and calculate (round to 2 decimals).

MSE/MAE: Predict your friend’s age (actual = 15, prediction = 18). Which

metric punishes the error 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?

Answer:

* **Precision**: 7 out of 10 marked spam were correct → **Precision = 7 / 10 = 0.70**
* **Recall:** 7 out of 12 real spam were caught **→ Recall = 7 / 12 = 0.58**
* **F1 Score:**

F1 = 2 x Precision x Recall = 2 x 0.70 x 0.58 = 0.63

Precision + Recall 0.70 + 0.58

* **MSE vs MAE (actual = 15, predicted = 18):**

MAE = |18 - 15| = 3  
MSE = (18 - 15)² = 9 → MSE punishes more

* **BLEU vs ROUGE:**

BLEU focuses on exact word overlap, so it would give a higher score for “Cat is on the mat.”

### Part 5 — Responsible AI & Explainability

You built an AI that predicts loan approvals.

A customer asks, “Why was my loan rejected?”

Answer:

Your loan was rejected because your monthly income was too low compared to the requested loan amount, based on your financial details, the risk of not repaying the loan is high which indicates a higher risk for the bank