Task: “Build & Judge a Mini AI”

Part 1 — Chronology of AI

Q) Write one real-world example for each stage:

1. Machine Learning → Email Spam Detection
2. Deep Learning → Pro-track AI
3. Computer Vision → Missing Person Detection
4. NLP → Grammar Correction Bot
5. LLMs → ChatGPT by OpenAI

Part 2 — Deep Learning Architectures Match the model to the use case:

Q) 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

Q) Choose one framework (PyTorch / TensorFlow / Keras).

Q) In one sentence, explain why you would use it if you were a student making a

cat-vs-dogclassifier.

Answer: I’d choose **Keras** because it’s easy to learn, has a clean and user-friendly interface, and allows me to quickly build and train a cat-vs-dog image classifier using ready-to-use components. Keras is ideal for beginners because it offers a high-level, intuitive API, allowing you to build and train models with just a few lines of code unlike TensorFlow which can be more verbose, and PyTorch, which is more flexible but requires deeper understanding of model internals.

Part 4 — Evaluation Metrics

Imagine you built a spam filter.

Q) Precision: If it marks 10 emails as spam and 7 are truly spam → what's Precision?

Answer:

Definition: Out of all emails marked as spam, how many were actually spam?

Given: 10 emails marked as spam, 7 are truly spam.

Formula:
Precision = True Positives / (True Positives + False Positives)

=7/10

= 0.70

Q) Recall: If there were 12 spam emails in total, how many did it catch? (use same example)

Answer: It caught **7 spam emails**.

Definition: Out of all actual spam emails, how many did the filter catch?

Given: 12 spam emails in total, 7 were caught.

Formula:
Recall=True Positives / True Positives + False Negatives

=7/12

≈0.58

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

Answer:

Formula:
F1 Score=2×(Precision×Recall)/(Precision+Recall)

=2×(0.70×0.58)/(0.70+0.58

≈0.63

Q) MSE/MAE: Predict your friend's age (actual = 15, prediction = 18). Which metric punishes the error more?

Answer: **MSE punishes the error more than MAE**

Actual Age: 15

Predicted Age: 18

Error: 3 years

MAE = (18-15) = 3

MSE = (18−15)^2 = 9

Q) 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: **ROUGE would give a higher score because it rewards overlap in important words even if the structure differs.**

Original: "The cat sat on the mat"

AI Output: "Cat is on the mat"

BLEU : Precision of n-grams : Lower (missing "sat", "the")

ROUGE : Recall of n-grams : Higher (captures key words like "cat", "mat")

Part 5 — Responsible AI & Explainability

Q) 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").

Answer: Your income was below the required level for the loan amount you applied for.

Your credit score did not meet the bank's minimum threshold. The AI model checks financial risk based on income, credit history, and loan size. These rules are applied equally to all applicants to ensure fairness. You can improve your eligibility by increasing your credit score or applying for a smaller loan. A manual review is available if you'd like more personalized feedback.

We're here to help you understand and improve your chances next time.