**Smart water fountains**

Smart water fountains using IoT (Internet of Things) can have various applications, from water conservation to user-friendly features.

**Components Needed:**

Water Fountain: Choose a basic water fountain to modify or build one from scratch.

Microcontroller (e.g., Arduino or Raspberry Pi): This will be the brain of your IoT system.

**Sensors:**

Water Level Sensor: To monitor and manage water levels.

Temperature/Humidity Sensor: To monitor environmental conditions.

Flow Sensor: To measure water flow rates.

**Actuators:**

Pump Control: To control the water flow.

Valves: For regulating water output.

Communication Module (e.g., Wi-Fi or Bluetooth): To connect the system to the internet.

Power Supply: Depending on the location of the fountain, you might need a power source or consider using solar panels.

IoT Platform or Server: To process and store data from the fountain.

User Interface: A web or mobile app for users to interact with the fountain.

**Basic Functionalities:**

Remote Monitoring: Users can check the water level, temperature, and humidity through the app.

Automated Refilling: When the water level drops below a certain threshold, the system can trigger the pump to refill it.

Flow Control: Adjusting the flow rate based on user preferences or environmental conditions.

Alerts and Notifications: Send alerts if there are any issues like low water levels, high temperatures, or malfunctions.

Data Logging and Analytics: Record and analyze data over time for insights into usage patterns and efficiency.

**Optional Enhancements:**

Water Quality Monitoring: Add sensors to check water quality, like pH, turbidity, or contaminants.

Weather Integration: Use weather forecasts to adjust fountain settings, like water flow or shut-off during rain.

User Authentication: Implement user accounts for personalized settings and usage history.

Voice or Gesture Control: Integrate with voice assistants or gesture recognition for hands-free operation.

Water Recycling System: Include a filtration system to recycle water, promoting sustainability.