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MAT NO: 19/ENG05/072

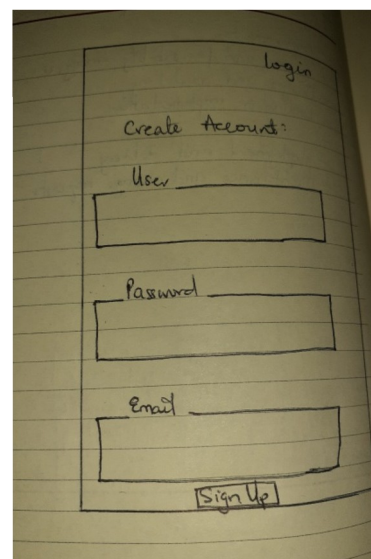
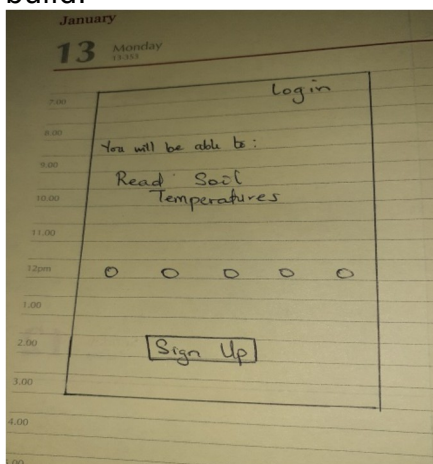
DEPT: MECHATRONICS

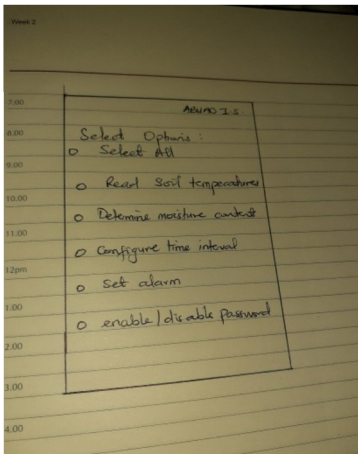
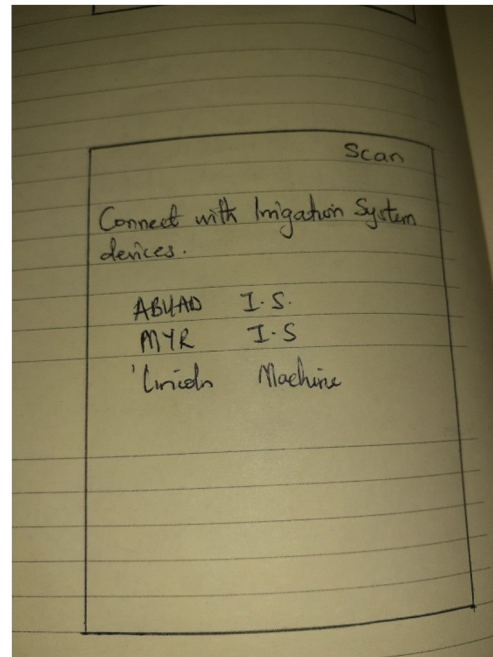
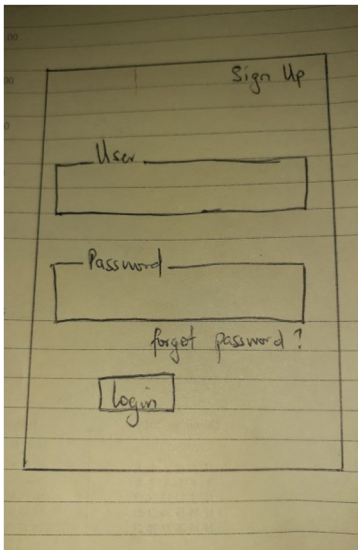
COURSE CODE: ENG 224

COURSE: COMPUTER PROGRAMMING

The development of the irrigation software is as follows:

1. **PLANNING:** The main objective of this project is to develop an irrigation software that solves most problems related to irrigation and agriculture. This software should be able to read soil temperature, determine moisture content, analyze crops, configure time interval, set alarm and enable or disable password.
2. **REQUIREMENTS:** In order to design the software appropriately and efficiently, there are some requirements that are to be met. This requires many different sensors (temperature, moisture, water level and light). Other devices are needed like LCD Screen, to monitor water flow, battery and connecting wires.
3. **DESIGN AND PROTOTYPING:** The basic idea is to rely on the type of soil and the amount of water needed by each type of soil. This process is done by measuring the level of moisture in each type and using the pump to supply water. The result indicates that sandy soil requires less water than clay soils. This device is to focus on soil moisture and water conservation but making the machine much less powerful is to measure the moisture of soil from one location in the agricultural land, which can be controlled remotely through the software. The first thing will be designing the wireframes of the software, which is like the skeleton of the software, then test them, after that, choosing the platform and appropriate programming language comes next and then build.





(WIREFRAMES)

4. **SOFTWARE DEVELOPMENT:** The software will be able to get data from the sensors installed in the soil and analyze them, it will be able to read the temperatures and perform other functions. The software will also be able to time the irrigation process and set an alarm for when irrigation is needed using the data obtained from the sensors.
5. **TESTING:** Before build, all devices used are tested to ensure proper functionality. All sensors and tools are tested individually before being connected together and then being tested as one unit. Each compartment is tested one by one; the controllers, the sensors and the connectors and then the whole system.

6. DEPLOYMENT: This is basically releasing the software to the public and the processes involved, that is, legal processes, approval etc.
7. OPERATION AND MAINTENANCE: The software will be monitored constantly and consistently. Bugs and defects discovered during production or launch or use, are reported and responded to. The bug fixes may not flow through to the entire cycle; however, it is necessary to ensure that the fixes do not cause more problems.

HARDWARE FEATURES:

Breadboard: Breadboard is a plastic board for holding wires and electronic segments such as transistors and resistors

Moisture Sensor: The soil moisture sensor tests permit the current to pass through the soil, which gives the resistance estimate to the degree of the dampness estimate. When there is water in the soil there will be less resistance and the soil will handle more power. But if the soil is dry it conduct power weekly and needs less power and more resistance.

Temperature Sensor: A temperature sensor is sensor to measure the ambient temperature.

Light Sensor: A Light Sensor is a gadget that recognizes light. A light sensor measures the brilliant vitality display in the wide run of frequencies in the light range. A few of the common frequencies are infrared, obvious and bright.

Level Sensor: The water-level pointer is utilized to demonstrate the water level in the tank, by using this sensor we can control the flood of the water as well know the level of the water in the tank , and at any time we can adjust the water level and water flow.

Water Pump: It has good advantages. Such as, it has a lightweight. Also, it has a small size, so it is easy to install and replace it. Furthermore, it has an enough efficiency to pump water for irrigation. Since it operates using 12 volts, it consumes lower power. In addition, this pump has a very Low of noise. Finally, the cost of this pump is very cheap.

Battery: This battery is a high-quality battery that is designed in order to give top performance, strength and long life.

SOFTWARE FEATURES:

InVision is a software tool that allows programmers to create prototype software with the use of graphical interface.

Bluetooth is used to connect the software to the corresponding system to record and analyze data. When the Bluetooth is connected, the text reads 'connected' and

turns green but when it is not, it reads 'not connected' and turns red. This can be achieved with the use of visual basic studio.

Clock is used to set the alarm for irrigation and to also time the irrigation process

Record is used to record the already analyzed data in graph form

ON/OFF button is used to remotely switch off or switch on the system remotely.

ALGORITHM, TOP-DOWN APPROACH AND FLOWCHART:

1. Start
2. Load startup screen
3. If (signup is clicked) then go to signup screen else go to login screen
4. Load signup/login screen
5. Verify all entries
6. Load Bluetooth screen
7. Connect to required device
8. Load options
9. If (select all is chosen) then perform all activities else perform selected activities
10. If (soil moisture is low) then irrigate
11. If (temperature < 40°C) then irrigate
12. End

