Hardware Components:

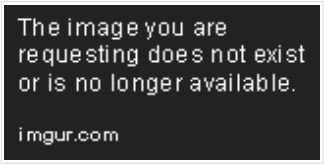
1. **ESP8266 Microcontroller:**
   - The central processing unit that controls the entire system.
   - Manages WiFi connectivity and serves as the brain for processing requests.
2. **Servo Motor:**
   - Mechanism for controlling the pet feeder's opening and closing action.
   - Attached to a designated pin on the ESP8266 for control.
3. **Webcam:**
   - Captures live video feed for remote monitoring.
   - Connected to a separate system, and its status is toggled through the ESP8266.
4. **Power Supply:**
   - Provides the necessary power to the ESP8266, servo motor, and webcam.

Software Components:

1. **Arduino Sketch:**
   - Written code that runs on the ESP8266.
   - Manages the main logic for handling HTTP requests, servo control, feeding intervals, and webcam toggling.
2. **ESP8266WiFi Library:**
   - Enables the ESP8266 to connect to a local WiFi network, facilitating communication with the web interface.
3. **ESP8266WebServer Library:**
   - Implements the web server functionality on the ESP8266, handling incoming HTTP requests and serving web pages.
4. **Servo Library:**
   - Provides functions to control the servo motor, allowing the opening and closing of the pet feeder.
5. **ESP8266HTTPClient Library:**
   - Facilitates making HTTP requests to external systems, in this case, used for fetching the webcam feed.
6. **Web Interface (HTML, CSS, JavaScript):**

- HTML markup for creating the structure of the web pages.
- CSS for styling the web pages and ensuring a user-friendly interface.
- JavaScript for dynamic updates on the web interface and potentially asynchronous communication with the server.

Block Diagram and Explanation:



1. **User Interface (Web Browser):**
    - Users interact with the system through a web browser, accessing the web interface hosted on the ESP8266.
2. **ESP8266 Microcontroller:**
    - The ESP8266 runs the Arduino sketch, managing the core logic of the system.
    - Handles incoming HTTP requests and controls the servo motor and webcam based on user commands.
3. **Servo Motor Control:**
    - The ESP8266 sends signals to the servo motor to control the pet feeder's opening and closing actions.
    - The servo motor physically manipulates the feeder mechanism.
4. **Webcam Control:**
    - The ESP8266 toggles the webcam status based on user commands.
    - If enabled, the webcam captures live video feed for remote monitoring.
5. **Web Interface Generation:**
    - The ESP8266 generates the web interface using HTML, CSS, and JavaScript.
    - The interface displays real-time information about servo and webcam status and allows users to control the pet feeder.
6. **WiFi Connectivity:**
    - The ESP8266 connects to a local WiFi network, enabling communication between the microcontroller and user devices.
7. **Power Supply:**

- Provides the necessary power to the ESP8266, servo motor, and potentially the webcam.

This block diagram illustrates the flow of information and control within the pet feeder system. Users access the web interface, which communicates with the ESP8266 to control the servo, toggle the webcam, and customize feeding intervals. The system enhances user convenience by providing remote access and monitoring capabilities for pet owners.