**HSN Code Validation Agent**

**Agent Design:**  
This agent validates HSN codes using a master list from a CSV file. It checks if a code exists and returns its description or an error.

**Data Handling & Validation:**  
The CSV is loaded once into a dictionary for fast lookups. The validation function takes a list of codes, strips spaces, and checks each against the dictionary, returning results.

**Building Steps:**

1. Load and clean the CSV data.
2. Write a validation function to check codes.
3. Create an LlmAgent in ADK with the function as a tool.
4. Run and test the agent.

**Run Instructions :**

* **Install dependencies:**  
  Make sure you have Python and required packages installed
* **pip install pandas google-adk**
* **Prepare your CSV file**
* Place your excel.csv file at the path specified in the code
* **Run your Python script**  
  Run the script that defines and starts the agent
* **python your\_agent\_script.py** (or)
* **adk web** for **dev UI**
* **Test the agent**

**Design of Agents:**

**Overall Architecture:** Google's ADK framework, which aids in structuring the agent as a language model-powered assistant, was used in its construction. It checks HSN codes using a custom function and interprets user requests using a Large Language Model (LLM).

**Important Elements:**

**Goals:** Recognise when the user wishes to verify HSN codes.

**Entities:** One or more of the actual HSN codes.

A Python function called Fulfilment Logic searches a master list loaded from a CSV file for HSN codes.

**Data Store:** The CSV file with the descriptions and valid HSN codes.

**Managing User Input:** A list of codes or a single HSN code can be entered by the agent. The input is cleaned, each code is compared to the data store, and the results are gathered**.**

**Verification**

**Google ADK**

Google ADK (Agent Development Kit) is a collection of tools that enable developers to build AI-powered assistants, referred to as agents, effortlessly, which can comprehend and act on user inputs.  
  
An LLM Agent employs a Large Language Model (LLM), such as Google's Gemini or GPT, to manage natural language and execute particular tasks according to instructions and tools you provide.  
  
In our project, we created an LLM Agent with Google ADK that checks for HSN codes — the codes utilized to categorize products for trade and taxation. We imported a list of valid HSN codes and their descriptions from a CSV file. When the agent is given one or more HSN codes, it verifies whether they are in the list and responds with the description if they are valid or an error message if they're not.  
  
This approach combines AI’s natural language understanding with our custom validation logic to quickly verify HSN codes and provide accurate feedback.