**SMART WATER FOUNTAINS**

**1.IOT Device Deployment:**

Describe the deployment of IoT devices in the smart water fountains. Explain how these devices are connected to the Internet and how data is transmitted to Thing speak.

**2.Sensor Selection:**

List and describe the specific sensors used in the smart water fountains. Explain the role of each sensor and why it was chosen. mention the manufacturers and models of the sensors.

**3.Sensors used:**

Water level sensors to monitor water levels in the fountains. Flow rate sensors to measure water consumption. Temperature sensors for weather-based adjustments.

**4.Python Script Development:**

Provide details about the development of Python scripts for IoT devices. Include code snippets demonstrating how the scripts interact with the selected sensors and transmit data to Thing speak.

**5.Thing speak Integration:**

Explain the integration of Thing speak into the project. Describe how data is sent to Thing speak for storage and visualization. provide examples of data visualization and analysis using Thing speak.

**6.Tinkercad Simulation:**

Detail the use of Tinker cad for simulating the IoT devices and the sensor data. Include screenshots or diagrams of the Tinker cad setup. Explain how Tinker cad helped in the development and testing of the project.

**7.Data Collection and Analysis:**

Describe how data from the sensors is collected, processed, and analysed.Explain how this data is transformed into actionable insights for water management.

**8.Remote Monitoring and Control:**

Explain how remote monitoring and control of the smart water fountains are achieved, including interactions with Thing speak.

**9.Challenges and Solutions:**

Share challenges faced during the project (e.g., connectivity issues, data accuracy). explain the solutions or strategies implemented to address these challenges.

**10.Project Results:**

Present the results of the smart water fountain implementation, including data on water conservation, cost savings, or efficiency improvements**.** Included any user feedback or success stories.

**11.Future Enhancements:**

Suggest potential future enhancements or additional features that can be added to the smart water fountains, and how Thing speak and Tinker cad can facilitate these improvements.

**12.Conclusion:**

Summarize the project's success and its impact on water management and conservation. highlight the significance of IoT technology, Thing speak, and Tinker cad in addressing real-world challenges.

**Program:**

import requests

import matplotlib.pyplot as plt

THINGSPEAK\_CHANNEL\_ID = " **2303740**"

THINGSPEAK\_READ\_API\_KEY = "N9D52Y9UN2T1EXPB"

THINGSPEAK\_API\_URL =f “https://thingspeak.com/channels/2303740/api\_keys”

def fetch\_data():

try:

response = requests.get(THINGSPEAK\_API\_URL)

data = response.json()

return data

except Exception as e:

print(f"Error fetching data from ThingSpeak: {e}")

return None

def plot\_data(data):

if data:

water\_levels = [entry['field1'] for entry in data['feeds']]

timestamps = [entry['created\_at'] for entry in data['feeds']]

plt.figure(figsize=(10, 6))

plt.plot(timestamps, water\_levels, marker='o', linestyle='-', color='b')

plt.xlabel('Timestamp')

plt.ylabel('Water Level')

plt.title('Water Level in Smart Water Fountain')

plt.grid()

plt.xticks(rotation=45)

plt.show()

else:

print("No data to plot.")

if \_\_name\_\_ == "\_\_main\_\_":

data = fetch\_data()

plot\_data(data)