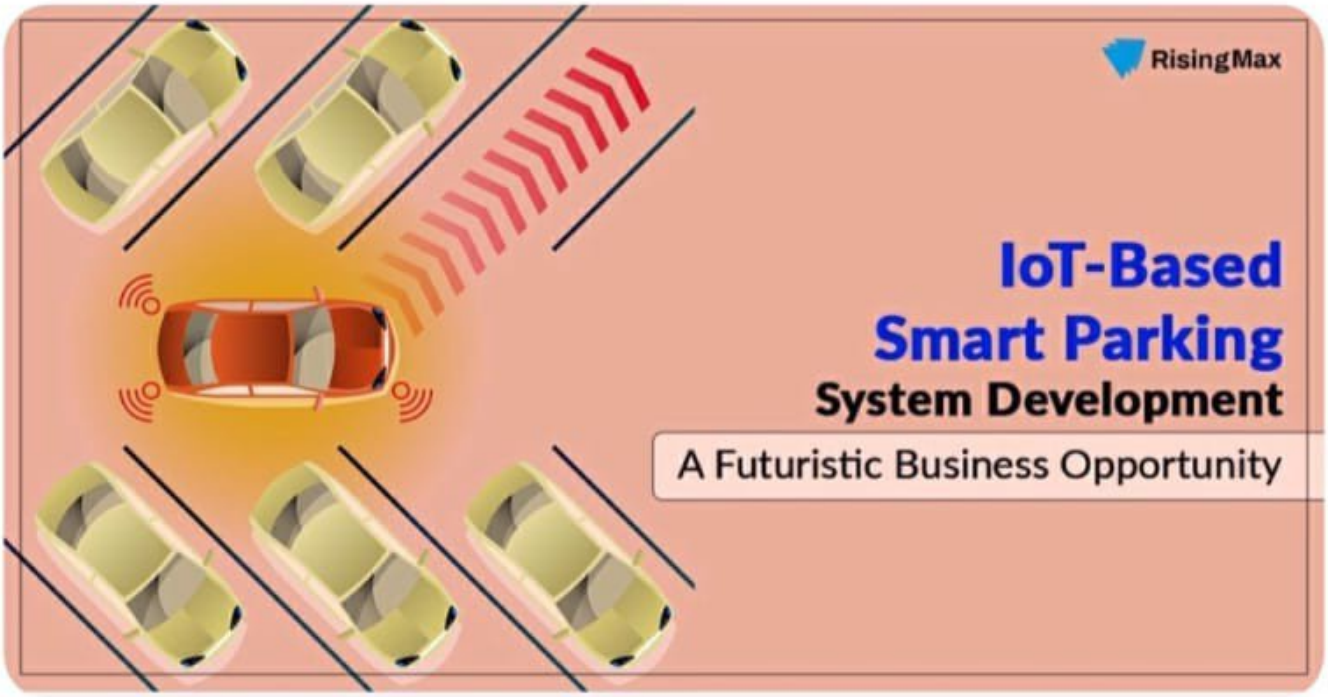
☐ PHASE-3 DEVELOPMENT PART

☐ *<°°°smart parking°°°>*

- In this technology project you will begin building your project by deploying IoT devices and then developing a Python script on the IoT devices as per the project requirement. After performing the relevant activities create a document around it and share the same for assessment.



☐ **Building a smart parking system using IoT devices involves several steps:**

1. **Define Objectives and Requirements:**

- Clearly outline the goals and functionalities you want in the smart parking system.

2. **Select IoT Devices:**

- Choose appropriate IoT devices like sensors, cameras, and communication modules that will be used to monitor parking spaces.

3. **Install Sensors and Devices:**

- Install IoT sensors in parking spots to detect occupancy, and cameras for visual monitoring.

4. **Connect IoT Devices:**

- Set up a communication network (e.g., Wi-Fi, LoRa, or cellular) to connect the IoT devices and allow them to transmit data.

5. **Develop IoT Software:**

- Create software to process data from the sensors and cameras, enabling real-time monitoring and analysis of parking occupancy.

6. **Integrate Data Processing and Storage:**

- Implement a platform to process and store data collected from the IoT devices securely.

7. **Implement Data Analysis and Insights:**

- Utilize data analytics to derive insights, such as available parking spaces and patterns of usage.

8. **Develop User Interface:**

- Create a user interface (e.g., a mobile app or a website) for users to check parking availability and make reservations.

9. **Incorporate Payment System (Optional):**

- Integrate a payment system into the user interface to facilitate payment for parking reservations.

10. **Test and Optimize:**

- Conduct thorough testing to ensure the system functions as intended, and make necessary optimizations for efficiency and accuracy.

11. **Deploy and Monitor:**

- Deploy the smart parking system in the intended locations and continually monitor its performance, addressing any issues that arise.

12. **Maintenance and Updates:**

- Regularly maintain the system, apply updates, and consider enhancements based on user feedback

- `````python coding`````

1. **Install Flask:**

   Ensure you have Flask installed by running:

   ```bash

   pip install Flask

   ```

2. **Python Script (smart_parking.py):**

   ```python

   from flask import Flask, jsonify, request

   import random

   import threading

   import time

   app = Flask(__name__)

   parking_spots = [0] * 10  # Represents 10 parking spots, initially all vacant
   ```

```
def simulate_iot_data():
    global parking_spots
    while True:
        # Simulate IoT data (occupancy: 0 for vacant, 1 for occupied)
        parking_spots = [random.randint(0, 1) for _ in range(10)]
        time.sleep(5)  # Simulate data update every 5 seconds

@app.route('/parking', methods=['GET'])
def get_parking_status():
    global parking_spots
    return jsonify({'parking_status': parking_spots})

if __name__ == '__main__':
    # Start IoT data simulation in a separate thread
    iot_thread = threading.Thread(target=simulate_iot_data)
    iot_thread.daemon = True
    iot_thread.start()
```

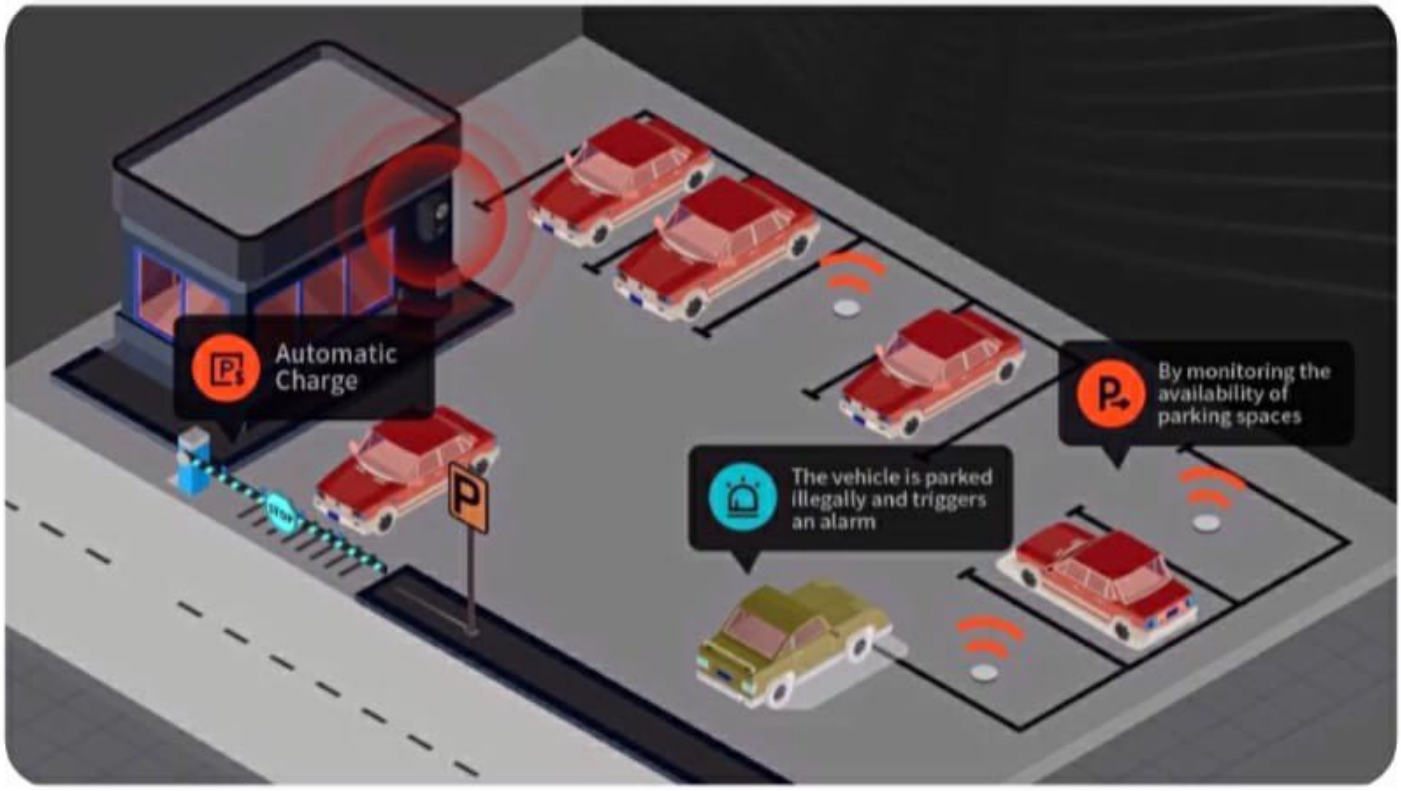
```
# Run the Flask app

app.run(debug=True)
```

3. **Run the Script:**

   Run the script using:

   ```bash

   python smart_parking.py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