Task: “Build & Judge a Mini AI”

**Part 1 — Chronology of AI**

**Write one real-world example for each stage:**

**Machine Learning →** Email Spam Detection: classifying emails as spam or not using identifying the patterns in the data.

**Deep Learning →** Voice Assistants: Voice Assistants like Siri, Google assistant recognize speech through neural networks.

**Computer Vision →** Self Driving Cars: detecting the lanes, pedestrians and traffic signals.

**NLP →** Sentiment analysis: identifying positive and negative emotions in text.

**LLMs →** ChatGPT: generating human-like responses for conservations.

**Part 2 — Deep Learning Architectures**

**Match the model to the use case:**

**1. RNN -** Image recognition

**2. LSTM -** Text translation (old Google Translate)

**3. CNN -** Early speech-to-text systems

**4. Transformer** - Predicting the next word in ChatGPT

**Use cases:**

**Image recognition**

**Text translation (old Google Translate)**

**Predicting the next word in ChatGPT**

**Early speech-to-text systems**

**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.**

Ans.

I would use Keras because it is beginner-friendly, has a simple high level API to quickly build and train models for making cat vs dog classifier, and also still provides the power of TensorFlow under the hood for efficient training.

**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?**

Ans. If the model marked 10 Emails as spam and 7 are truly spam so the precision is 70%

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

**(use same example)**

Ans. If there were 12 spam emails in total and the model found 7 of them then recall would be 7/12=0.58 that means 5 were missed spam emails.

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

Ans. F1=2\*(p\*r)/(p+r) = 2(0.70\*0.5833)/(0,70+0.5833 )=0.64

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

**metric punishes the error more?**

Ans. Predicted-actual=18-15=3, so an error of 3 is there.

MAE= |3|=3

MSE= 3^2= 9

Therefore MSE punishes larger errors more because of the square.

**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?**

Ans. BLEU would score higher because many words match exactly, while ROGUE would penalize the missing words like “sat” and “the”.

**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”).**

If a customer asks why their loan was rejected, I’d explain the top reasons clearly — for example, their debt-to-income ratio was too high, or their credit history was too short. Your loan was not approved because your income was significantly lower than what is typically required for the loan amount you requested. This helps ensure that repayments remain manageable and avoid financial strain. If your financial situation changes or if you'd like to apply for a smaller amount, we’d be happy to reassess. I’d also tell them what could improve their chances next time, like reducing outstanding debt or providing more income proof. On top of that, I’d mention that the model doesn’t use sensitive factors like gender or race, and that they always have the option for a human review. That way, the customer feels informed, respected, and has a clear next step.