🔥 Build a Smart Prompt Router (Mini Agent)

🧠 Route user prompts to the right model automatically
Duration: 5 days

📌 Challenge Description

In real AI systems (ChatGPT, Claude, Gemini...), user prompts are not always sent to one model
Instead, companies use **routing agents** that decide:

- Should this prompt be translated?
- Is it a summarization task?
- Is the user asking for sentiment analysis?
- Is it a classification request?
- Or a general chat request?

Your mission is to build a **mini version of this system**, called a **Prompt Router**.

It will:

1. Receive a prompt (text input)
2. Detect the **intent** (translation / summarization / sentiment / Q&A / general chat)
3. Route it to the **right small model** (Tiny-MT5, DistilBERT, rule-based scripts...)
4. Return the final processed answer

This project lets you build a **baby agent** that resembles a real production AI workflow.

🎯 Objectives

✓ Train or finetune a classifier to detect the prompt's intent

Based on a dataset of 500 labeled examples

✓ Implement routing logic

Depending on the predicted class, call the right model:

- *Translation* → Helsinki-NLP OpusMT
- *Summarization* → T5-small
- *Sentiment* → DistilBERT sentiment model
- *Q&A* → DistilBERT QA
- *General Chat* → rule-based or a small generic LLM

✓ Build a simple interface

✓ Demonstrate routing with 10+ example prompts

📦 Dataset

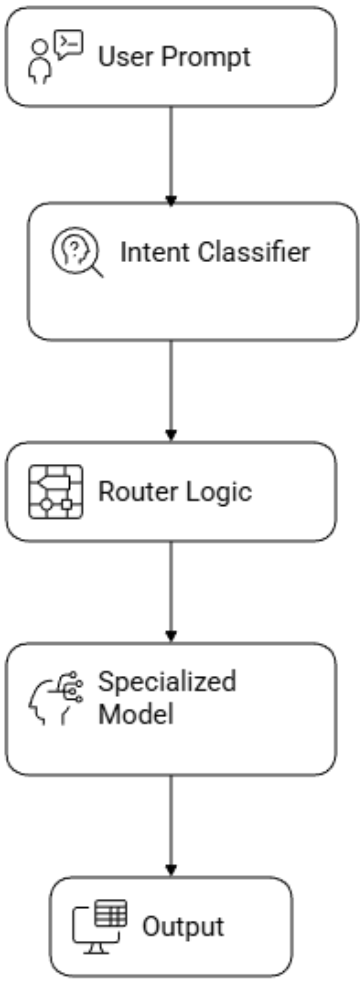
A dataset of **500 labeled prompts** in 5 classes:

Intent	Description
translation	The prompt asks to translate a text
summarization	The user wants to summarize something
sentiment	The user asks for emotion/sentiment detection
qa	The user asks a question requiring factual/directed answer
chat	Any general instruction or conversation

📚 Dataset Format

There are two available formats, choose the one that works best for you: JSON or CSV

🧱 Architecture



Example Routing :

- **translation** → "Helsinki-NLP/opus-mt-en-fr"
- **summarization** → "t5-small"
- **sentiment** → "distilbert-base-uncased-finetuned-sst-2-english"
- **qa** → "distilbert-base-cased-distilled-squad"
- **chat** → rule-based ("Hello!", "Tell me more...")

Note: *These are just* ***suggested models****. You are* ***free to choose any model or method*** *you prefer for each intent. The focus is on* ***building a working prompt router****, not strictly using these exact models.*

🛠 What Must Do (Steps)

1. Train a text classifier : you can use any simple classifier**,** *the goal is to predict the correct intent*

2. Create routing logic

Using Python if/else or a dictionary:

```
router = {
  "translation": translate_function,
  "summarization": summarize_ function,
  "sentiment": sentiment_ function,
  "qa": qa_ function,
  "chat": chat_ function
}
```

3. Connect small models

Use HuggingFace pipelines for simplicity

4. Build an interface

5. Provide examples

At least 10 demo prompts showing correct routing.

📝 Deliverables

1. Jupyter Notebook

Containing:

- Training the classifier
- Evaluation
  Evaluate the classifier using Accuracy + Macro F1-score computed on the test set
- Router implementation
- Examples

2. Python Router Script (router.py)

The final mini agent.

3. Interface

4. README.md

Explaining: (don't write a lot pleaseeee)

- Project
- How to run
- Models used
- Examples

🏆 Evaluation Criteria

Criteria	Weight
Classifier accuracy	30%
Routing correctness	30%
Quality of results	20%
Interface & usability	10%
Creativity (extra intents?)	10%

Good Luck 🌸