IOT PHASE 5

SMART PARKING

DEVELOPMENT PART 3

Building a camera-based parking detection system with Raspberry Pi and Microsoft Azure involves multiple steps, both in terms of hardware setup and software development. I'll break down the project into a detailed, step-by-step guide:

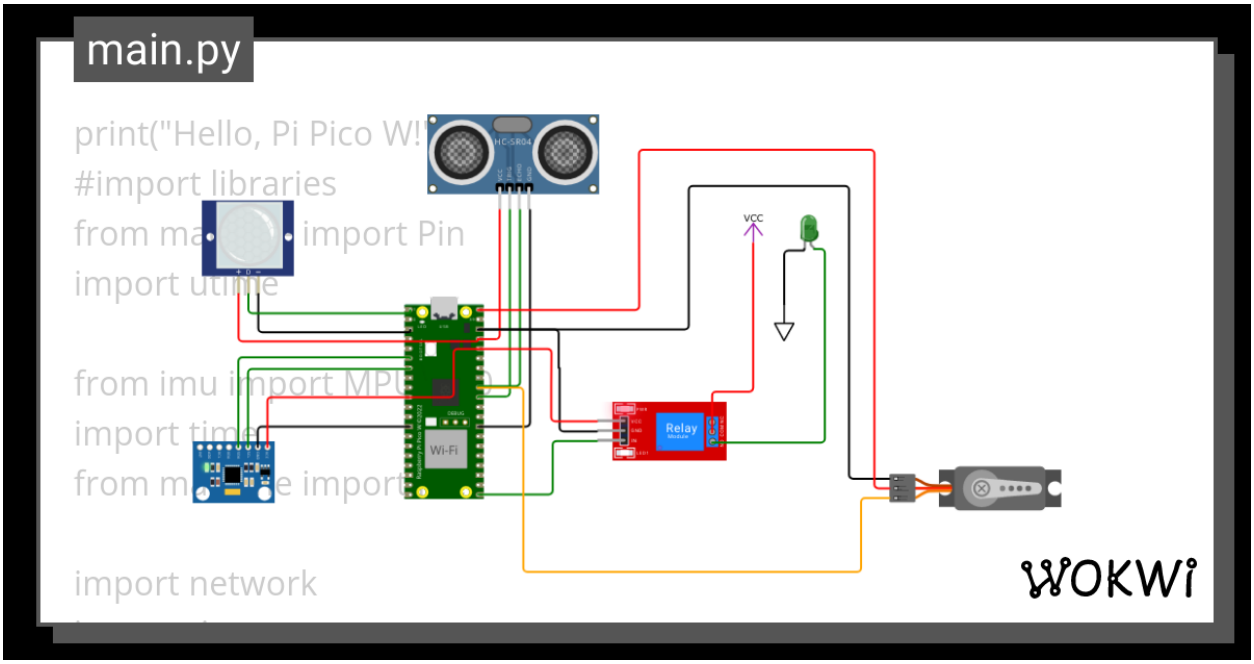
To send the parking space availability to cloud and mobile app:

```
import picamera

import cv2

import requests

import time


# API endpoint for sending parking data to the cloud

API_ENDPOINT = "https://your-cloud-server.com/api/parking"


# Initialize the camera

camera = picamera.PiCamera()


# Function to capture an image and analyze occupancy

def capture_and_analyze_image():

    # Capture an image

    timestamp = time.strftime("%Y%m%d%H%M%S")

    image_filename = f"parking_{timestamp}.jpg"

    camera.capture(image_filename)
```

```
    # Load the captured image and implement image processing

    # For demonstration, assume a simple condition for occupancy
    if True:  # Replace with your actual occupancy detection logic
        status = "Occupied"
    else:
        status = "Vacant"

    return image_filename, status

# Main loop for parking space monitoring
try:
    while True:
        image_filename, status = capture_and_analyze_image()

        # Send data to the cloud server
        payload = {"space_id": 1, "status": status, "image_filename": image_filename}
        response = requests.post(API_ENDPOINT, json=payload)

        # Sleep for a defined interval before checking again
        time.sleep(10)

except KeyboardInterrupt:
```

camera.close()

```
from flask import Flask, request, jsonify

app = Flask(__name)

# Temporary data storage (replace with a database)
parking_data = []

@app.route('/api/parking', methods=['POST'])
def receive_parking_data():
    data = request.json
    parking_data.append(data)
    return "Data received successfully", 200

@app.route('/api/parking/all', methods=['GET'])
def get_all_parking_data():
    return jsonify(parking_data)

if __name__ == '__main__':
    app.run(debug=True)
```


main.py
print("Hello, Pi Pico W!")
#import libraries
from ma import Pin
import utime
from imu import MPU
import tim
from m e import
import network
HC-SR04
VCC
Relay
Wi-Fi
WOKWi