**SELF FEEDING PLANT**

**Submitted by:**

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**Objective of the project:**

**The main goal of the project is:**

To build a self feeding plant which is self sufficient, and can feed itself with enough water and sunlight.

**Abstract:**

Due to busy day to day life We don’t provide them with enough water and sunlight . this can cause them to die, hence increasing global warming.To over come this, we can introduce self feeding plant. as it provides enough water and makes sure the plants get sufficient sunlight to grow. It is a plant on a mobile cart,finds sunlight and moves towards it on its own for photosynthesis.Enabled with a system that determines soil moisture using soil moisture sensors and waters the plant when needed.

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| Sr no | Components used |
| 1 | Arduino Uno |
| 2 | Arduino IDE |
| 4 | Soil Moisture Sensor |
| 5 | L.D.R Sensor |
| 6 | Water Pump |
| 7 | Servo Motor |

**Description about the requirements:**

**Hardware requirements :**

1. **Arduino Uno**:The **UNO** is the most used and documented board of the whole **Arduino** family. **Arduino Uno** is a micro-controller board based on the ATmega328P (data-sheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs
2. **Soil Moisture Sensors**: measure the volumetric water content in soil.  Its input voltage ranges from 3.3–5V.
3. **L.D.R Sensors:** A photo-resistor (or light-dependent **resistor**, LDR, or photo-conductive cell) is a light-controlled variable resistor. The resistance of a photoresistor decreases with increasing incident light intensity; in other words, it exhibits photo conductivity.
4. **Water Pump:** A pump is a device that moves fluids, or sometimes slurries, by mechanical action.  Its input voltage is 12v so we require a relay as the maximum output of arduino uno is 5v so relay connected with a external battery will help the water pump to get required voltage.
5. **Servo Motor**: is a closed-loop system that uses position feedback to control its motion and final position. Its input voltages ranges from 3~12v.

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**Software Requirements:**

1. **Arduino IDE :**  IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board .

**Working Of the Project:**

The working of the project is as followed, the first sensor is the L.D.R sensor connected on both front and back of the mobile cart, it senses the intensity of sunlight and moves in the direction of intensity of sunlight. when both the L.D.R. sensors senses no sunlight it assumes that its night time and doesn't move. And the second sensor is Soil Moisture Sensor which is placed near the roots of the plants in the soil. It detects the moisture in the soil and if the moisture is less the water motor gets turn on, it continues to sense the moisture and water pump stops when there is sufficient moisture.

**Flow diagram:**

Water Pump

Arduino Uno

Soil moisture Sensor sensor

Servo Motor

L.D.R sensor

**PROJECT CODE :**

//Motors

#define motorR1 10 // Assigning Right motor pin1 to digitalpin 10 of arduino

#define motorR2 11 // Assigning Right motor pin2 to digitalpin 11 of arduino

#define motorL1 12 // Assigning Left motor pin1 to digitalpin 12 of arduino

#define motorL2 13 // Assigning Left motor pin2 to digitalpin 13 of arduino

#define waterpump 8 // Assigning water pumping motor to digitalpin 8 of arduino

// Sensors

#define SensorLDR1 7 // Assigning LDR sensor1 to digitalpin7 of arduino

#define SensorLDR2 6 // Assigning LDR sensor2 to digitalpin6 of arduino

#define SensorMOISTURE 5 // Assigning Humidity sensor to digitalpin5 of arduino

void setup() {

//SerialInit

Serial.begin(9600);

// OutPut Pins

pinMode(motorR1 , OUTPUT);

pinMode(motorR2, OUTPUT);

pinMode(motorL1, OUTPUT);

pinMode(motorL2, OUTPUT);

pinMode(waterpump, OUTPUT);

//InputPins

pinMode(SensorLDR1 , INPUT\_PULLUP);

pinMode(SensorLDR2 , INPUT\_PULLUP);

pinMode(SensorMOISTURE, INPUT\_PULLUP);

}

void loop() {

Serial.print("Robot is not moving...\r\n");

digitalWrite(motorR1, LOW); digitalWrite(motorR2, LOW);

digitalWrite(motorL1, LOW); digitalWrite(motorL2, LOW);

digitalWrite(waterpump, LOW); // Water pump is in OFF state

if(digitalRead(SensorLDR1) == HIGH && digitalRead(SensorLDR2) == LOW )

{

Serial.print("Sun light is Detected by LDR1...Robot is moving towards LDR1\r\n");

digitalWrite(motorR1, HIGH); digitalWrite(motorR2, LOW);

digitalWrite(motorL1, HIGH); digitalWrite(motorL2, LOW);

while(digitalRead(SensorLDR2) == HIGH);

Serial.print("Sun light is Detected by both sensors.. Robot stops moving\r\n");

}

if(digitalRead(SensorLDR1) == LOW && digitalRead(SensorLDR2) == HIGH )

{

Serial.print("Sun light is Detected by LDR2.. Robot is moving towards LDR2 \r\n");

digitalWrite(motorR1, LOW); digitalWrite(motorR2, HIGH);

digitalWrite(motorL1, LOW); digitalWrite(motorL2, HIGH);

while(digitalRead(SensorLDR1) == HIGH);

Serial.print("Sun light is Detected by both sensors.. Robot stops moving\r\n");

}

if(digitalRead(SensorMOISTURE) == LOW)

{

Serial.print("LOW Moisture content in Soil \r\n");

digitalWrite(waterpump, HIGH);

Serial.print("Water Pump is serving the water \r\n");

delay(2000);

digitalWrite(waterpump, LOW);

Serial.print("Water Pump is is in OFF state \r\n");

}

}}

}

**Advantages of the Project:**

1. We dont need worry about the plants as they are self sufficient and can grow with enough water and sunlight.
2. Will help the plants to grow hence, reducing carbon dioxide levels and certain pollutants, such as benzene and nitrogen dioxide.
3. Reducing Global Warming and Keeping air temperatures down.

**Future scope:**

1. The signs of global warming are everywhere, and are more complex than just climbing temperatures, hence if we grow plants and trees as much as we can, we can help stop global warming in future.
2. In future more people will move from a rural to an urban area mostly because of economic and employment reasons so more area will develop from rural to urban causing decrease in plants so we can adapt this project as it is made for people in urban area.