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**18/eng03/001**  
**Civil engineering**

```
#include "dht.h"  
#define dht_apin A0 // Analog Pin sensor is connected to  
  
dht DHT;  
int temp;  
int hum;  
//soil Moisture  
int soilPin=A2;  
int soilValue = 0;  
int soilout=8;  
//light  
int fireSensor = 4;  
int lightout=10;  
int light_detected;  
//water  
const int waterSens = A1;  
int waterVal;  
int waterled=11;  
//fire  
int light2_sensor = 3 ;  
int flame_detected;  
int pump = 12 ;  
int Heater=9;  
void setup() {  
  Serial.begin (9600);  
  pinMode(fireSensor, INPUT);  
  pinMode(waterSens, INPUT);
```

```
pinMode(lightout, OUTPUT);  
pinMode(pump, OUTPUT);  
pinMode(light2_sensor, INPUT);  
pinMode(soilPin, INPUT);  
pinMode(soilout, OUTPUT);  
pinMode(Heater, OUTPUT);  
pinMode(waterled, OUTPUT);  
pinMode(waterSens, INPUT);  
}
```

```
void loop() {  
  //c# commends
```

```
  char data=Serial.read();
```

```
  switch(data)
```

```
  {
```

```
    //pump//
```

```
    case 'G':digitalWrite(soilout, LOW);
```

```
    break;
```

```
    case 'g':digitalWrite(soilout, HIGH);
```

```
    break;
```

```
    //heater//
```

```
    case 'H':digitalWrite(Heater,LOW);
```

```
    break;
```



```
case 'h':digitalWrite(Heater,HIGH);  
break;
```

```
    }  
    //Temp//  
    DHT.read11(dht_apin);  
  
    Serial.print("V:");  
    temp=DHT.temperature;  
    Serial.print(temp);
```

```
    Serial.print("V:");  
    hum=DHT.humidity;  
    Serial.print(hum);
```

```
    //Soil Moisture  
    soilValue =analogRead(soilPin);  
    soilValue=(1024-soilValue)/10;  
    Serial.print("V:");  
    Serial.print(soilValue);
```

```
    //water  
    waterVal = analogRead(A1);  
    waterVal=waterVal/10;  
    Serial.print("V:");  
    Serial.print(waterVal);  
    if (waterVal <= 20){  
    digitalWrite(waterled ,LOW);}  
}
```



```
else{
  digitalWrite(waterled,HIGH);
}

//light
light_detected = digitalRead(light2_sensor);

if (light_detected == 1)
{

  digitalWrite(lightout, LOW);

}
else
{
  digitalWrite(lightout, HIGH);
}

//fire
flame_detected = digitalRead(fireSensor);
Serial.print("V:");
Serial.print(flame_detected);
Serial.println("V:");
if (flame_detected == 1)
{

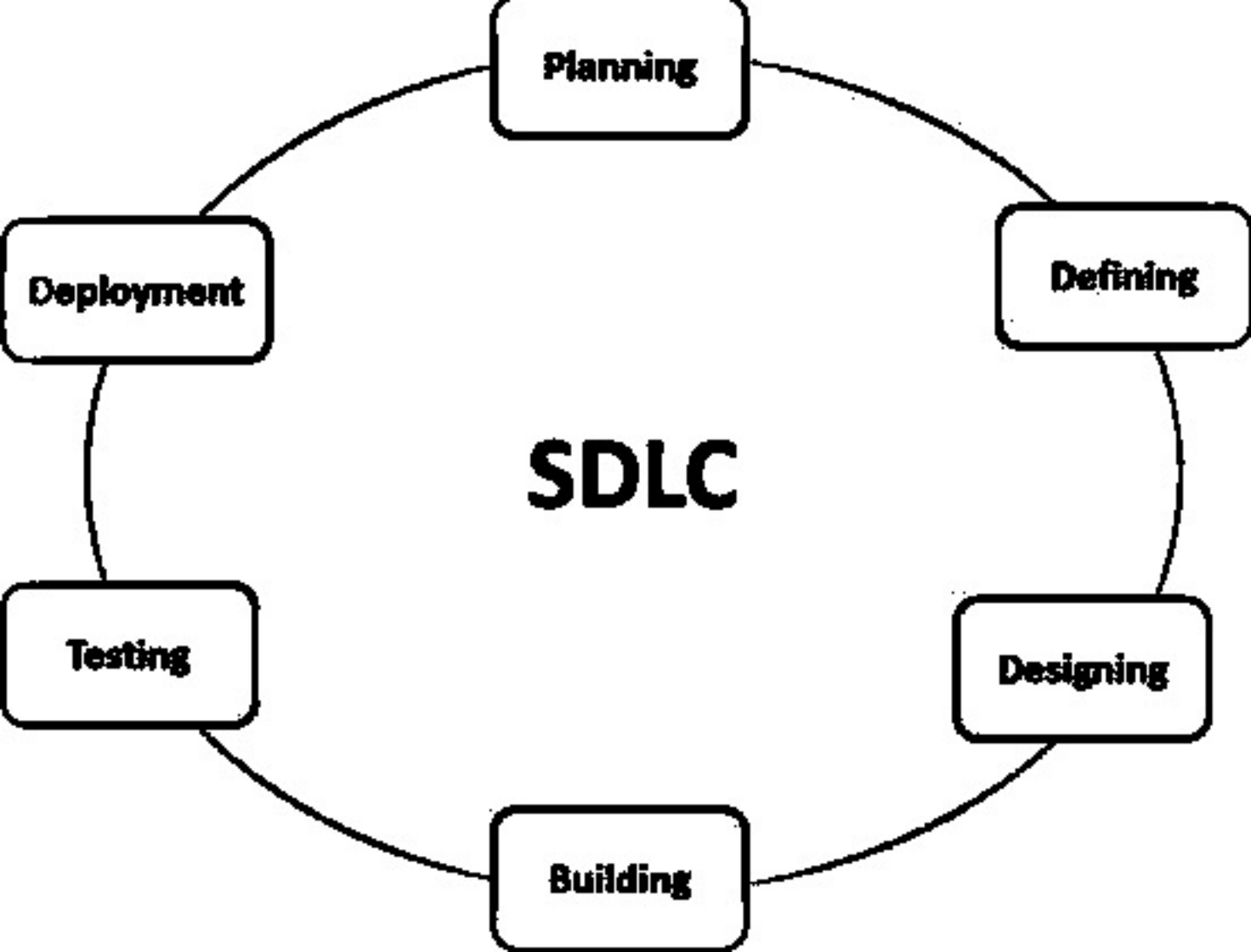
  digitalWrite(pump, LOW);

}
else
{

  digitalWrite(pump, HIGH);
}

delay(100);
}
```

---



**Planning**

**Defining**

**SDLC**

**Designing**

**Building**

**Testing**

**Deployment**

**PLANNING:** In planning the application the application must be able to agree with the terms and conditions like it should be able to read the temperature of the soil. etc.

**DESIGN:** In designing the application it will need both input and output layout with some processed steps. A design approach clearly defines all the architectural modules of the product along with its communication and data flow representation.

**IMPLEMENTATION:** Implementation represents the work (coding) that is done to meet the requirements of the scope of work and also the

**realization of a technical specification and the realization of a technical program with the help of programming. The coding application will ensure that the application will be able to determine the moisture content of the soil. It will also have a sensor that will trigger it when there is not water and also a password setting to out the password.**

**TESTING-** The application that is being developed will be tested so that there will be no logical and syntax errors. So these errors are checked by using the test data and debugging tools

**MAINTENANCE:** This part involves how the application is going to be maintained in order for it to be functioning properly. It can be maintained by checking the application for viruses and installing software updates.

**RELEASE:** The release is the final version of an application. A software is being released so that it can perform its functions.

## **B. The Software and hardware used**

**The programming language that will be used will be javascript. Javascript is a very complex programming language but very powerful for application development. It is a dynamic programming language meaning that the codes can be changed if the developer wants to change it. It has a powerful frame work which is NODE.js will makes the application to be developed easily and less coding. The name of the application will be ABUAD FARM APP. In the aspect of the sensors a programming language python will be there to able its functionality. The hardware used are A sensor detector that will be able to trigger the alarm when there is no water. A temperature scale to read the temperature of the soil. A Time for time interval.**

## The Flowchart

