🧠 Startup Idea Marketability Evaluator

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1. 📘 Project Overview

Objective:
To build an intelligent AI-powered tool that evaluates the *market potential* of a startup idea by comparing it with real-world funding trends, domains, and known startup data using advanced **LLM reasoning through an autonomous agent**.

The agent is built using **LangChain's LLMChain** framework and powered by **Gemini Pro**, enabling it to simulate the behavior of a venture capital analyst.

Outcome:
The system outputs a **Marketability Index** along with a generated **summary report**, and displays a visual **bar chart**, all integrated into a web-based interface built with Streamlit.

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2. ⚙️ Technical Flow (LangChain + Agent Workflow)

This application uses **LangChain** and **Gemini AI** to power a simulated *VC Analyst Agent* that reasons over unstructured startup ideas and returns structured insights.

🔄 Step-by-Step Backend Flow:

1. **User Input:**
   A user enters their startup idea, including:
   - Title
   - Description
   - Target Industry
   - Area of Interest
   - Technologies (up to 3)
2. **Prompt Engineering (LLMChain):**

- A `PromptTemplate` is dynamically created to frame the user's startup in the context of domain trends.
- This prompt is passed into a **LangChain LLMChain**, which combines the prompt with the Gemini Pro LLM.

3. **Agent Reasoning (LLM Output):**
   - The Gemini model performs reasoning over:
     - The concept and its novelty.
     - The strength of the tech stack.
     - Domain viability and market saturation.
     - Funding trends and competitive landscape.
   - It outputs:
     - A **Marketability Score** (0–100)
     - A detailed **Summary Report** (with reasoning)
     - Top 3 closest domains from startup data.
4. **Crunchbase Dataset Comparison:**
   - The agent compares the idea with real-world funding data stored in `crunchbase.json`.
   - This JSON includes seed-funded startups with name, domain, and funding.
5. **Chart Generation (Matplotlib):**
   - The output data is passed to `chart_generator.py`, which creates a **bar chart** showing:
     - Marketability Index
     - Funding amounts in related domains
6. **PDF Download (Report Export):**
   - The generated report is saved as a downloadable PDF using FPDF.

- Users can export and attach it to pitch decks or product plans.

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3. 🧩 Modules Breakdown

Module	Purpose
`app.py`	Main Streamlit interface, collects input, handles end-to-end flow.
`utils/agent.py`	Defines the LangChain prompt and runs the LLMChain agent.
`utils/chart_generator.py`	Generates a bar chart using Matplotlib.
`utils/pdf_generator.py`	Generates the final downloadable report using FPDF.
`data/crunchbase.json`	Contains sample startup funding data used for market comparisons.

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4. 🧠 LLM Agent Logic in Detail

The **LLM agent** behaves like a domain analyst by:

- **Reasoning** through descriptive text.
- **Matching** startup context to related known domains.
- **Scoring** based on:
  - Domain viability
  - Tech usage
  - Investor interest (from funding data)
- **Writing a human-like summary** that is relevant and insightful.

LangChain provides modular support here through:

- `PromptTemplate` for structured queries.

- `LLMChain` to bind prompt and model.
- Gemini API for intelligent response generation.

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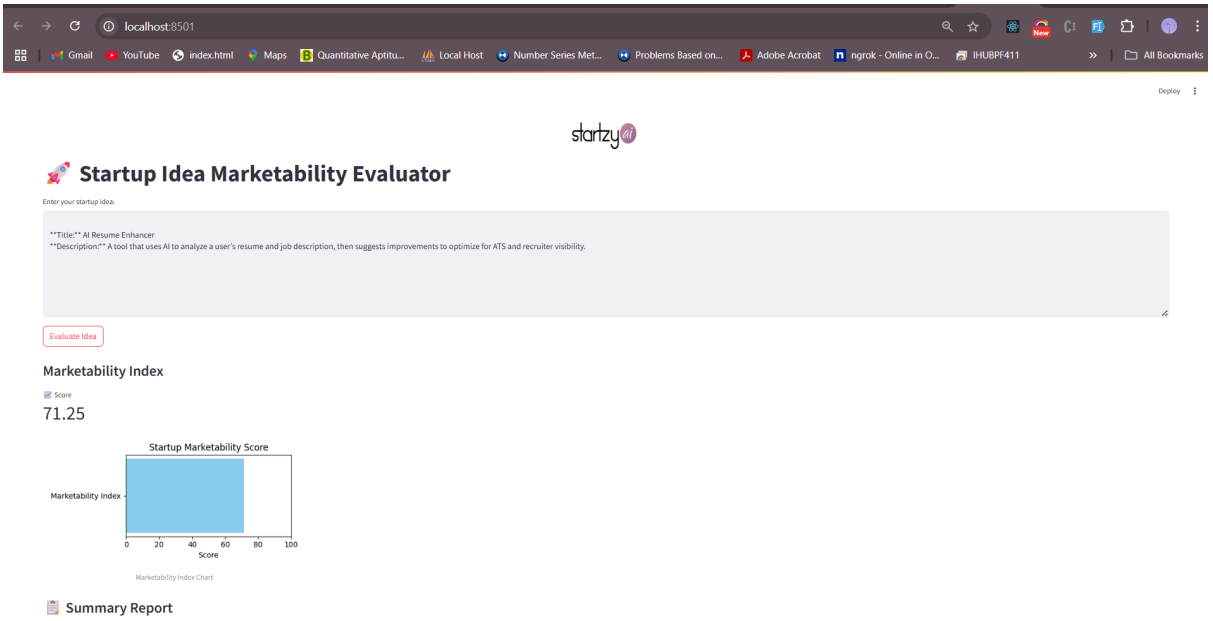
5. 📸 Screenshot



6. ✅ Final Result

The application successfully demonstrates how an AI agent (powered by Gemini via LangChain) can automate early-stage market evaluation for startup ideas. This proof-of-concept tool helps entrepreneurs validate their concepts before spending resources on development.