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LEVEL: 200

MATRIC NO: 18/ENG03/012

A.

1. **CONCEPTUALIZATION**: Software

2. **SPECIFICATION**:

<u>HARDWARE</u>	<u>SOFTWARE</u>
a. Thermometer	a. Text box
b. Moisture meter	b. Command box
c. Security token	
d. NEST water leak sensor	
e. Timer	

3. **DESIGN**:
Using an algorithm:
1. Start
2. Read the code to create password
3. Read the code for temperature in farad
4. Read the code to determine the moisture content in percentage
5. Read the code to configure time interval for the water system in seconds
6. Read code to trigger an alarm for no sufficient water
7. Enter password
8. If the temperature is between 65 to 75F
    Print planting season
9. If the time interval is set
    Print watering
10. If the trigger alarm is set
    Print no sufficient water
11. Stop

4**) Implementation:**

This process involves using algorithm or flowchart to create codes

AN ALGORITHM TO CREATE PASSWORD

1. Start
2. Let integer password be x
3. X=10, while x!=0
4. Print input the password
5. Standard input stream(%d, and password)
   If password=8514
   Print correct password
   Else
   Print wrong password, try again
6. Stop

b. AN ALGORITHM ON HOW TO READ THE TEMPERATURE OFA SOIL

1. Start

2. Read temperature in Fahrenheit

3. C= (5(F-32)/9

4. Print C

5. Stop

c. AN ALGORITHM ON HOW TO DETERMINE MOISTURE CONTENT

1. Start

` 2. Moisture content =0

3. Read W1, W2 and W3

4. Let W1 be weight of container with lid

5. Let W2 be weight of container with lid and sample before drying

6. Let W3 be weight of container with lid and sample after drying

7. Moisture content= (W2-W3/W2-W1) * 100

8. Print moisture content

8. Stop

TESTING AND DEBUGGING:

This process involve checking if it will work and locating errors.

RELEASE AND UPDATE:

This software is going to be released on 23rd of June 2020 and be updated base on the customer or user feedback.

B

HARDWARE

Thermometer:

Thermometer is a devices that measure temperature. Measuring the temperature of the soil is a significant factor especially in agriculture and land treatment. Some of the thermometers normally used in soil work include mercury or liquid in glass, bimetallic bourdon and electrical-resistance thermometers. The temperature of the soil is influenced by solar radiation, daily and monthly fluctuations of air temperature

Moisture meter:

Moisture meter is used to measure the percentage of water in the soil. It can measure the moisture content of everything from the air (relative humidity} to the soil

Security token:

A security token is a peripheral device used to gain access to an electronically restricted resources. The token is used in addition to or in place of password.

NEST water leak sensor:

This is use to deter anything. For the soil, it is use to trigger alarm

Timer:

Timer is used to control the sequence of event while counting in fixed intervals of time. For soil it is use to produce precise time delay.

SOFTWARE

1. **Label box**: This box is use to provide output on the machine

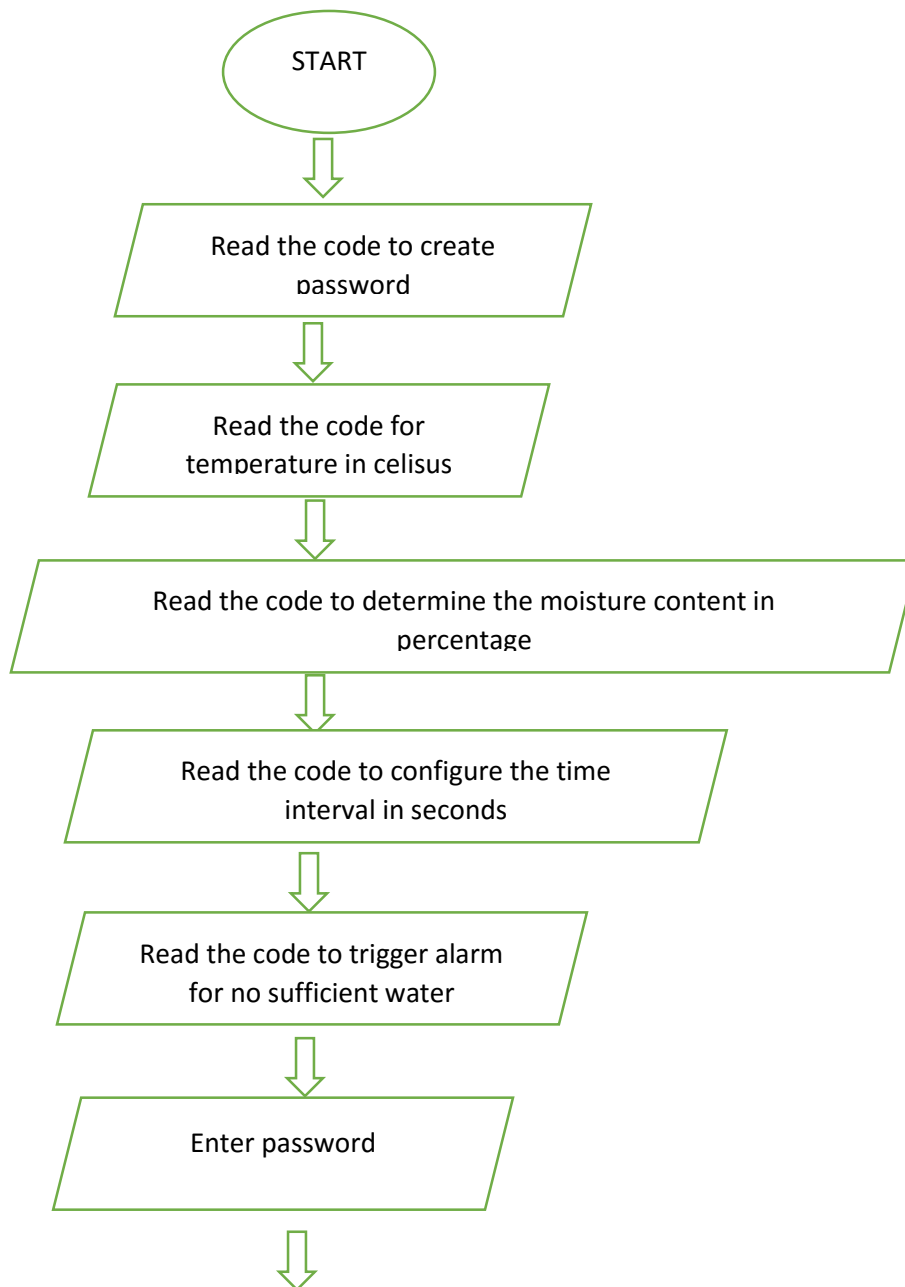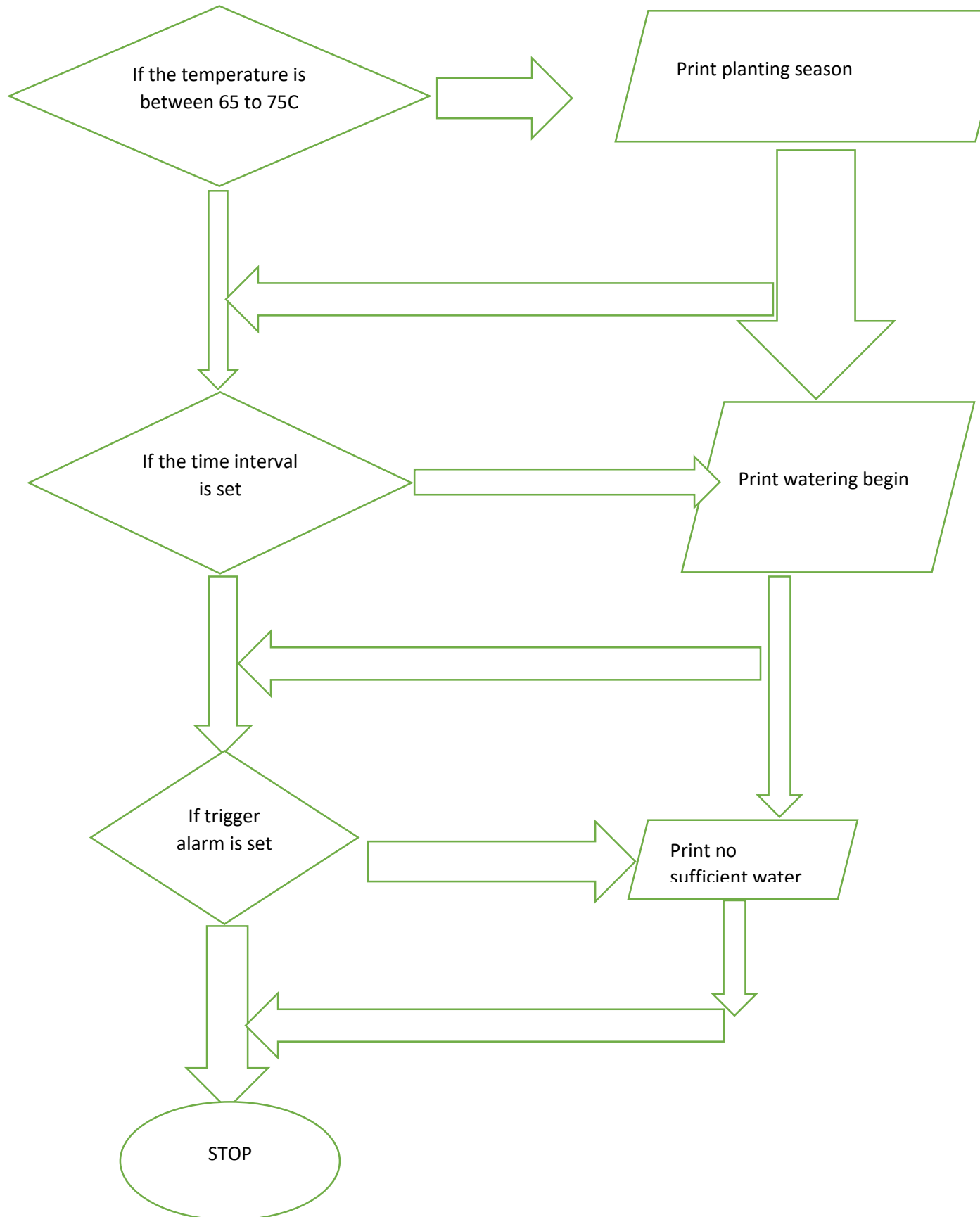2. **Command box** : this box is use to perform command

C

ALGORITHM
1. Start
2. Read the code to create password
3. Read the code for temperature in farad
4. Read the code to determine the moisture content in percentage
5. Read the code to configure time interval for the water system in seconds
6. Read code to trigger an alarm for no sufficient water

7. Enter password
8. If the temperature is between 65 to 75F
   Print planting season
9. If the time interval is set
   Print watering
10. If the trigger alarm is set
    Print no sufficient water
11. Stop

FLOWCHART

START

Read the code to create password

Read the code for temperature in celisus

Read the code to determine the moisture content in percentage

Read the code to configure the time interval in seconds

Read the code to trigger alarm for no sufficient water
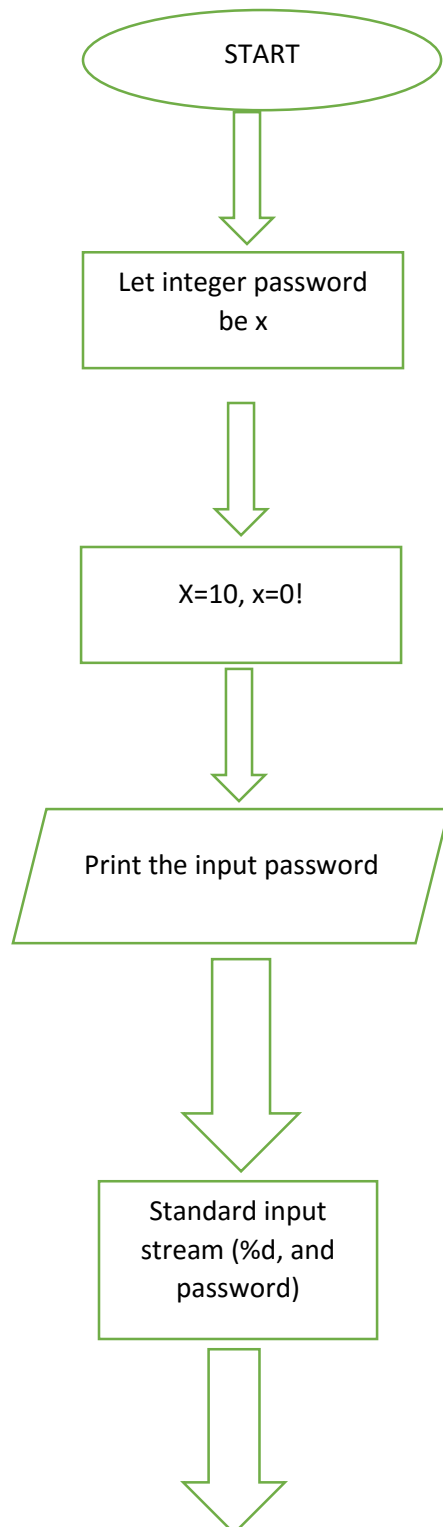
Enter password

If the temperature is between 65 to 75C

Print planting season

If the time interval is set

Print watering begin
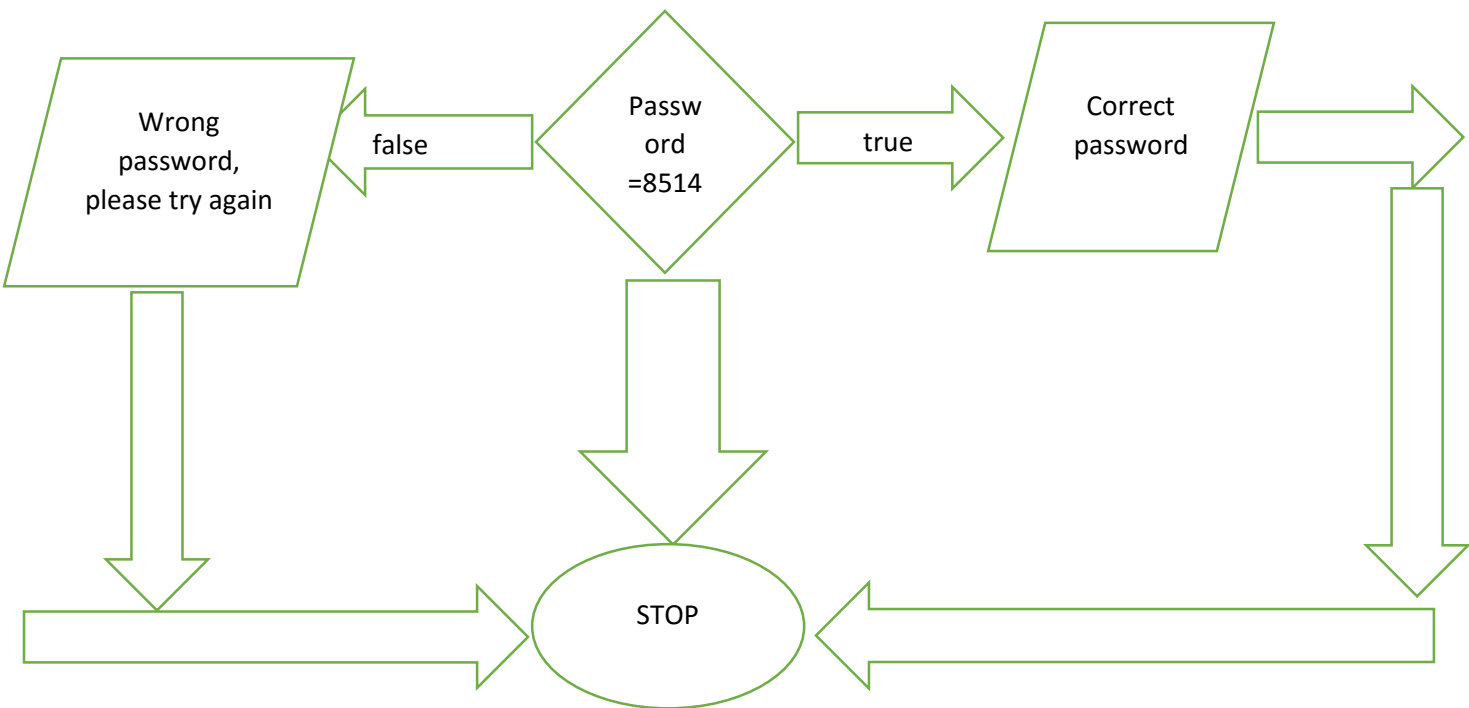
If trigger alarm is set

Print no sufficient water

STOP

SECOND FLOWCHART TO CREATE PASSWORD

START

Let integer password be x

X=10, x=0!

Print the input password

Standard input stream (%d, and password)

```
                    ┌─────────┐                      ┌─────────┐
  ╱ Wrong    ╲      │ Passw   │      ┌─────┐         ╱ Correct  ╲
 ╱ password,  ╲ ◄── │  ord    │ ──►  │true │ ──►    ╱ password   ╲ ──►
╱ please try   ╲    │ =8514   │      └─────┘        ╲            ╱
╲  again       ╱    └────┬────┘                      ╲          ╱
 ╲            ╱          │
  ╲          ╱           │
      │                  ▼
      │              ┌───────┐
      ▼              │ STOP  │ ◄──
                     └───────┘
```

false   **true**

Wrong password, please try again

Password =8514

Correct password

STOP

FLOWCHART TO READ THE TEMPERATURE

START

READ TEMPERATURE IN FARHENEIT

$$C = (5(F-32)/9$$
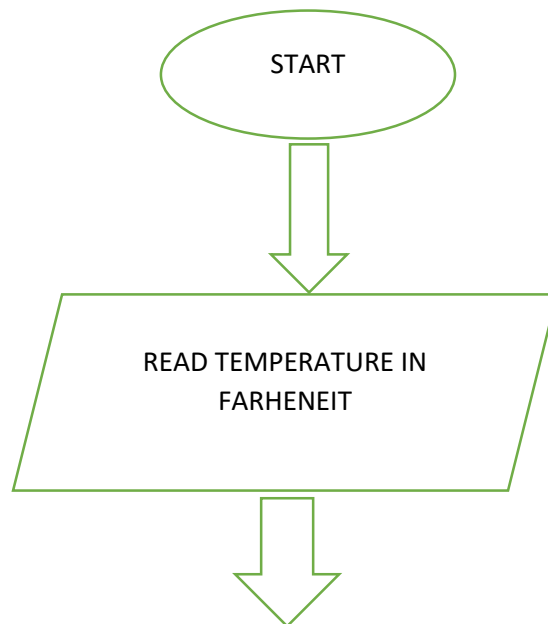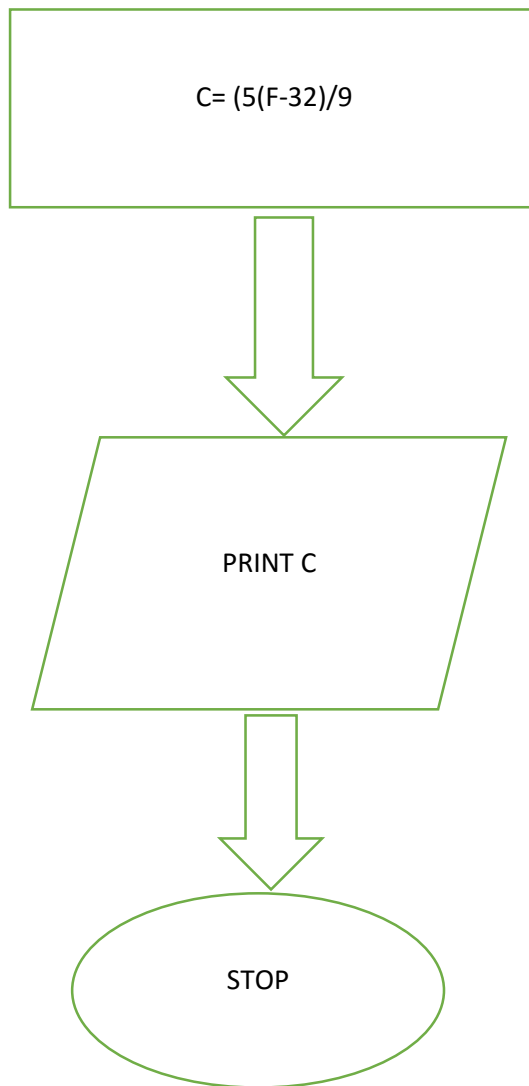
PRINT C

STOP

FLOWCHART TO DETERMINE THE MOISTURE CONTENT

START

MOISTURE CONTENT=0

```
          │
          ▼
    ╱─────────────╲
   ╱  READ W1, W2  ╲
  ╱    AND W3       ╲
 ╱_____╲
          │
          ▼
┌─────────────────────┐
│  LET W1 BE WEIGHT OF │
│  THE CONTAINER WITH  │
│         LID          │
└─────────────────────┘
          │
          ▼
┌─────────────────────────┐
│  LET W2 BE WEIGHT OF THE │
│  CONTAINER WITH LID AND  │
│ THE SAMPLE BEFORE DRYING │
└─────────────────────────┘
          │
          ▼
┌─────────────────────────┐
│  LET W3 BE WEIGHT OF THE │
│ CONTAINER WITH LID AND THE│
│   SAMPLE AFTER DRYING    │
└─────────────────────────┘
          │
          ▼
```
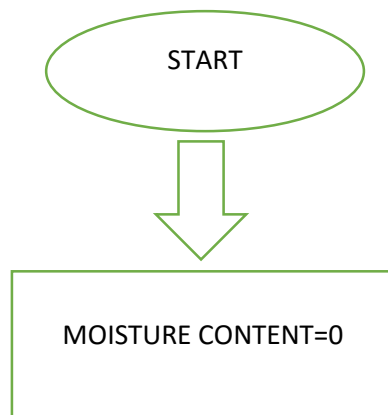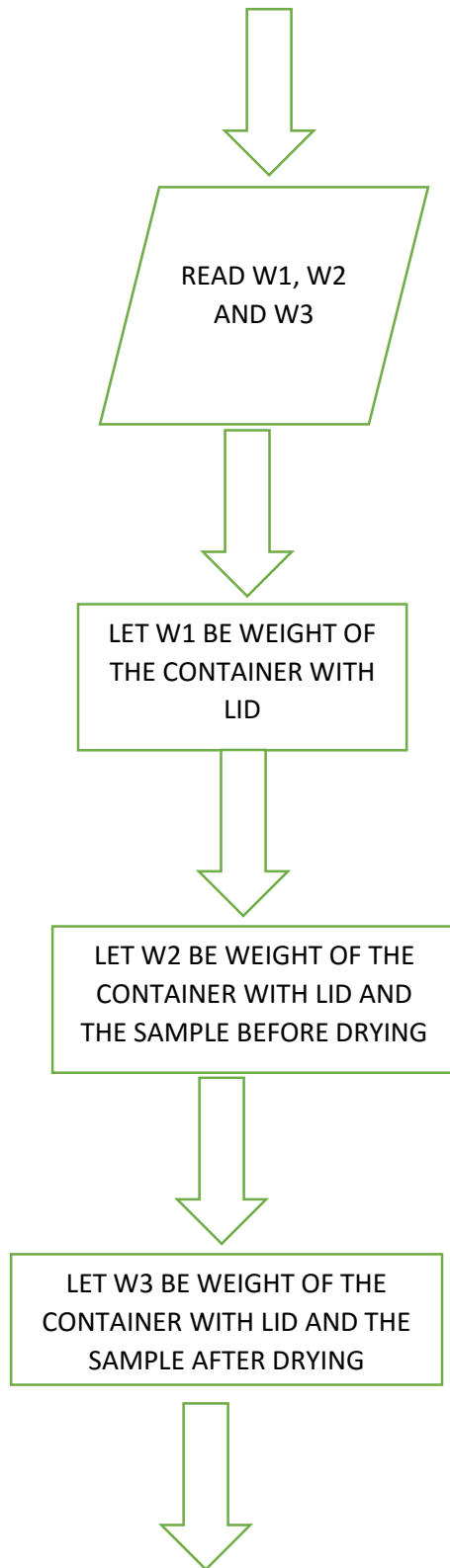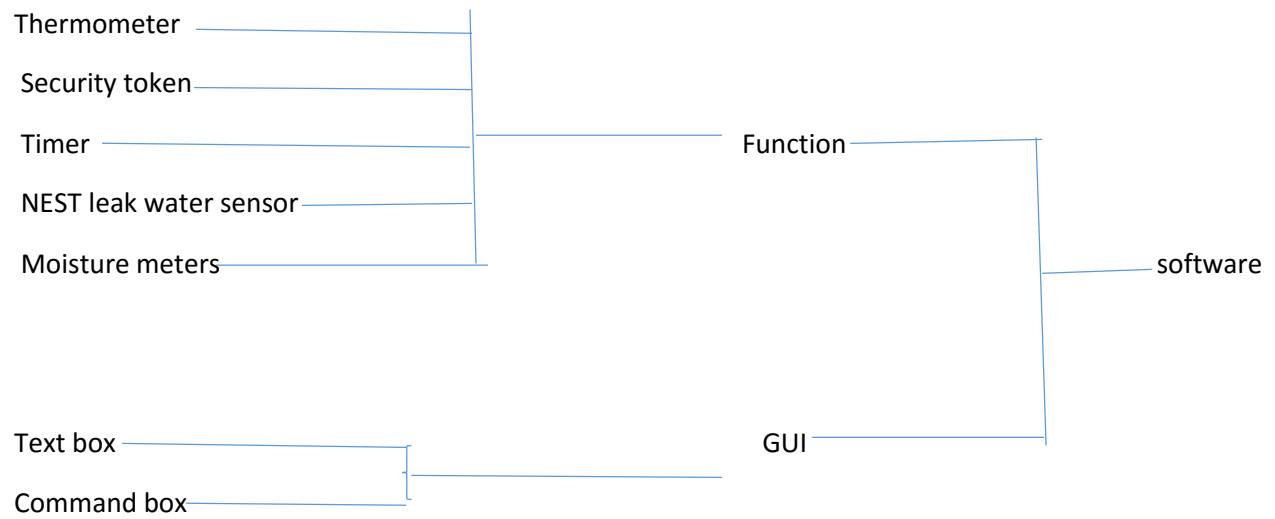
MOISTURE CONTENT = (W2-W3/W2-W1)*100

PRINT MOISTURE CONTENT

STOP

Thermometer ─────────┐
Security token────────┤
Timer ───────────────┤──────────── Function ────────┐
NEST leak water sensor──┤   │
Moisture meters─────────┘   ├──── software
                                                       │
                                                       │
Text box ──────────┐   │
                   ├──────────── GUI ─────────────────┘
Command box────────┘

BOTTOM –UP APPROACH