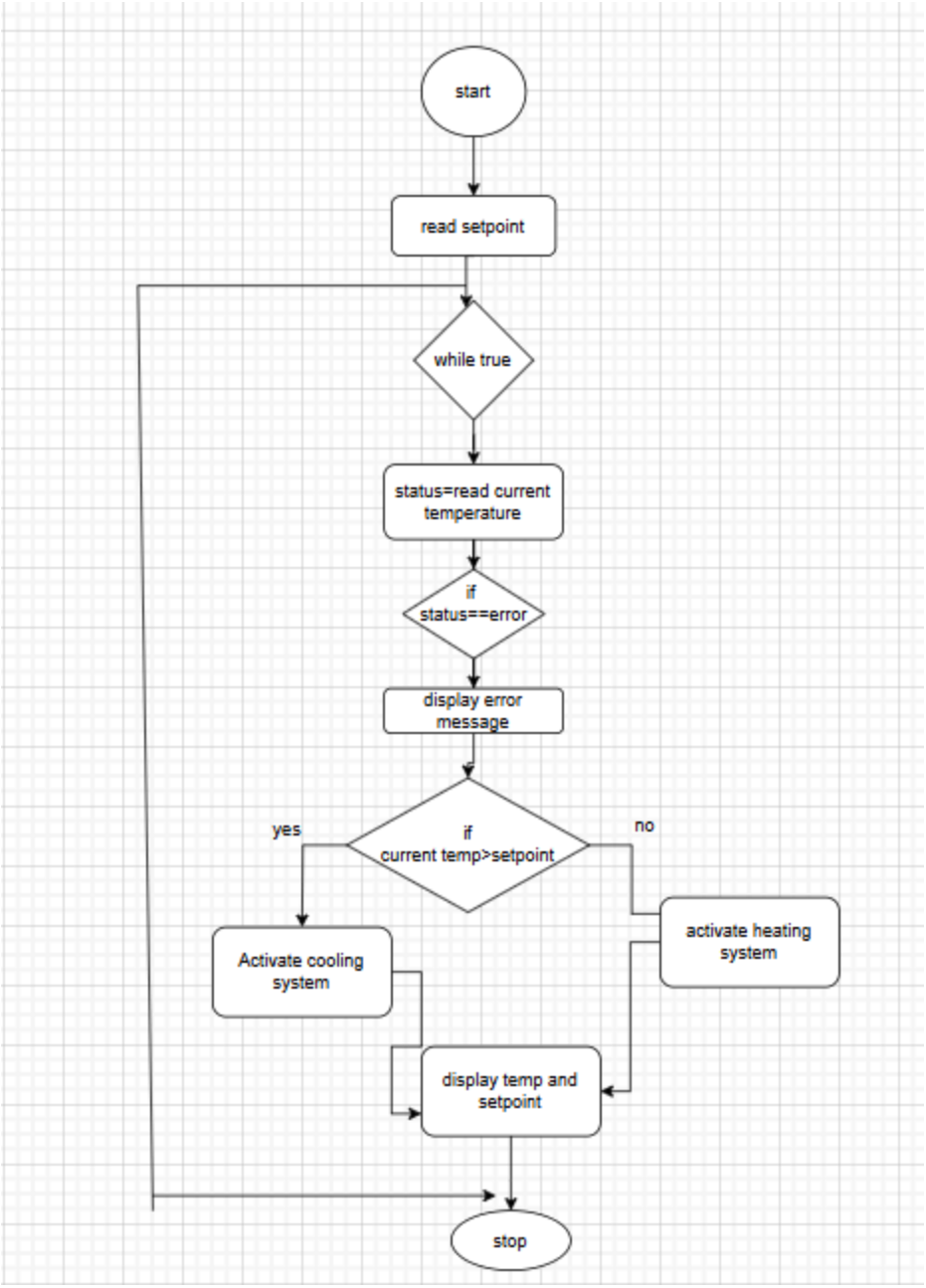
Write the Pseudocode and Flowchart for the problem statements mentioned below:

1. Smart Home Temperature Control

Psuedocode

Enter setpoint

while(True):
status=current temperature
if(status==error)
Display error message in lcd Continue next iteration
 If current temp>setpoint
        THEN Activate cooling system
ELSE
Activate heating system
Display current temp and setpoint



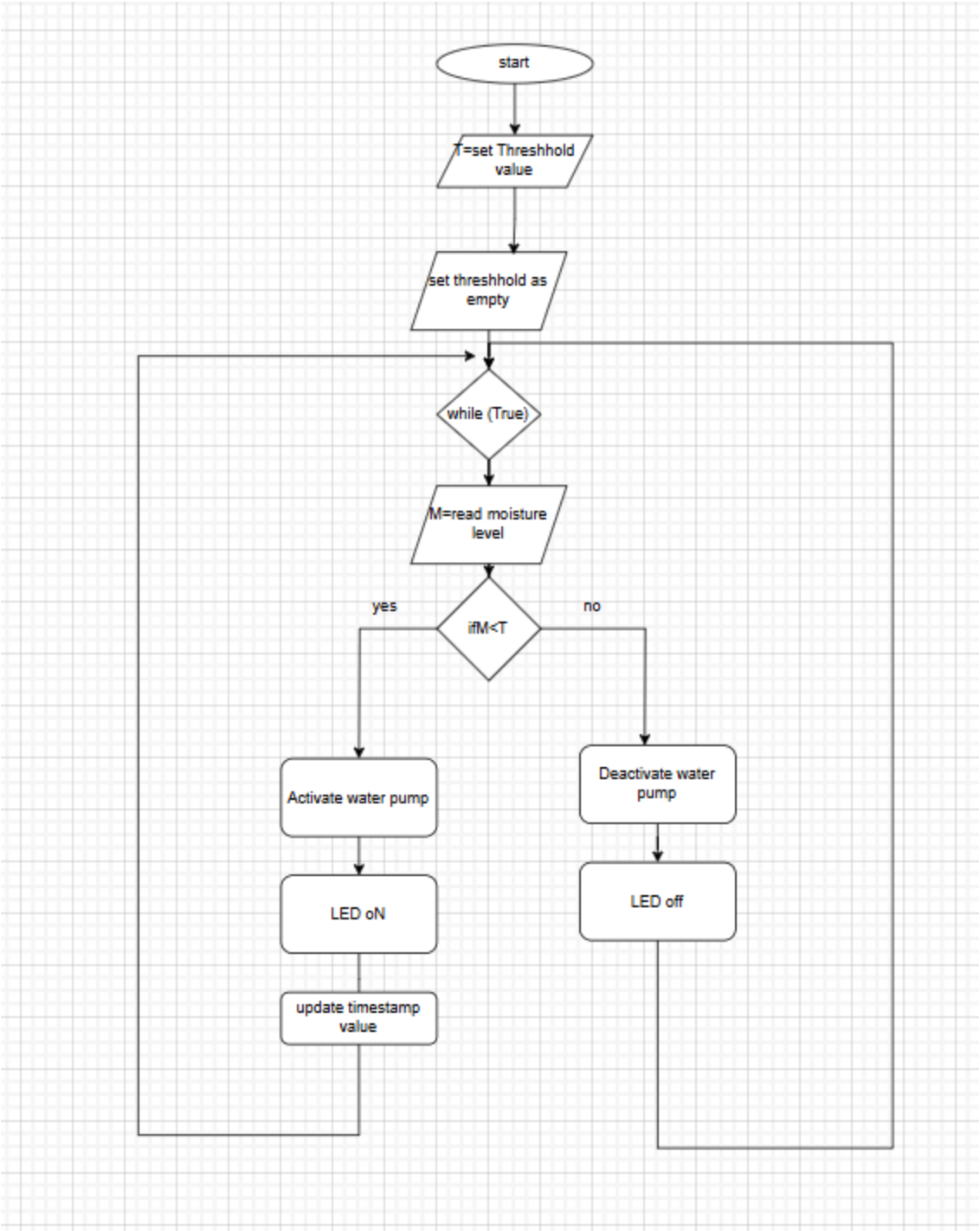
2. Automated Plant Watering System

Psuedocode

Set threshold value (T)
Initialize timestamp as empty

Loop forever:
    Wait for one hour
    M = Read soil moisture level

```
    If M < T then
        Activate water pump
        Turn ON LED
        Update timestamp with current time
    Else
        Deactivate water pump
        Turn OFF LED
    End If
End Loop
```



3. Motion Detection Alarm System

START
  Set motion_detect_duration = 5 seconds
  Set timer = 0

REPEAT:

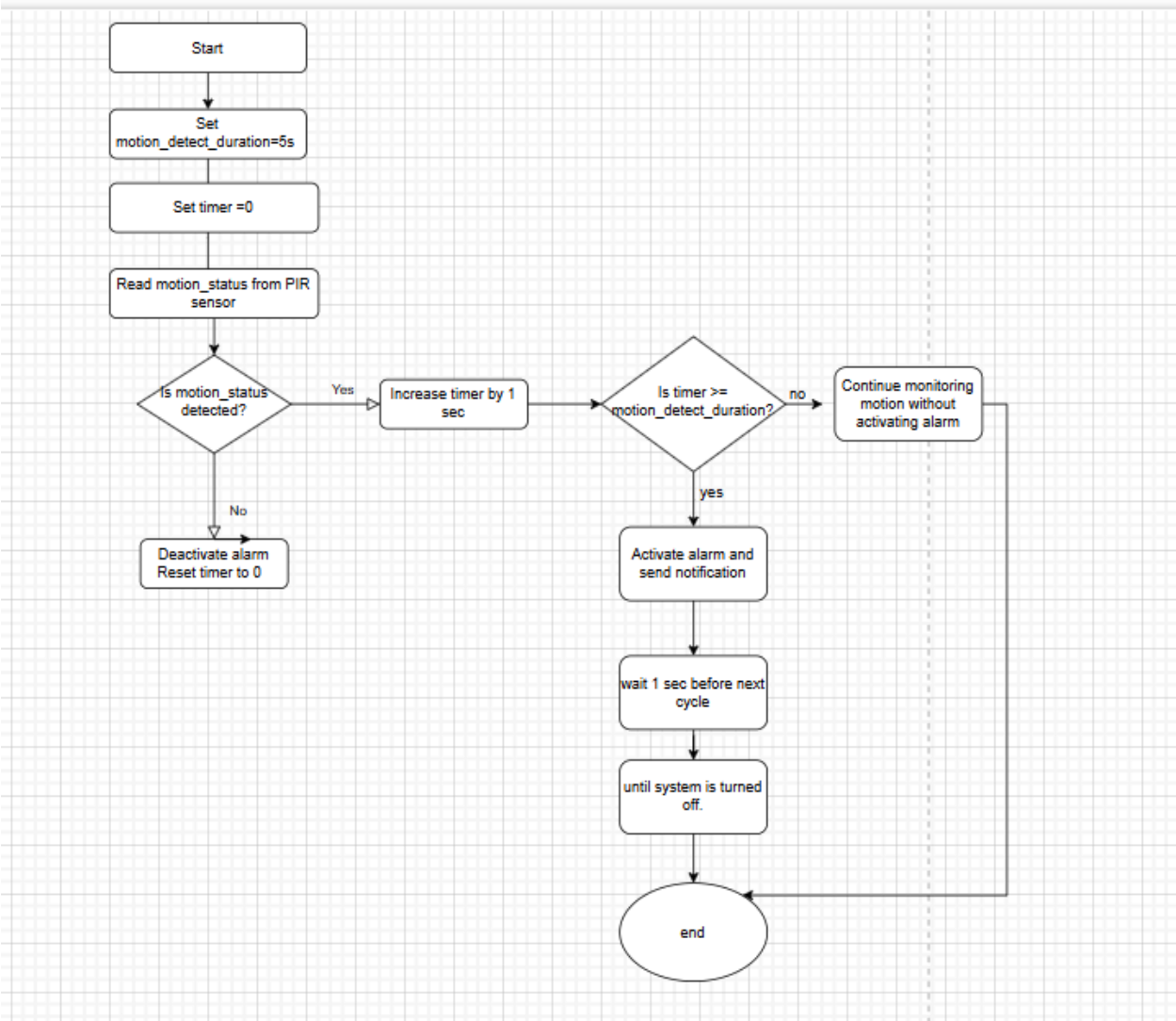
1. Read motion_status from PIR sensor

2. If motion_status is "detected" then:
   a. Increase timer by 1 second
   b. If timer >= motion_detect_duration then:
      - Activate alarm
      - Send notification to mobile device via UART communication
   c. Else:
      - Continue monitoring without activating alarm

3. If motion_status is "not_detected" then:
   a. Deactivate alarm
   b. Reset timer to 0

4. Wait 1 second before repeating the cycle

UNTIL (System is turned off)



4. Heart Rate Monitor

Set threshold (T) = 100 beats/min

while (TRUE):
From i 1 to 60

arr[i] = store each value in array
initialize sum = 0

sum = sum + arr[i]

End the for loop

average = sum / 60

if (average > T):

Activate alarm

Else:

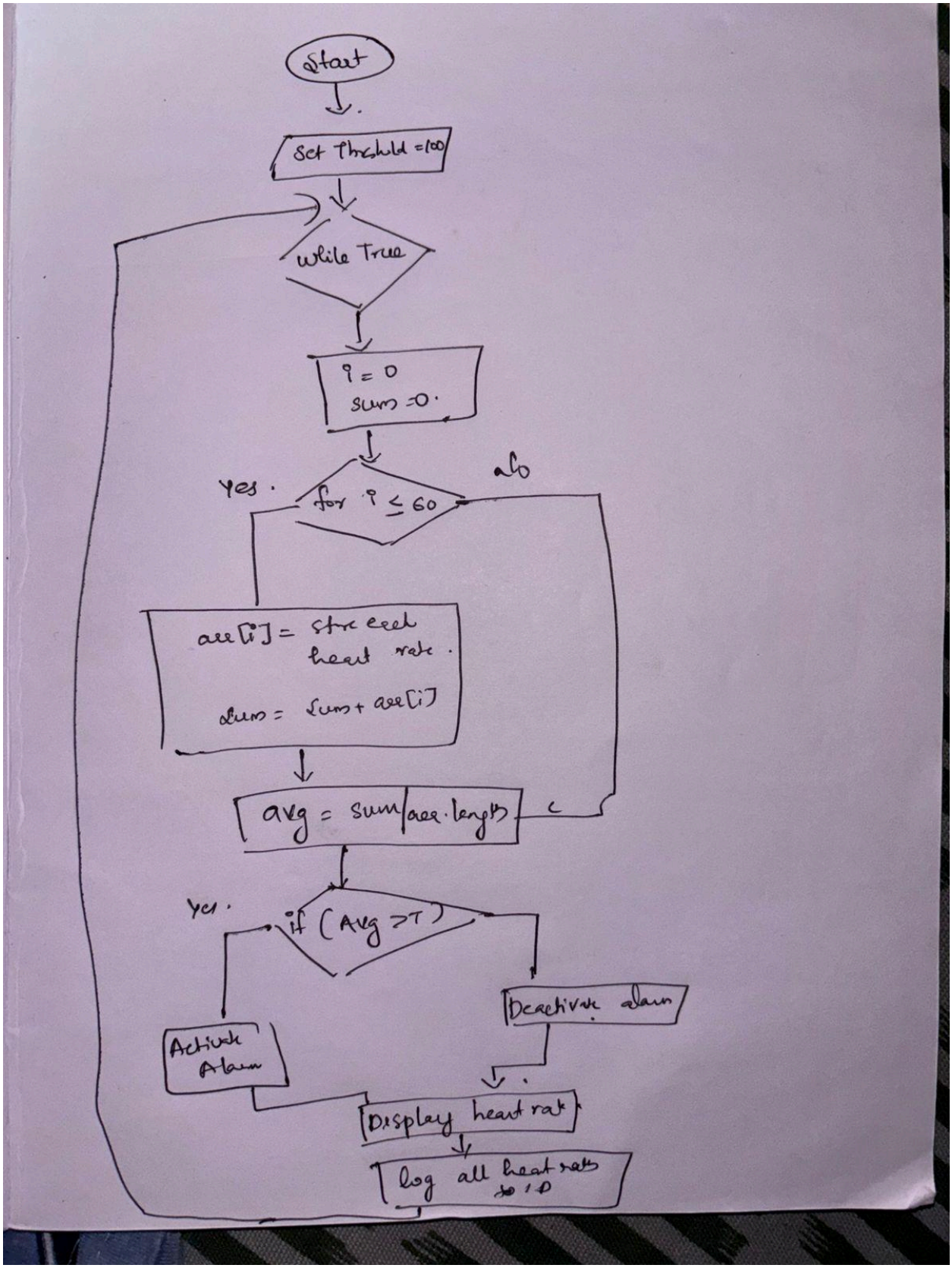
Deactivate alarm

Endif

Display current heart rate (arr[60]) and average heart rate on LCD

Log current heart rate and average heart rate to SD Card

End while


Start
Set Threshold =100
While True
i = 0
sum = 0.
Yes.
for i ≤ 60
ave[i] = store each heart rate.
sum = sum + ave[i]
avg = sum/ave.length
if (Avg > T)
Yes.
Activate Alarm
Deactivate alarm
Display heart rate
log all heart rates to DB

5. LED Control Based on Light Sensor

Set threshold value(T)

while(true):

M=Enter mode(manual/auto)

IF(M==manual) THEN INintensity is low) THEN

LED ON

ELSE

LED OFF

ENDIF

Blink feedback LED to indicate manual mode is active

ELSE

I=Read light intensity at every minute by sensor

IF(I<T) THEN

Turn on LED

ELSE

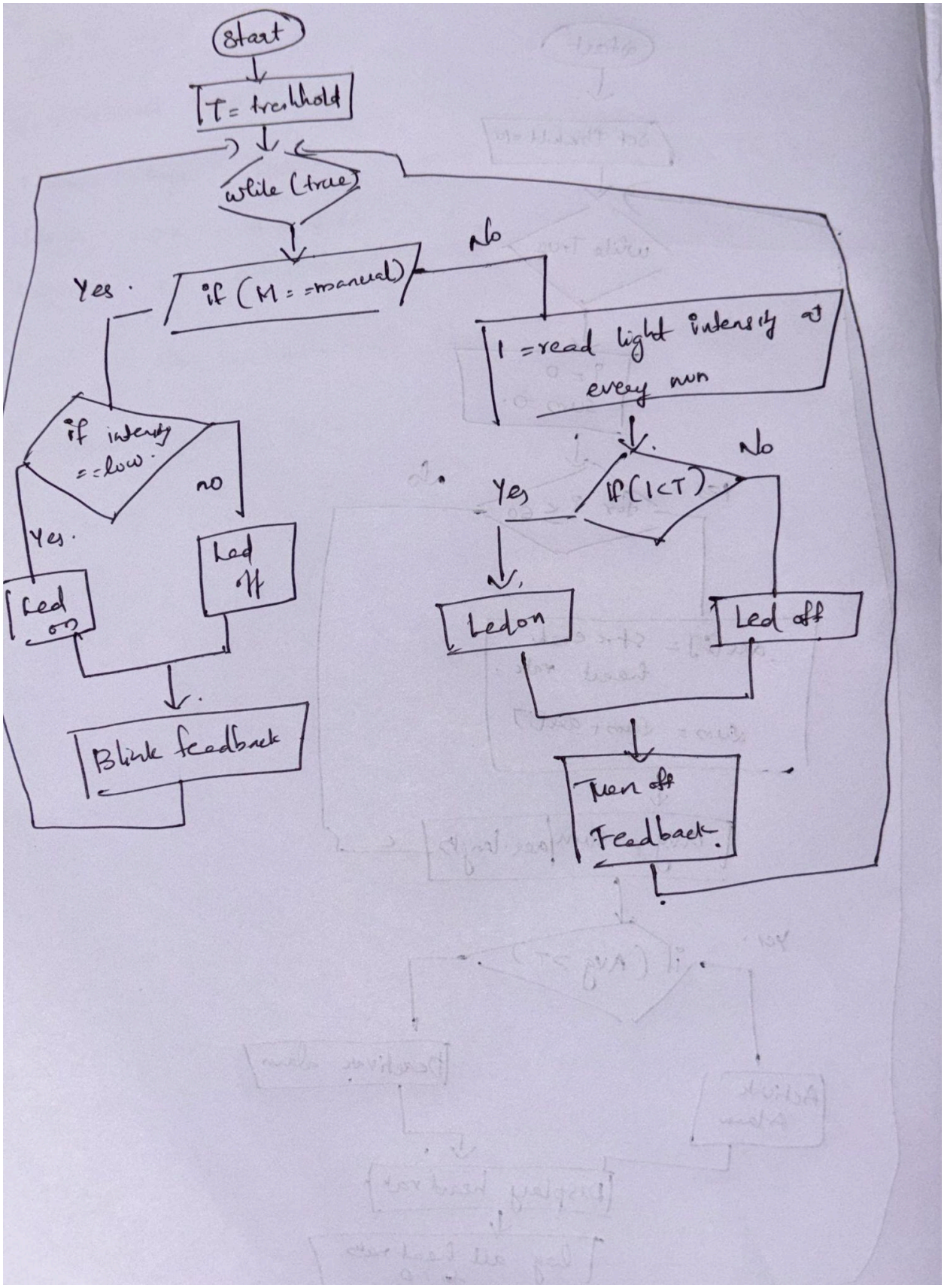
Turn OFF LED

ENDIF

Turn OFF feedback LED

ENDIF

End While


Start
T = treshhold
while (true)
if (M == manual)
Yes
No
if intensity == low
Yes
no
Led on
Led off
Blink feedback
I = read light intensity every min
If (I < T)
Yes
No
Led on
Led off
Turn off
Feedback

6. Digital Stopwatch

Intialise button state as stop

Intialise time as 00:00:00

Intialise buffer as 00:00:00

while(true):

Read button input(start/pause/resume/stop)

if(button==start)

start Updating time

Display time in hr-min-sec in lcd screen

Log start time in sd card

Else if(button==pause)

Store current time in buffer

Pause updating time

Else if(button==resume)

Resume time update from buffer value

Else if(button==stop)

Log stop time in sd card

Reset time as 00:00:00

Display reset time on LCD

Else

Display current time in hr:min:sec in lcd screen

endif

End while

7. Temperature Logging System

Psueocode

Set array or log file to store temperature data

while (true):

Wait for 10 minutes

IF (sensor error detected):

Display "Error: Unable to read temperature"

ELSE

timestamp Get current time

temperature = Read temperature from sensor

Store (temperature, timestamp) in data array or log file

ENDIF

END while

Function retrieve HistoricalData():

Display data array or log file content

8.Bluetooth Controlled Robot

Initialize Bluetooth = OFF

Initialize currentState = 'STOP'

Initialize command = 'STATIONARY'

```
Initialize forward = 0, backward = 0, left = 0, right = 0

Initialize speed = 0

while (true):

IF (Bluetooth == OFF);

currentState = 'STOP'

Set Feedback LED = OFF

ELSE:

IF (command == 'FORWARD'):

forward += 1

currentState = 'MOVING_FORWARD'

Set Feedback LED = ON

ELSE IF (command == 'BACKWARD'):
backward += 1

currentState = 'MOVING_BACKWARD

Set Feedback LED = ON

ELSE IF (command == 'LEFT'):

left += 1

currentState = 'MOVING_LEFT'

Set Feedback LED = ON

ELSE IF (command == 'RIGHT'):

right += 1

currentState = 'MOVING_RIGHT

Set Feedback LED = ON
```

ELSE IF (command == 'STOP'):

currentState = 'STOP'

Set Feedback LED = OFF

ENDIF

ENDIF

END while

9. Battery Monitoring System
Pseudocode:

Loop every minute

Read voltage v

If (v != 0)

If (v <11)

buzzer = 1

log event to memory

End if

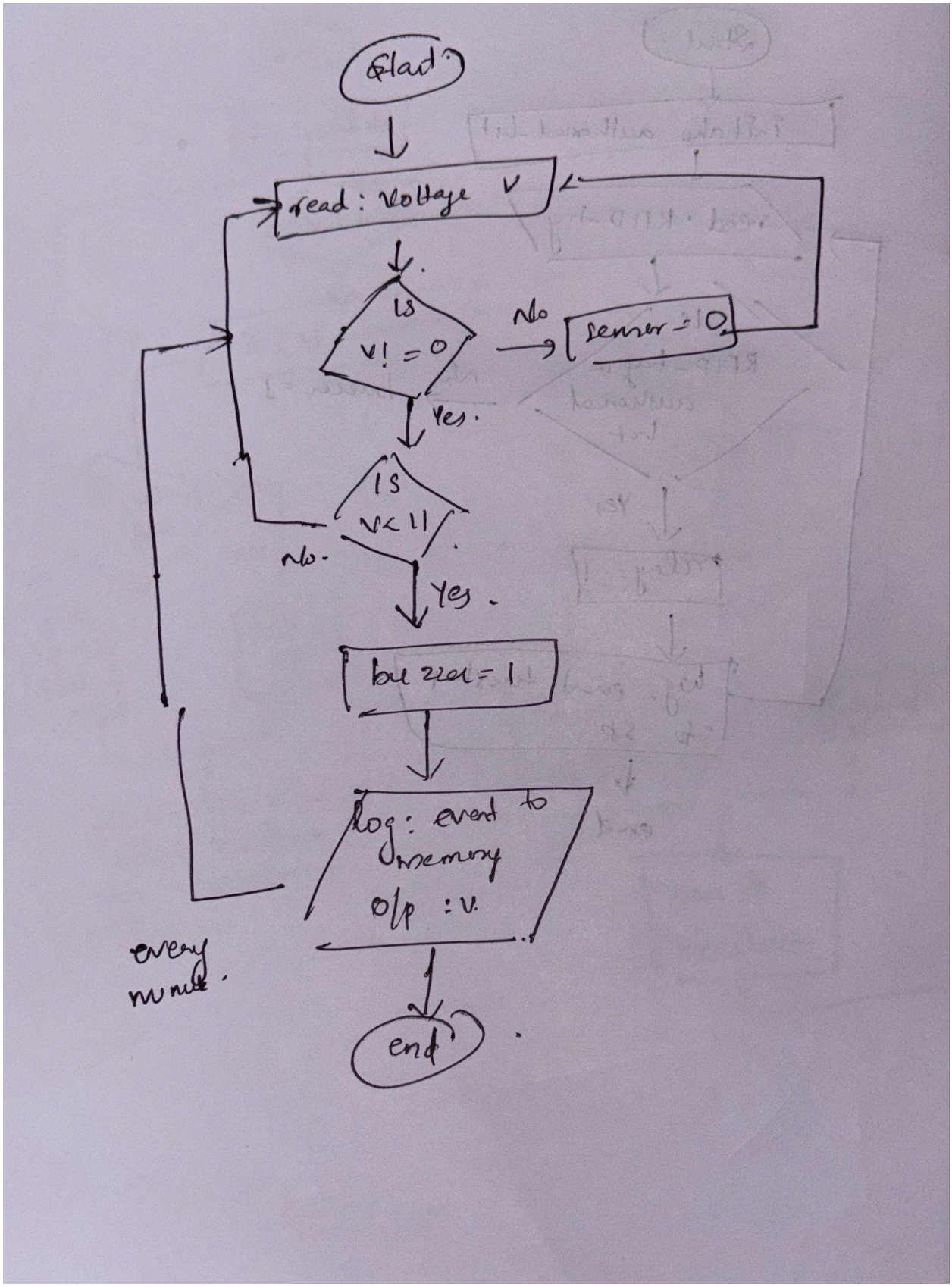
Display v

Else

sensor = 0

End if

End loop


Start
read : voltage V
Is V! = 0
No
sensor = 0
Yes.
Is V < 11
No.
Yes.
buzzer = 1
log : event to memory
o/p : V.
every minute.
end

10. RFID-Based Access Control System
Pseudocode:

Initialize authorized_list

Loop

Read RFID_tag

If (RFID_tag in authorized_list)

relay = 1

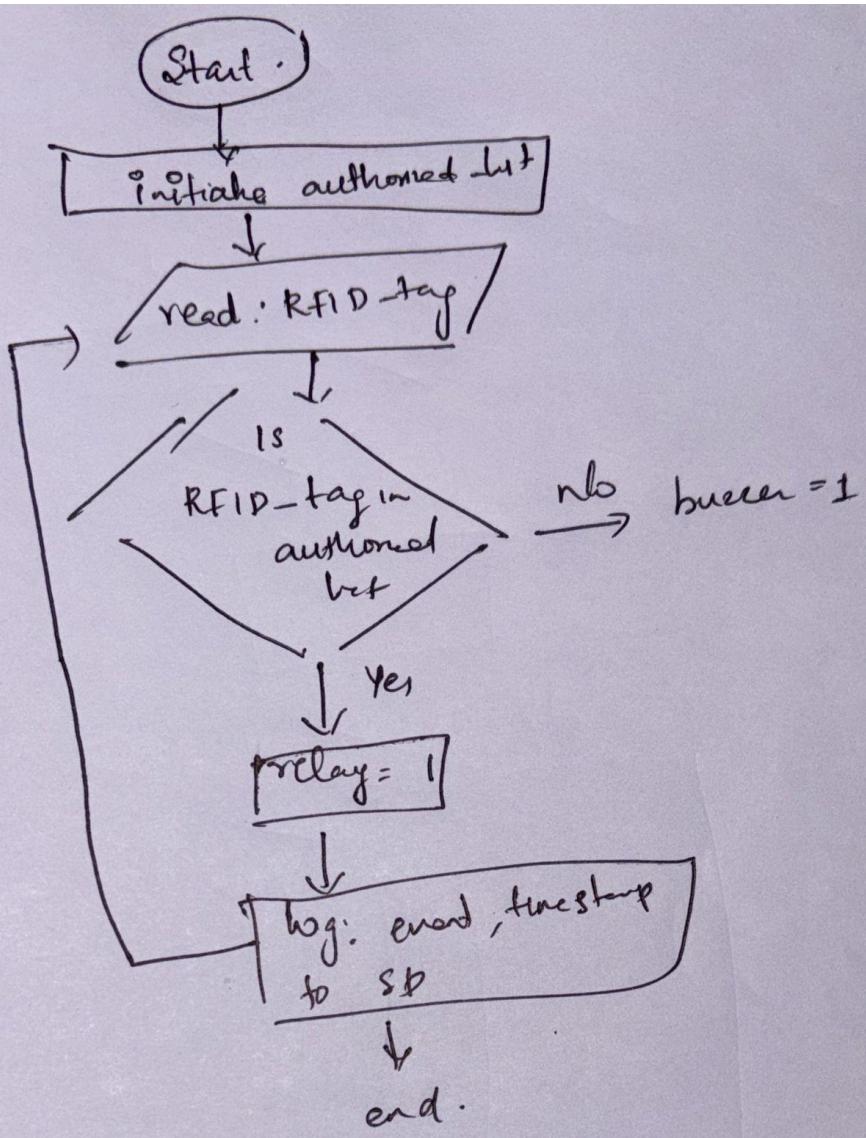
Else

buzzer = 1

End if

Log event with time_stamp to SD card

End loop


Start.
initiate authorized list
read: RFID_tag
Is RFID_tag in authorized list
no
buzzer = 1
Yes
relay = 1
log: event, timestamp to SD
end.