AI Engineer Assignment — Gen AI + Agentic AI Challenge

Objective

Design and implement a chatbot that can guide users through a decision tree based on their intent to buy or sell a home. The flowchart provided outlines the customer journey and decision paths the chatbot should follow.

This challenge evaluates your understanding of **Generative AI**, **Agentic AI frameworks**, and how you architect intelligent, context-aware systems.

Resources Provided:

1) **Flowchart (Customer Interaction Logic) as a png file**
2) **List of 100 eligible postcodes as a .csv file**

What You Need to Build:
A **chatbot agent(s)** that:

- Understands if a user wants to **buy** or **sell** a home.
- Handles both **new home** and **re-sale home** buying logic as well as selling logic.
- Validates user inputs like **budget** and **postcode**.
- Responds appropriately if certain criteria aren't met (e.g., budget < 1 million, unsupported postcode).
- Offers **reassistance** when the user wants to continue chatting.
- Offers a polite **closure** when interaction ends.

The chatbot should reflect all decision paths exactly as shown in the provided diagram.

Coding Requirements

- Use **Agentic AI principles** (e.g., tools, memory, structured agents etc).
- Incorporate **Generative AI** (LLMs) for conversational understanding.
- Can be built using:
    - LangChain, Langgraph, CrewAI, AutoGen, or similar.
    - Groq Cloud, OpenAI, Hugging face, or any other LLM providers.
    - Python
- Use the **provided list of UK postcodes** to determine if a postcode is eligible.
- Interface to test the bot (doesnt have to be extremely fancy), can be on cmd or code cell in your notebook
- The output can be as a .ipynb or .py file

Bonus (only if time permits) :

- Create the front end (simple streamlit app) and backend (fastapi / flask)