A Weekly Report

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[EC034]

[21ECUBG069]
B.Tech. SEM. VIII

In Partial Fulfillment of Requirement of Bachelor of Technology

Degree of Electronics & Communication Course

Submitted To

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Task 1 :- Google Sheets Data Entry with Python and Google APIs

Objective :-

The goal of this project is to streamline the process of adding data to Google Sheets by automating it with Python and Google APIs. This eliminates the need for manual data entry, reducing the chances of errors and saving time. The project focuses on creating a Python script that can connect to a Google Sheet, write data programmatically, and handle tasks efficiently, making it ideal for use cases like managing inventories, reports, or other data-driven operations.

Scope :-

The scope of this project involves automating data entry into Google Sheets using a Python-based solution. It includes setting up API access, authenticating through a service account, and developing a script to connect to a specific Google Sheet and append data programmatically. The project is designed to handle small to medium-scale datasets and focuses on tasks such as adding product details or similar structured information. It is limited to data entry and does not cover advanced operations like data analysis or visualization. Future enhancements could extend the script to handle bulk uploads, integrate scheduling, or process dynamic datasets from external sources.

Tools and Technology Used :-

1) Python:
   Used for writing the automation script to interact with Google Sheets.
2) gspread Library:
   A Python library for accessing and managing Google Sheets using the Google Sheets API.
3) oauth2client Library:
   Used for handling OAuth 2.0 authentication, allowing secure access to Google services via a service account.
4) Google Sheets API:
   Enables programmatic access to Google Sheets, allowing the script to read, write, and modify spreadsheet data.
5) Service Account:

A Google Cloud account used for authentication, providing secure access to the required Google Sheet.

6) JSON Key File:

   A credentials file generated in Google Cloud, containing the service account details needed for authentication.

7) Google Drive API :

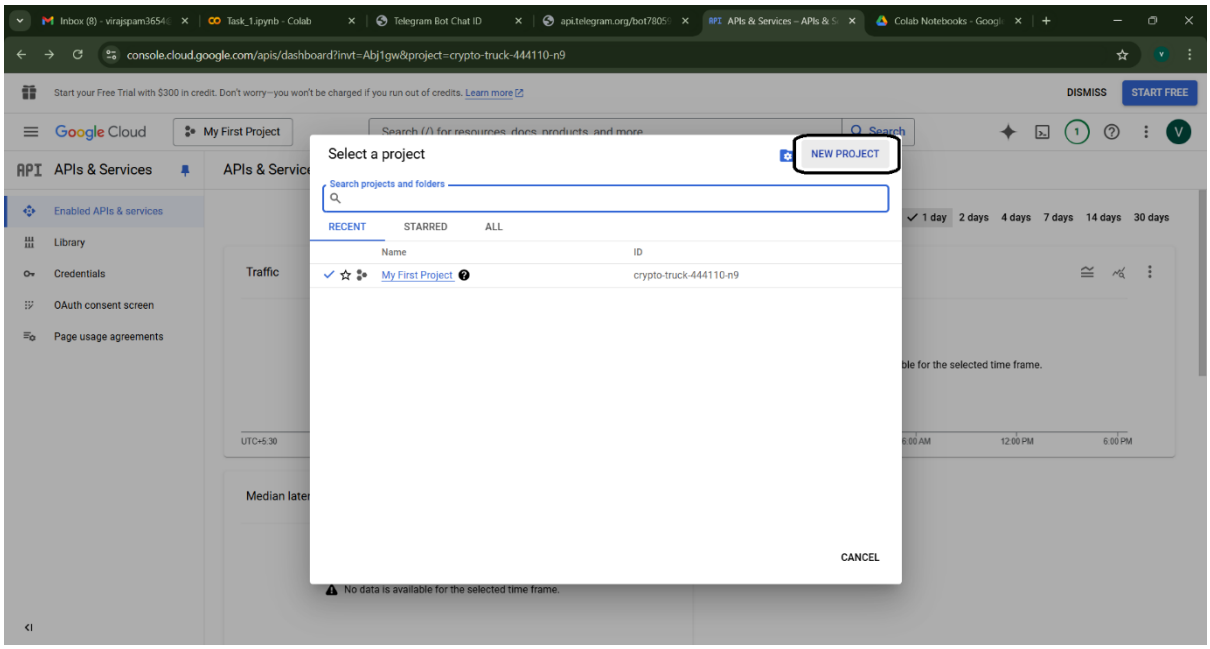
   Allows the script to manage file permissions and ensure the service account has access to the target Google Sheet.

8) Google Colab :

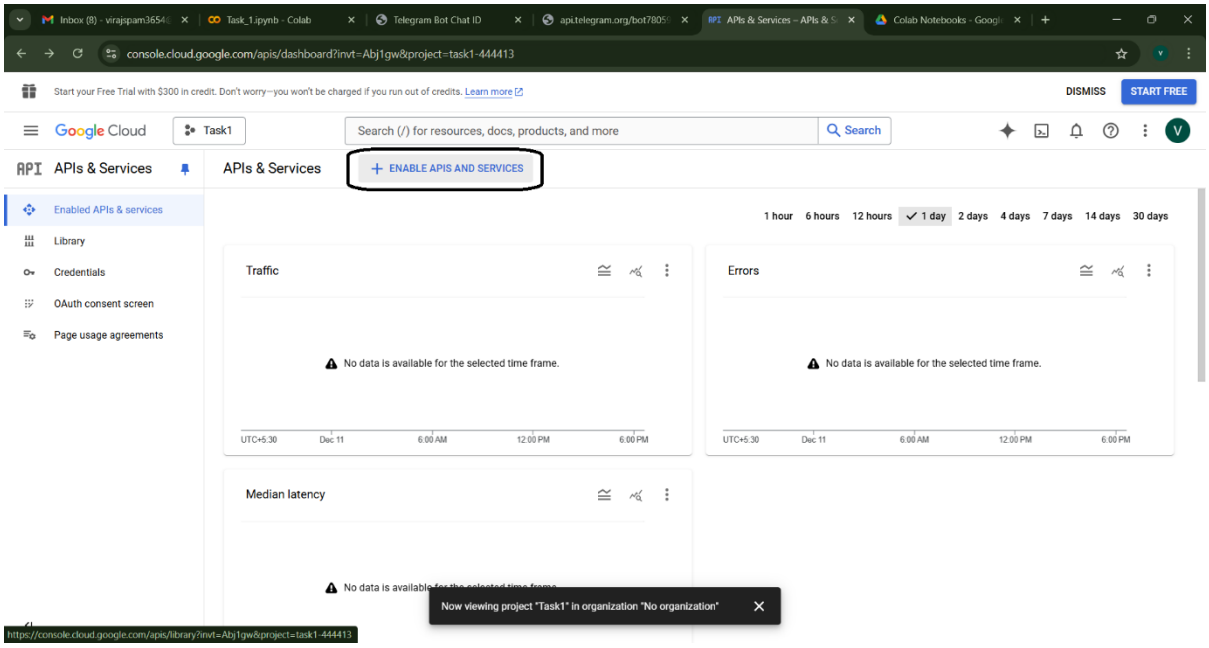
   A cloud-based Python environment used for writing and testing the script.

Project Work Flow :-

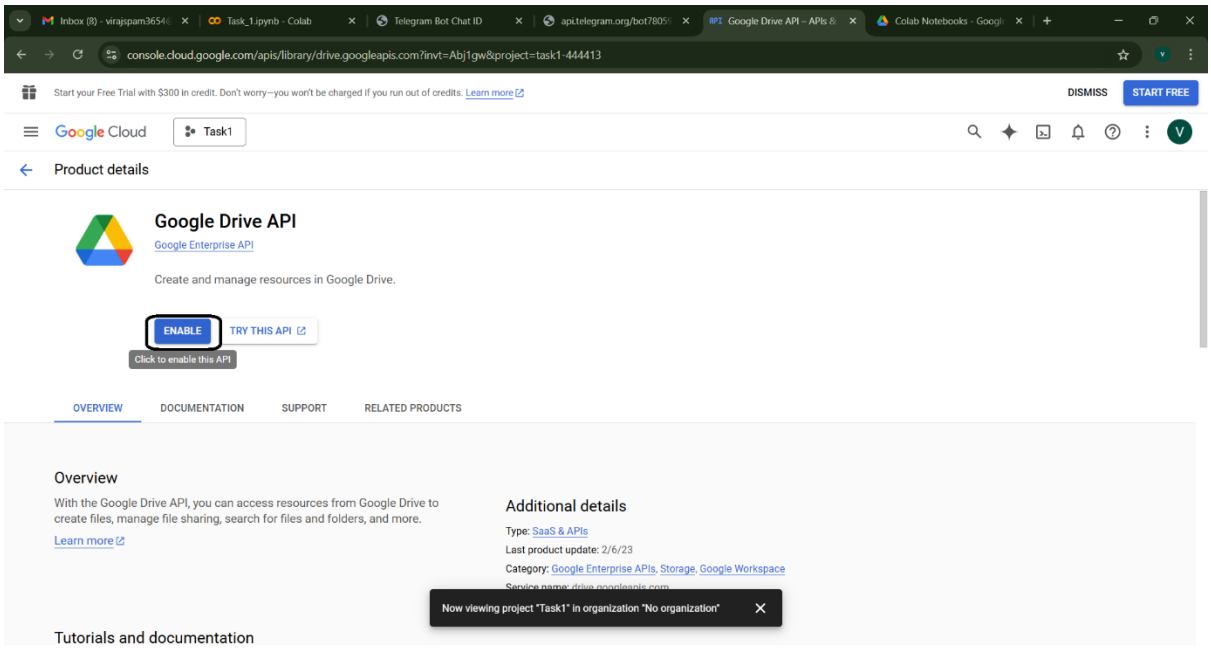
Step 1 :- Go to Google Cloud Console, click on New Project and provide Name of Project



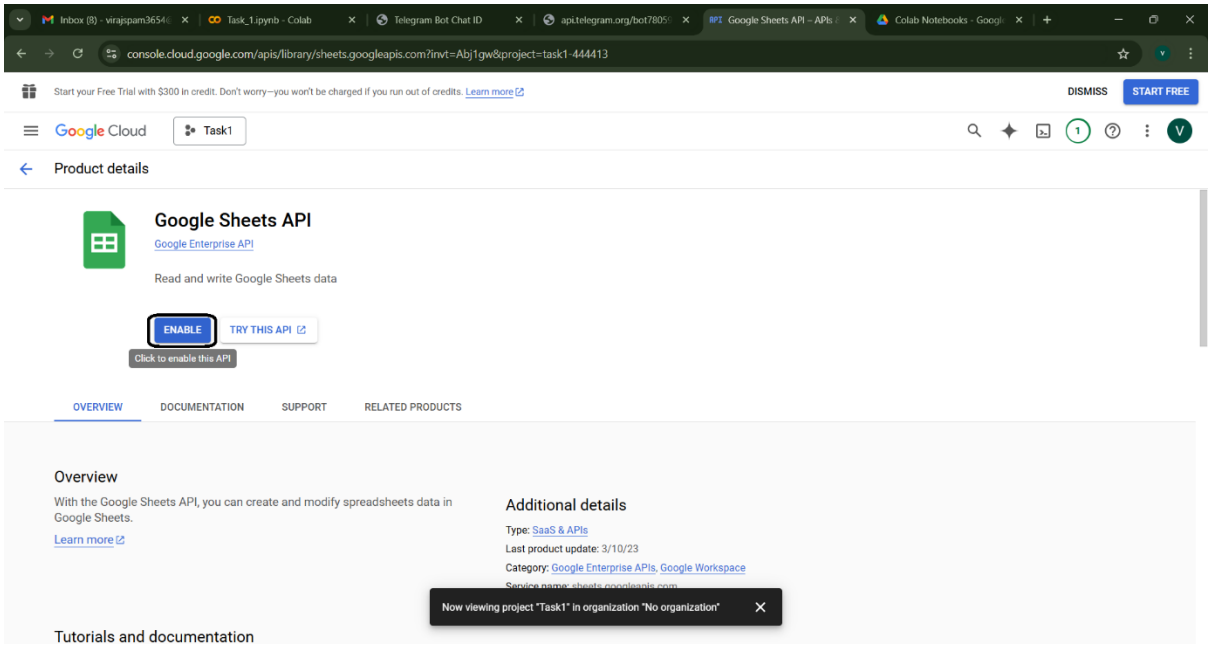
Step 2 :- Click on Enable APIs and Services



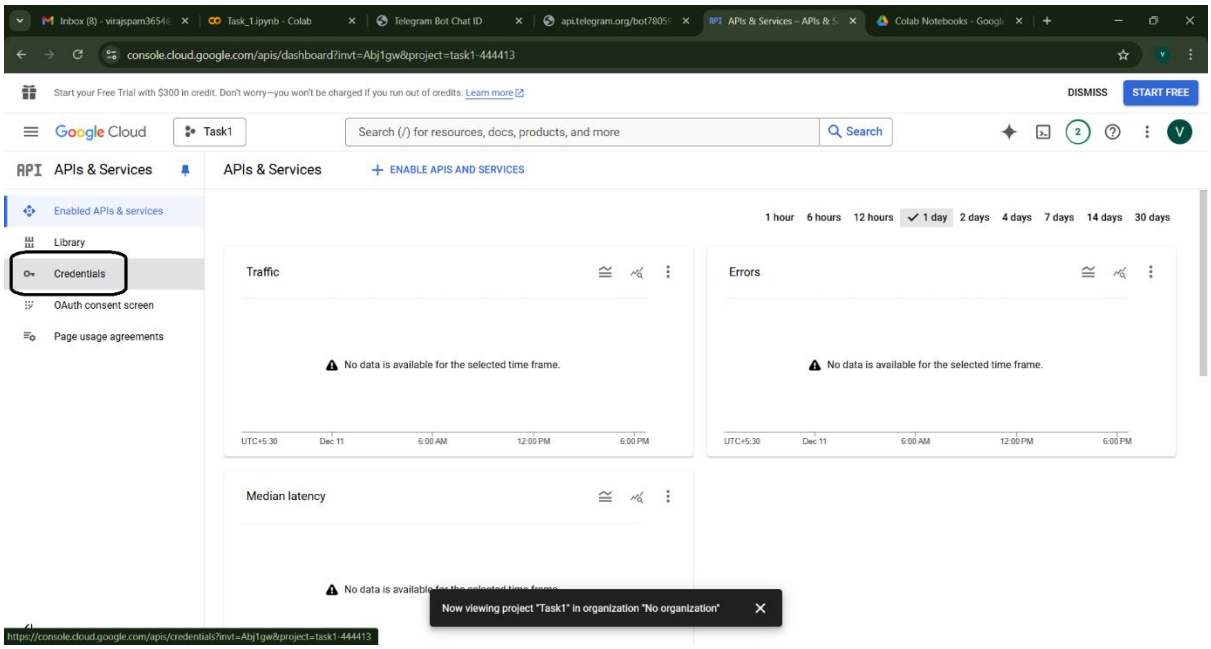
Step 3 :- Enable the Google Drive API



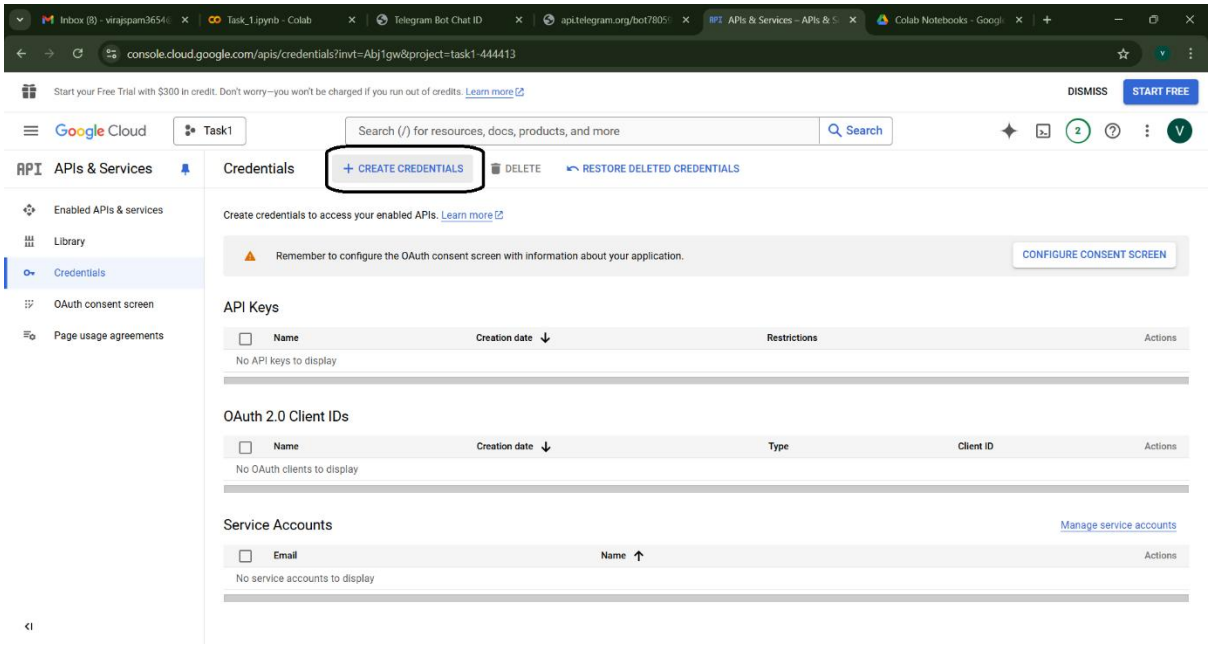
Step 4 :- Enable the Google Sheets API



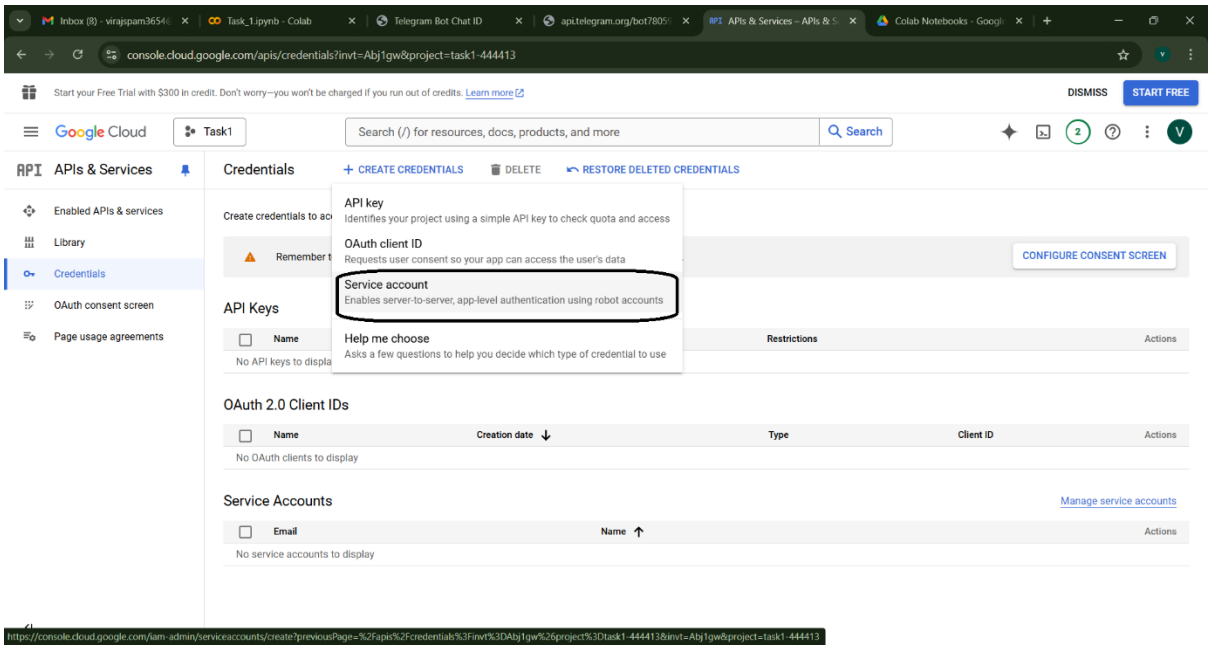
Step 5 :- Navigate to the APIs & Services > Credentials section in the Google Cloud Console.



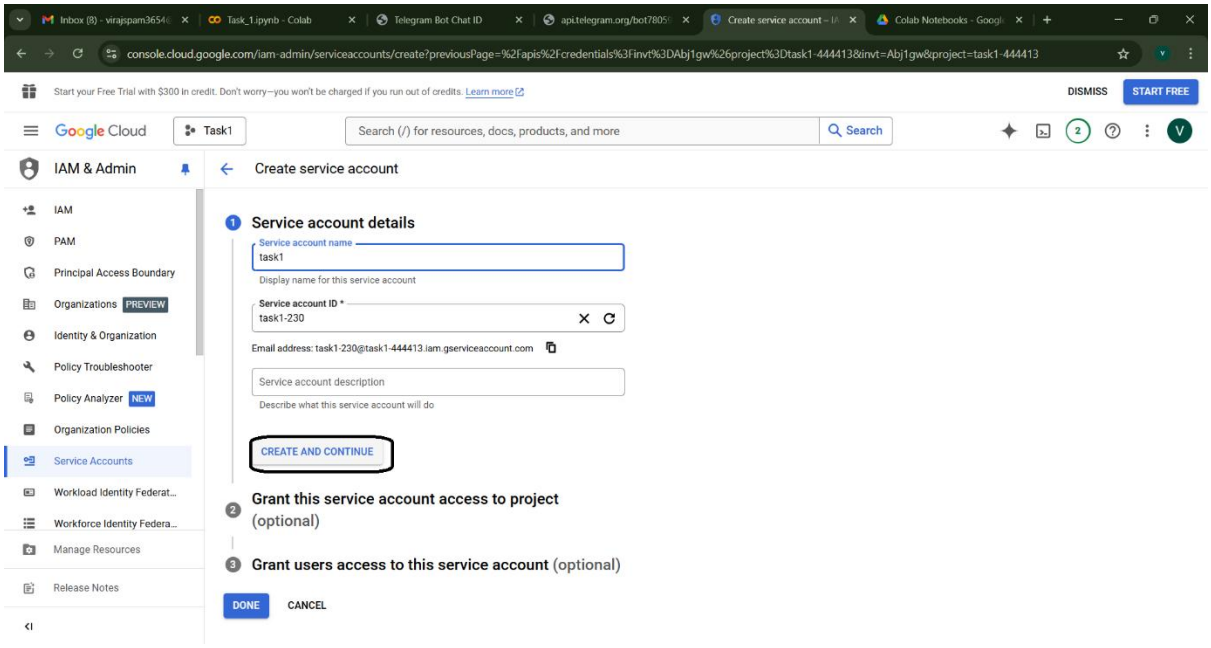
Step 6 :- Click on + Create Credentials



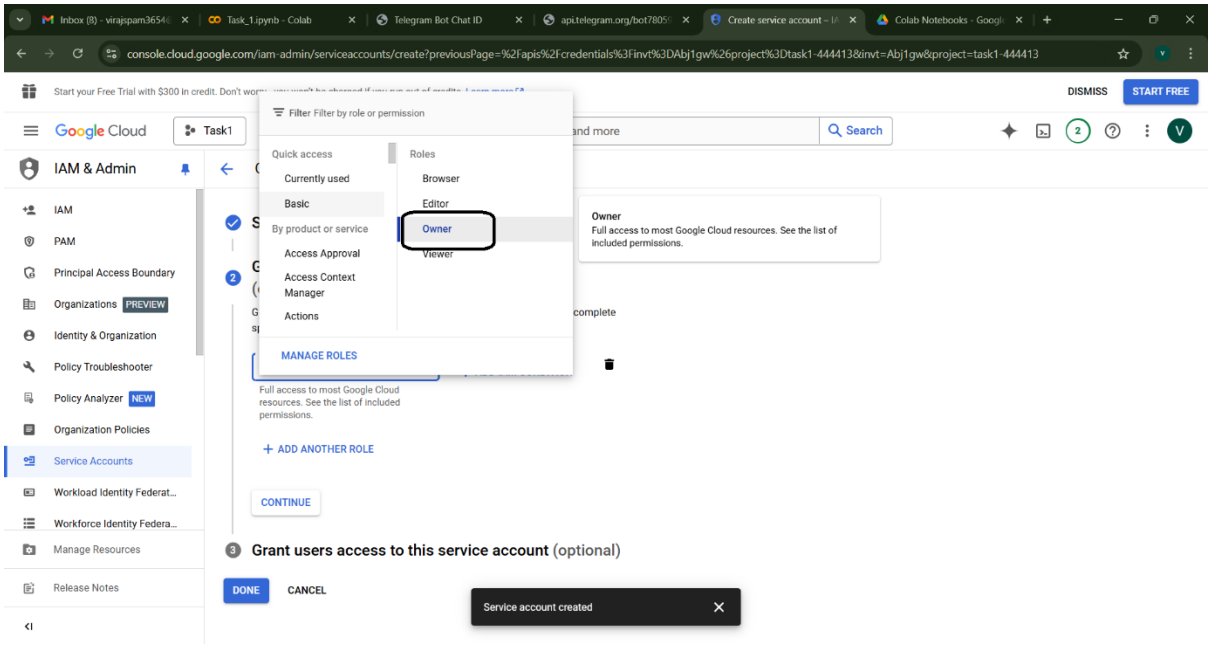
Step 7 :- And select Service Account



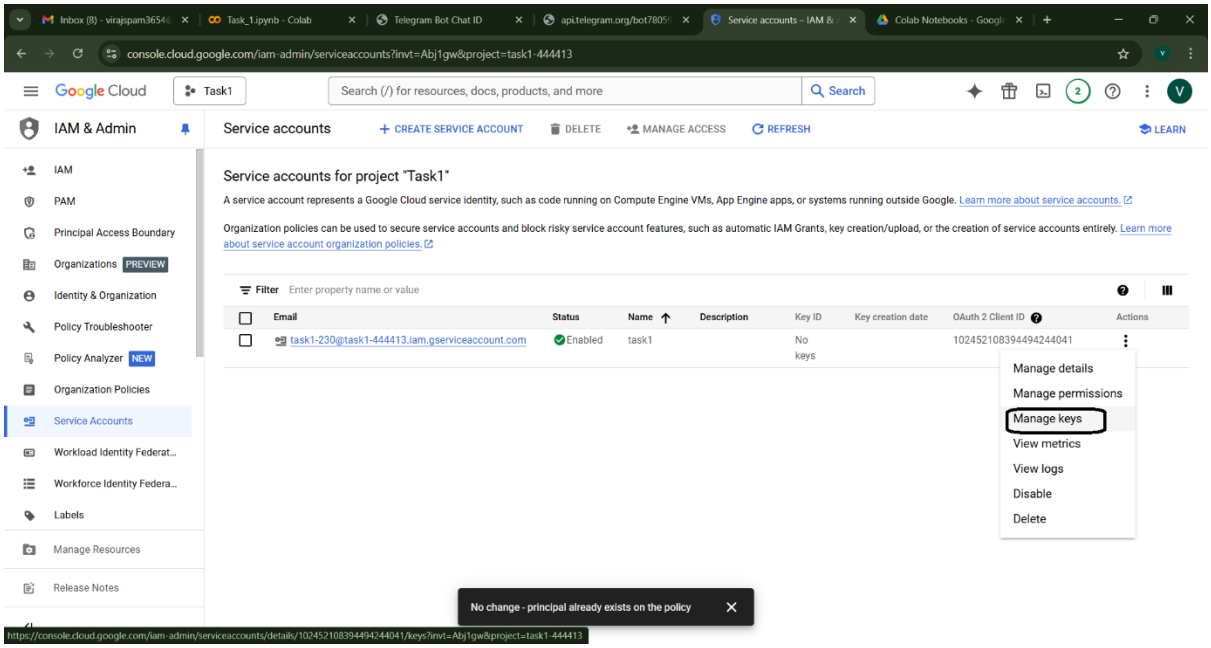
Step 8 :- Fill in the required details for the service account (name, description) and click Create.



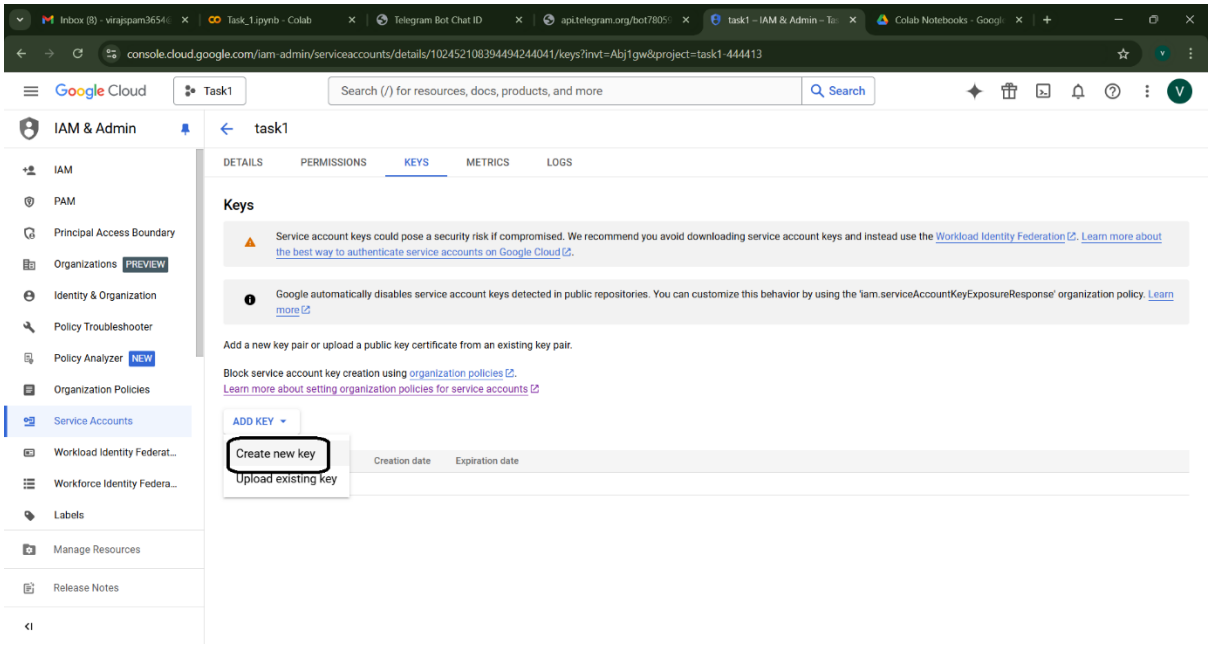
Step 9 :- Under the "Role" section, assign the service account a role, such as Editor or Owner. Complete the process, and in the last step, click Done.

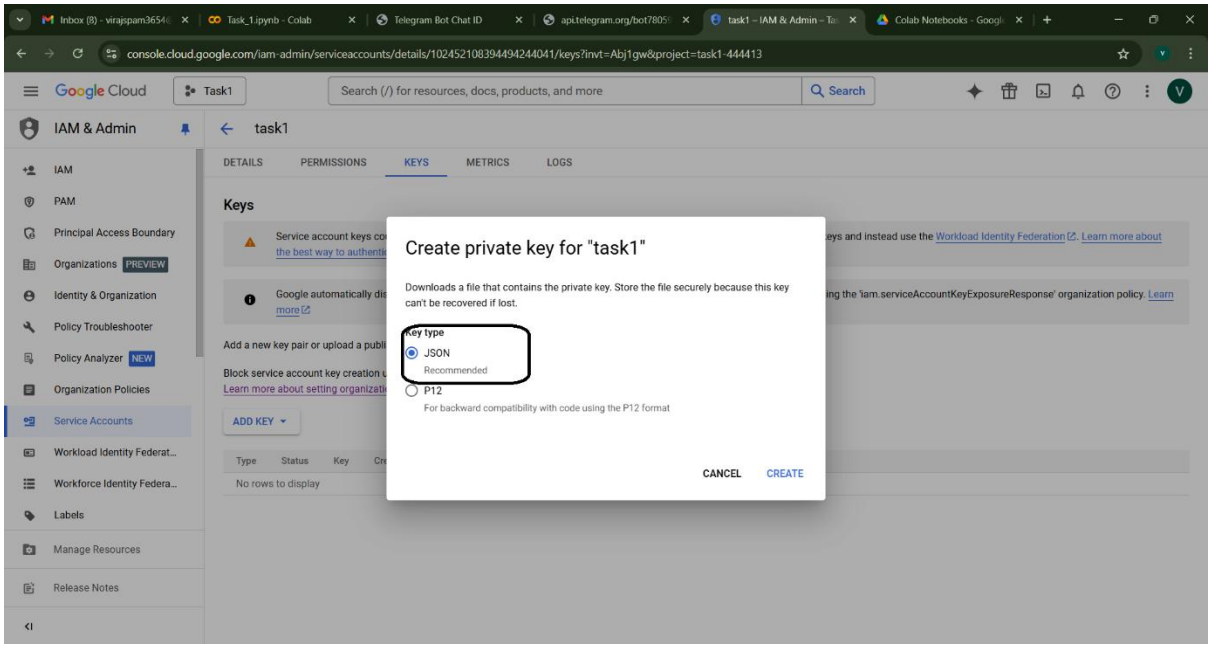


Step 10 :- After creating the service account, locate it in the "Credentials" tab and click Manage Keys.

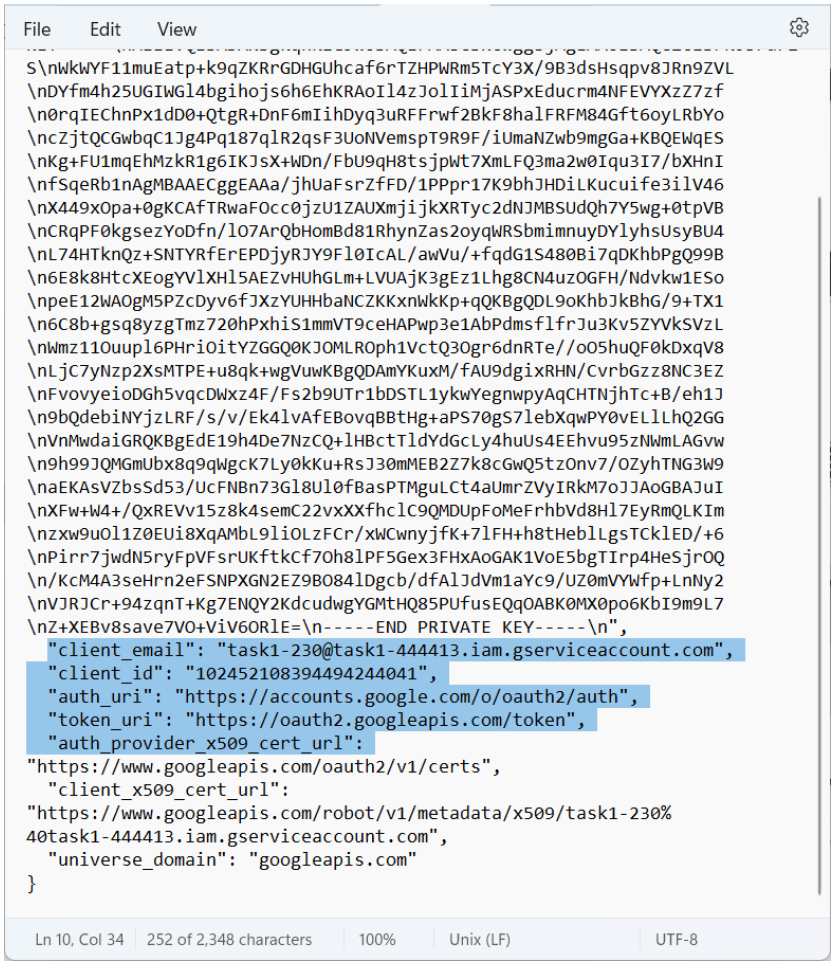


Step 11 :- Click Add Key > Create New Key, select the JSON option, and download the credentials file. And this file to Google Drive where code is present.

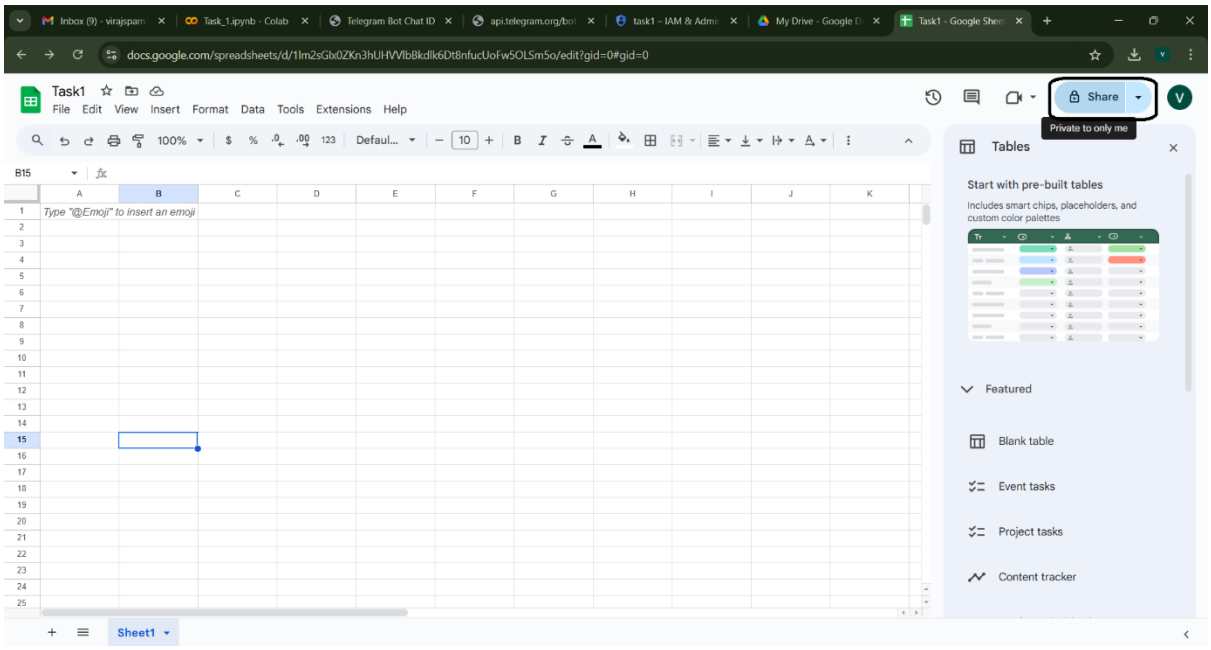




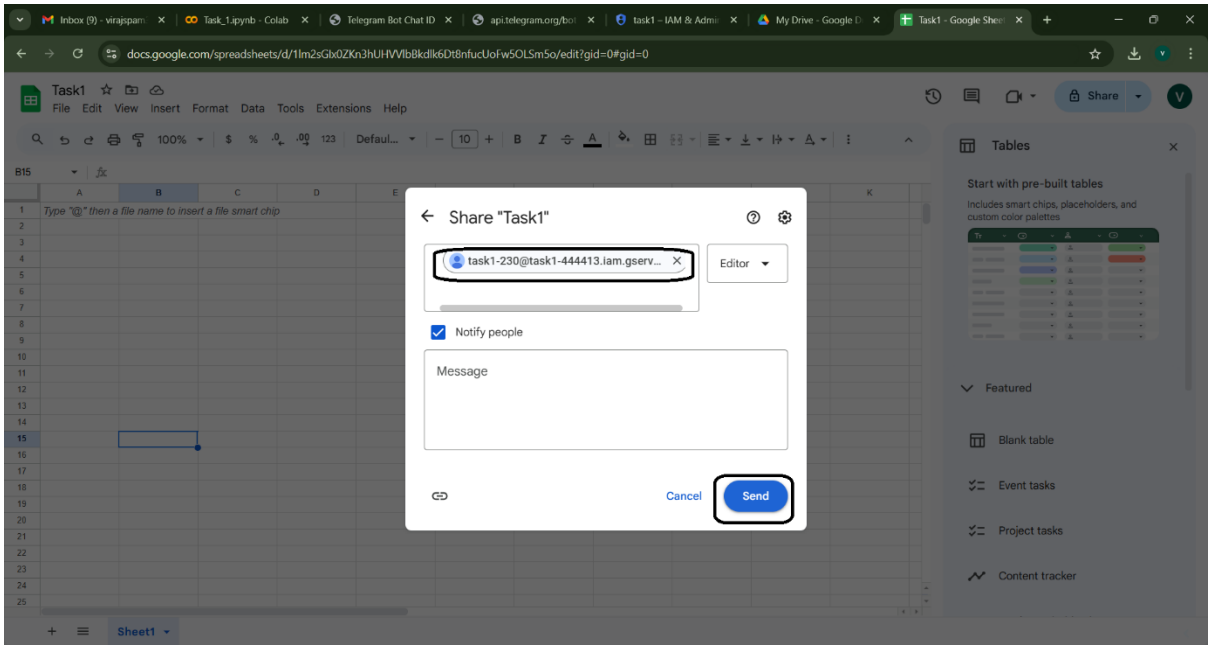
Step 12 :- Copy the email address of the service account (found in the '.json' file under the client_email field).



Step 13 :- Open the Google Sheet you want to use or create a new sheet.And Click on Share button.



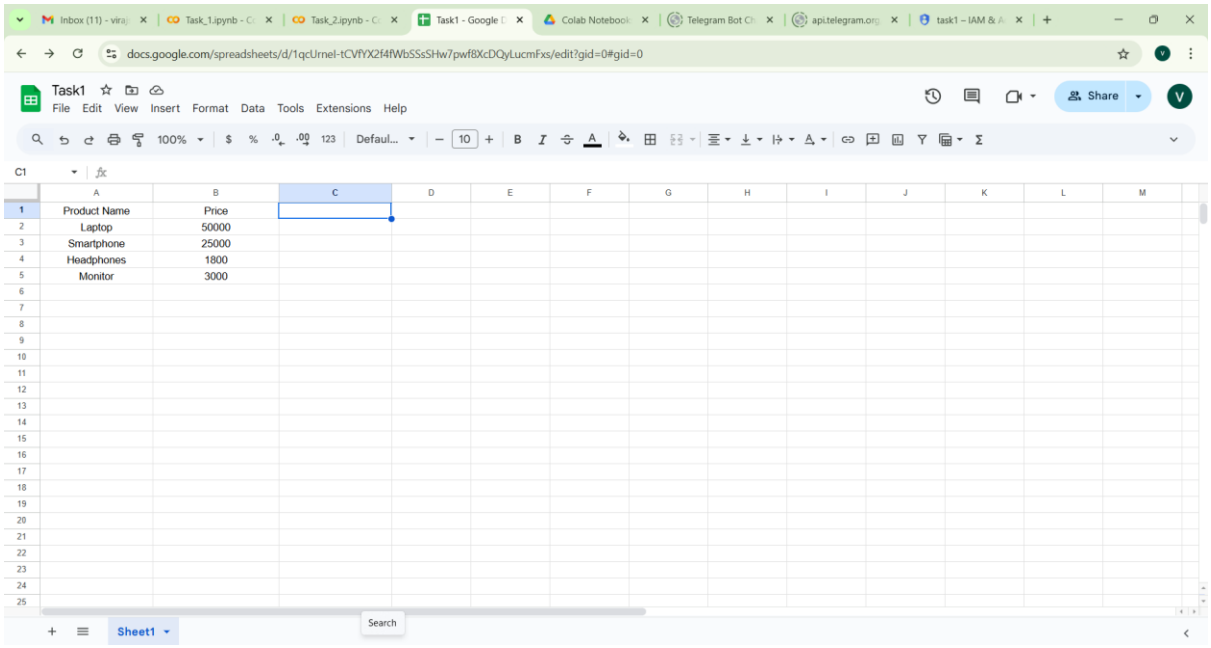
Step 14 :- Share the Google Sheet with this email address by clicking Share in the Google Sheet and granting Editor access.



Code Explanation :-

```
#Google Sheets Data Entry with Python and Google APIs

pip install gspread oauth2client

import gspread
from oauth2client.service_account import ServiceAccountCredentials

def connect_to_google_sheet(sheet_name):
    # Define the scope of the API
    scope            =            ["https://spreadsheets.google.com/feeds",
"https://www.googleapis.com/auth/drive"]

    # Authenticate using the credentials JSON file
    credentials                                                          =
ServiceAccountCredentials.from_json_keyfile_name("/content/drive/MyDrive/C
olab Notebooks/task1.json", scope)
    client = gspread.authorize(credentials)

    # Open the Google Sheet
    sheet = client.open(sheet_name).sheet1
    return sheet

def add_product_data(sheet, products):

    # Add product data
    for product, price in products.items():
        sheet.append_row([product, price])
    print("Data added successfully!")

if __name__ == "__main__":
    # Name of the Google Sheet
    SHEET_NAME = "Task1"

    # Product data
    product_data = {
        "Laptop": 50000,
        "Smartphone": 25000,
        "Headphones": 1800,
        "Monitor": 3000,
    }

    # Connect to the Google Sheet
    try:
        sheet = connect_to_google_sheet(SHEET_NAME)
        add_product_data(sheet, product_data)
    except Exception as e:
        print("An error occurred:", e)
```

Output :-



Conclusion :-

This project was a great learning experience, as it helped me understand how to use Python and Google APIs to automate data entry into Google Sheets. Overcoming challenges like API configuration and authentication taught me valuable debugging skills. The final solution simplifies repetitive tasks, making data entry faster and more accurate. It also highlighted how automation can save time and improve productivity in real-world scenarios.

Task 2 :- Automating Product Data Entry via Telegram and Google Sheets

Objective :-

The objective of this project is to develop an automated system for efficiently recording product data into a Google Sheet using a Telegram bot. This system aims to simplify the data entry process by allowing users to send product details directly through a Telegram chat, eliminating the need for manual data entry and reducing the chances of human error. By leveraging the integration of Google Sheets API for backend storage and Telegram Bot API for user interaction, the project provides a seamless, user-friendly, and accessible interface for data input. Furthermore, the bot is designed to validate and process the data accurately, ensuring data integrity and reliability. This automation enhances productivity, streamlines operations, and demonstrates the practical application of integrating messaging platforms with cloud-based tools

Scope :-

This project aims to create an automated system that simplifies recording product details into Google Sheets using a Telegram bot. It is designed for individuals, small businesses, and inventory managers who want a quick and easy way to manage product information without manual effort. Users can interact with the bot via Telegram by sending product details like name and price in a specific format. The bot checks the data to ensure it's in the correct format and then saves it directly to a Google Sheet. By combining the convenience of Telegram with the functionality of Google Sheets, this project offers a practical, user-friendly solution for streamlining data entry tasks.

Tools and Technology Used :-

1) Python:
   Used for writing the automation script to interact with Google Sheets.
2) gspread Library:
   A Python library for accessing and managing Google Sheets using the Google Sheets API.
3) python-telegram-bot:

Simplifies the development of the Telegram bot by providing tools to handle messages, commands, and other bot-related functionality

4) nest_asyncio:
   Ensures compatibility with asynchronous tasks in environments like Jupyter Notebook or Google Colab.
5) oauth2client Library:
   Used for handling OAuth 2.0 authentication, allowing secure access to Google services via a service account.
6) Google Sheets API:
   Enables programmatic access to Google Sheets, allowing the script to read, write, and modify spreadsheet data.
7) Service Account:
   A Google Cloud account used for authentication, providing secure access to the required Google Sheet.
8) JSON Key File:
   A credentials file generated in Google Cloud, containing the service account details needed for authentication.
9) Google Drive API:
   Allows the script to manage file permissions and ensure the service account has access to the target Google Sheet.
10) Google Colab:
    A cloud-based Python environment used for writing and testing the script.
11) Telegram Bot API:
    Provides the interface for creating and managing the Telegram bot, allowing it to interact with users efficiently.

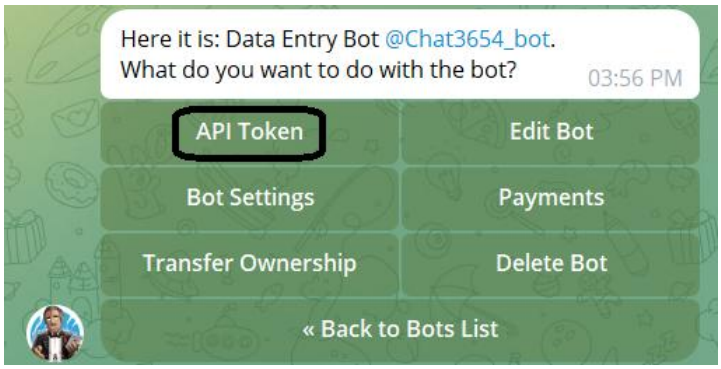
Project Work Flow :-

All Previous Steps remain same in addition to following steps.

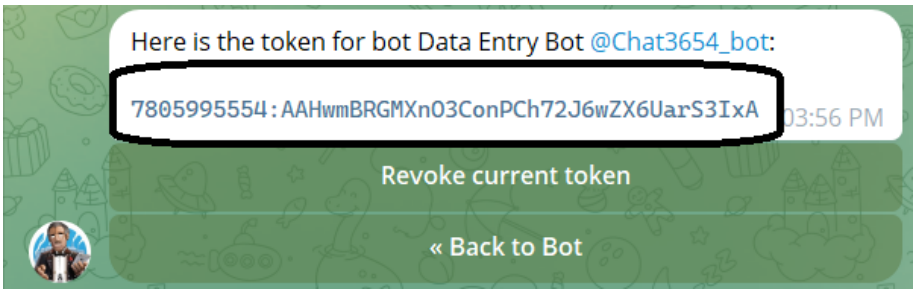
Step 15 :- Create a Bot in telegram using BotFather.

Step 16 :- Now type /mybots and select the username of bot used.

Step 17 :- Now select API Token to get bots API Token.



Step 18 :- Copy the API Token provided this will be used further to configure the bot in python script.



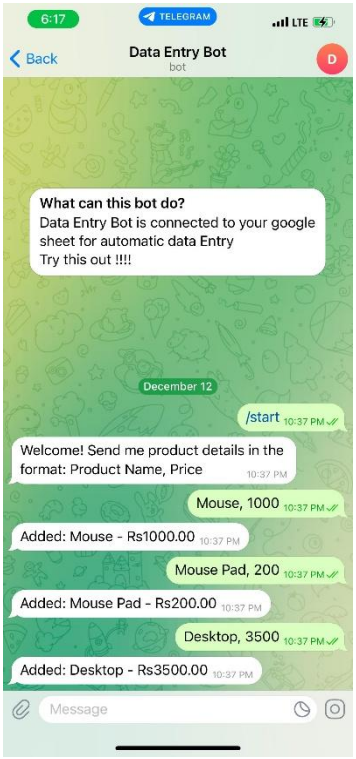
Code Explanation :-

```
# Automating Product Data Entry via Telegram and Google Sheets

pip install gspread oauth2client python-telegram-bot nest_asyncio

import asyncio
import nest_asyncio
from telegram import Update
from telegram.ext import Application, CommandHandler, MessageHandler,
filters, CallbackContext
import gspread
from oauth2client.service_account import ServiceAccountCredentials

nest_asyncio.apply()

# Google Sheets Authentication
def connect_to_google_sheet(sheet_name):
    # Defining the scope of the API
    scope = ["https://spreadsheets.google.com/feeds",
"https://www.googleapis.com/auth/drive"]
    credentials =
ServiceAccountCredentials.from_json_keyfile_name("/content/drive/MyDrive/C
olab Notebooks/task1.json", scope)
    client = gspread.authorize(credentials)
    sheet = client.open(sheet_name).sheet1
```

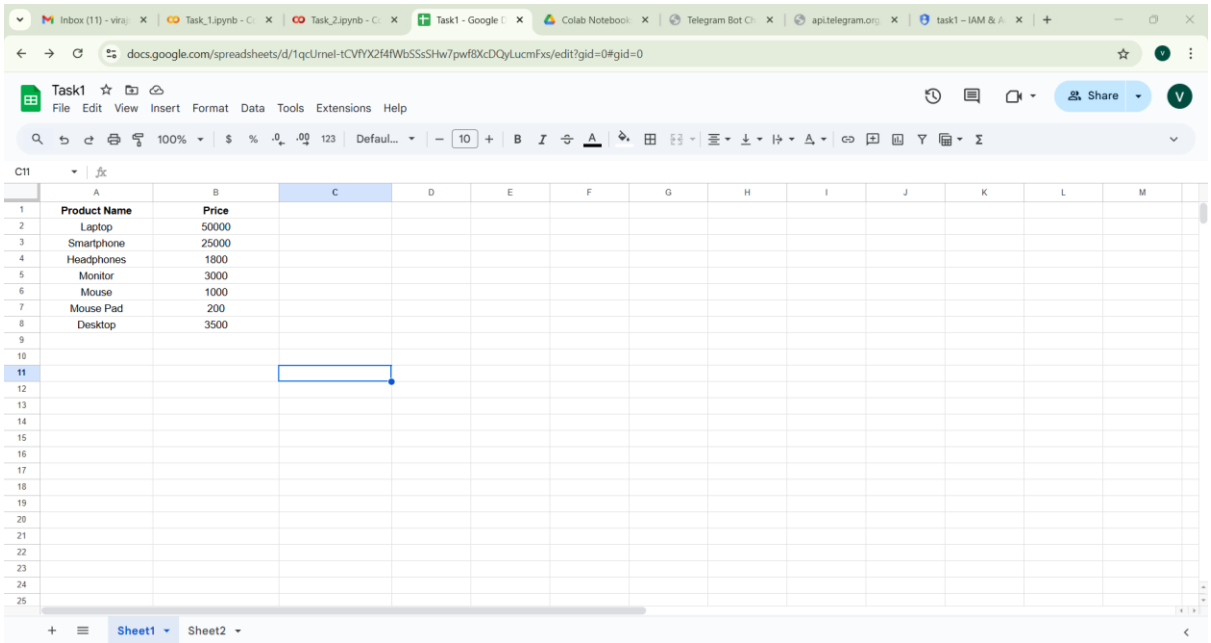
```
    return sheet

# Telegram Bot Handlers
async def start(update: Update, context: CallbackContext):
    await update.message.reply_text("Welcome! Send me product details in the
format: Product Name, Price")


async def add_data(update: Update, context: CallbackContext):
    # Extract message content
    message = update.message.text
    try:
        # Split the message to extract product and price
        product, price = map(str.strip, message.split(","))
        price = float(price)

        # Connect to Google Sheet
        sheet = connect_to_google_sheet("Task1")

        # Add the product and price to the sheet
        sheet.append_row([product, price])
        await    update.message.reply_text(f"Added:    {product}    -    Rs
{price:.2f}")
    except ValueError:
        await update.message.reply_text("Invalid format! Please send data
in the format: Product Name, Price")
    except Exception as e:
        await update.message.reply_text(f"An error occurred: {e}")

async def main():
    # Telegram bot token
    BOT_TOKEN = "7805995554:AAHwmBRGMXnO3ConPCh72J6wZX6UarS3IxA"

    # Initialize the bot application
    application = Application.builder().token(BOT_TOKEN).build()

    # Add handlers
    application.add_handler(CommandHandler("start", start))
    application.add_handler(MessageHandler(filters.TEXT & ~filters.COMMAND,
add_data))

    # Start the bot
    print("Bot is running...")
    await application.run_polling()

# Run the bot
await main()
```

Output :-

Entered Data from telegram Bot.



Output in Google Sheet.



Conclusion :-

In conclusion, this task has been an exciting journey into the world of automation, showcasing how simple tools like Telegram and Google Sheets can be combined to create powerful solutions. The ability to input product data effortlessly via a familiar platform like Telegram and have it seamlessly stored in Google Sheets feels like a small step toward making day-to-day tasks smarter and easier. Working on this project has been both challenging and rewarding, especially in understanding how APIs and asynchronous programming come together to deliver real-time functionality. It’s satisfying to see how a few lines of code can reduce manual effort, save time, and make data management accessible to anyone, regardless of technical skills.