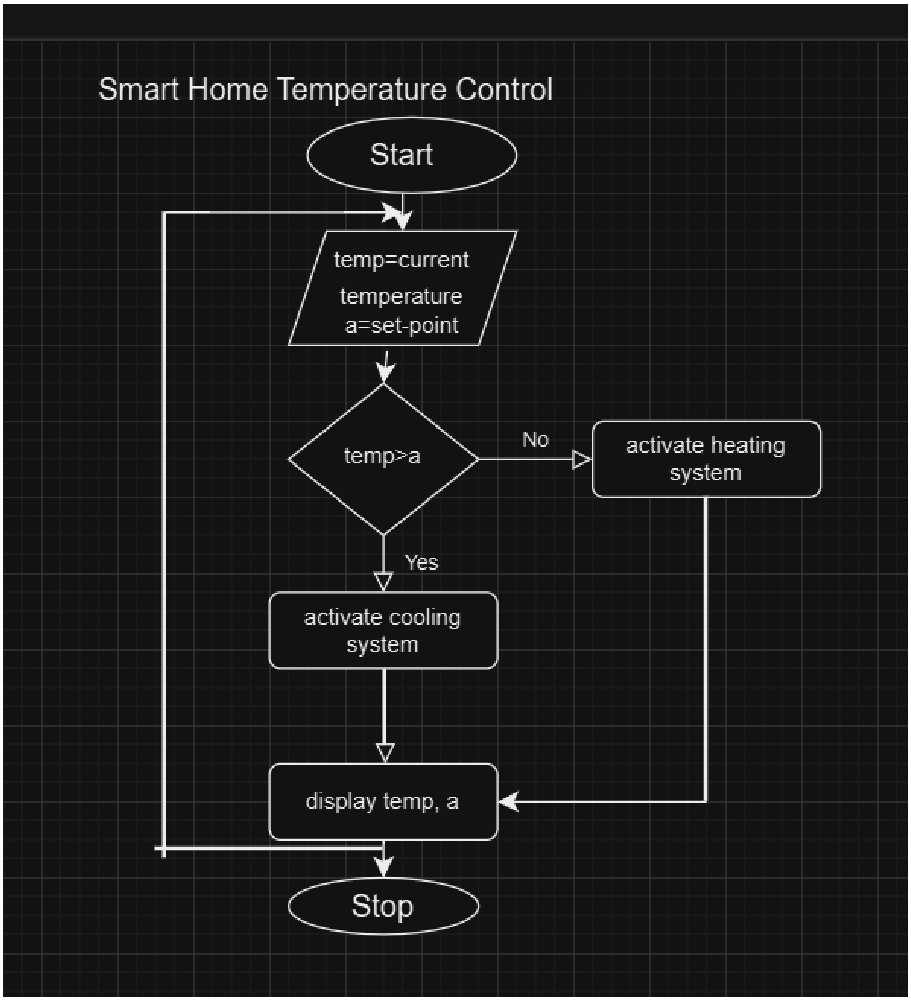
ASSIGNMENT

1. Smart Home Temperature Control Problem Statement:
   Design a temperature control system for a smart home. The system should read the current temperature from a sensor every minute and compare it to a user-defined setpoint.

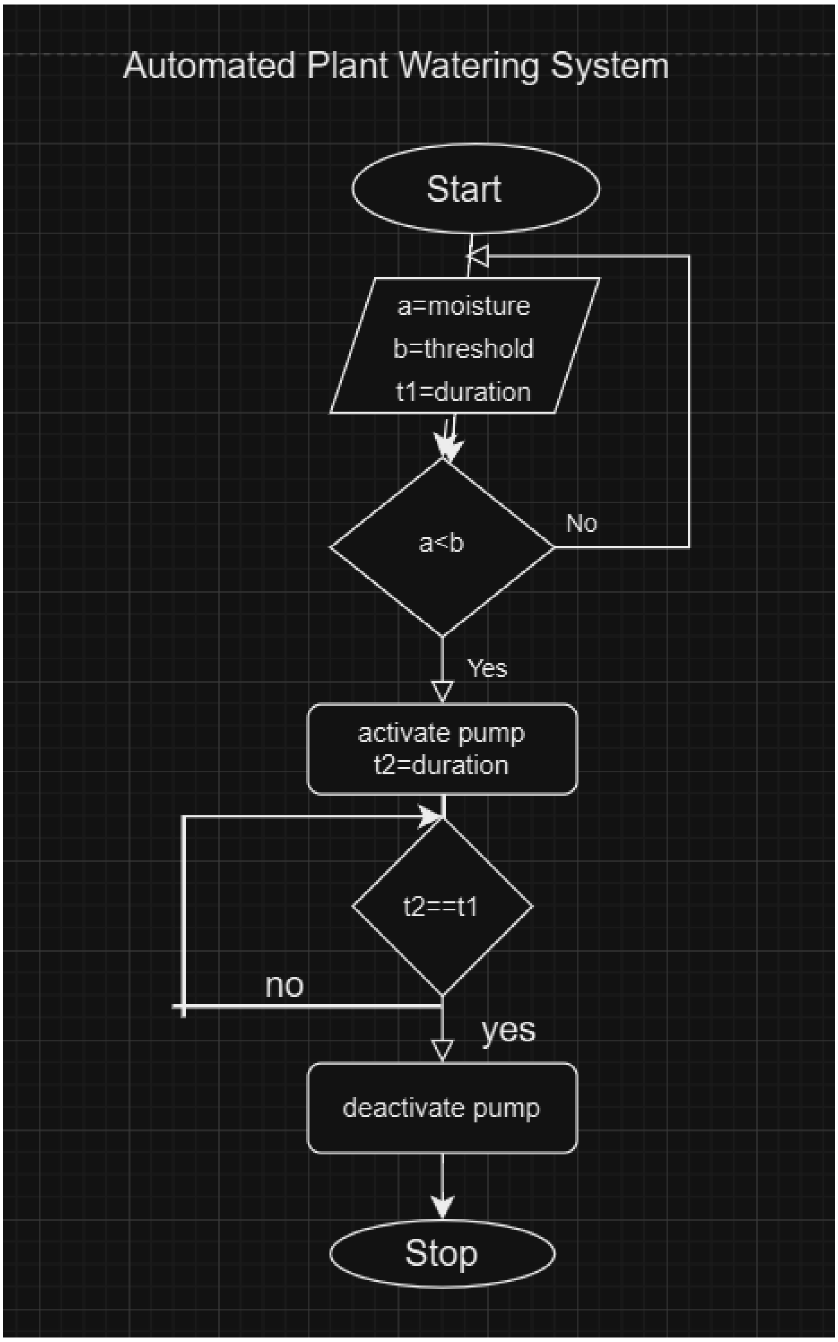
```
1. Read  temp=current temperature
2. a=user-defined setpoint
3. if temp>a, then
   3.1 cooling_system=activate
4. else,
   4.1 heataing_system=activate
5. display temp and a
```



2. Automated Plant Watering System Problem Statement: Create an automated watering system for plants that checks soil moisture levels and waters the plants accordingly.

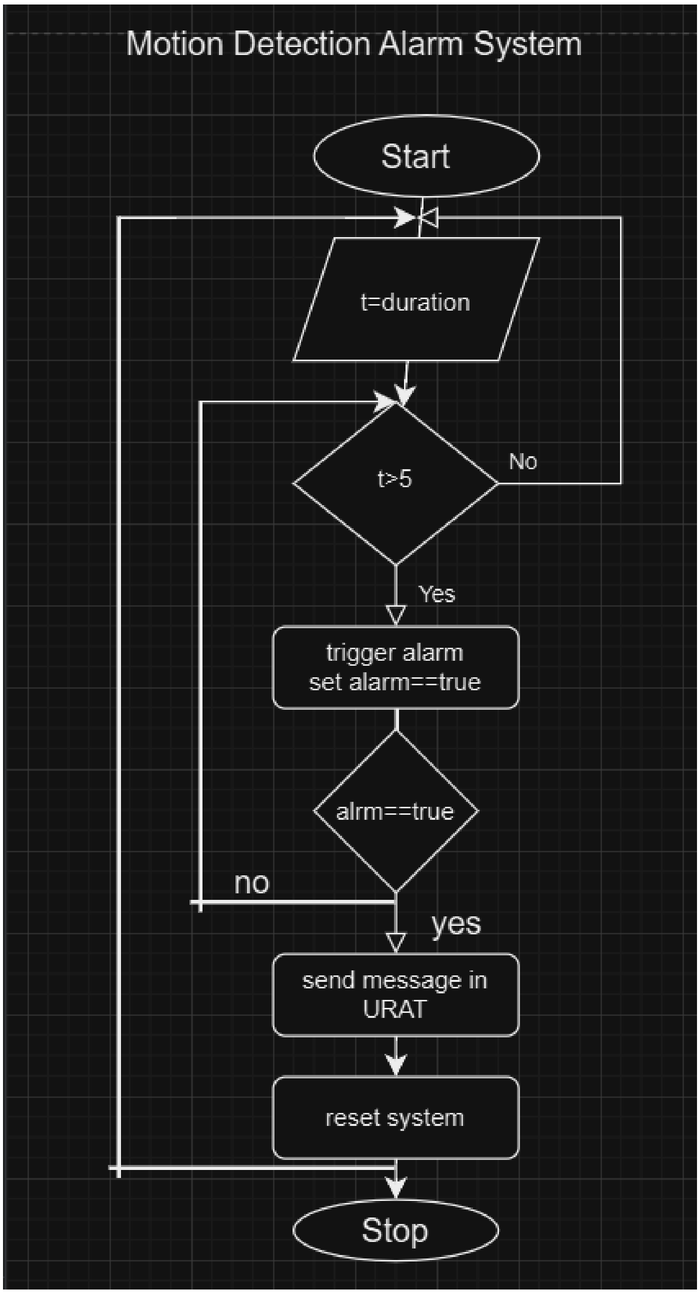
1. Start

```
2. Read moisture as a
3. define threshold as b, duration as t1
4. if a<b, then
  4.1 pump=activate
  4.2 read duration as t2
  4.3 if t2==t1, then
       4.3.1 pump=deactivate
```



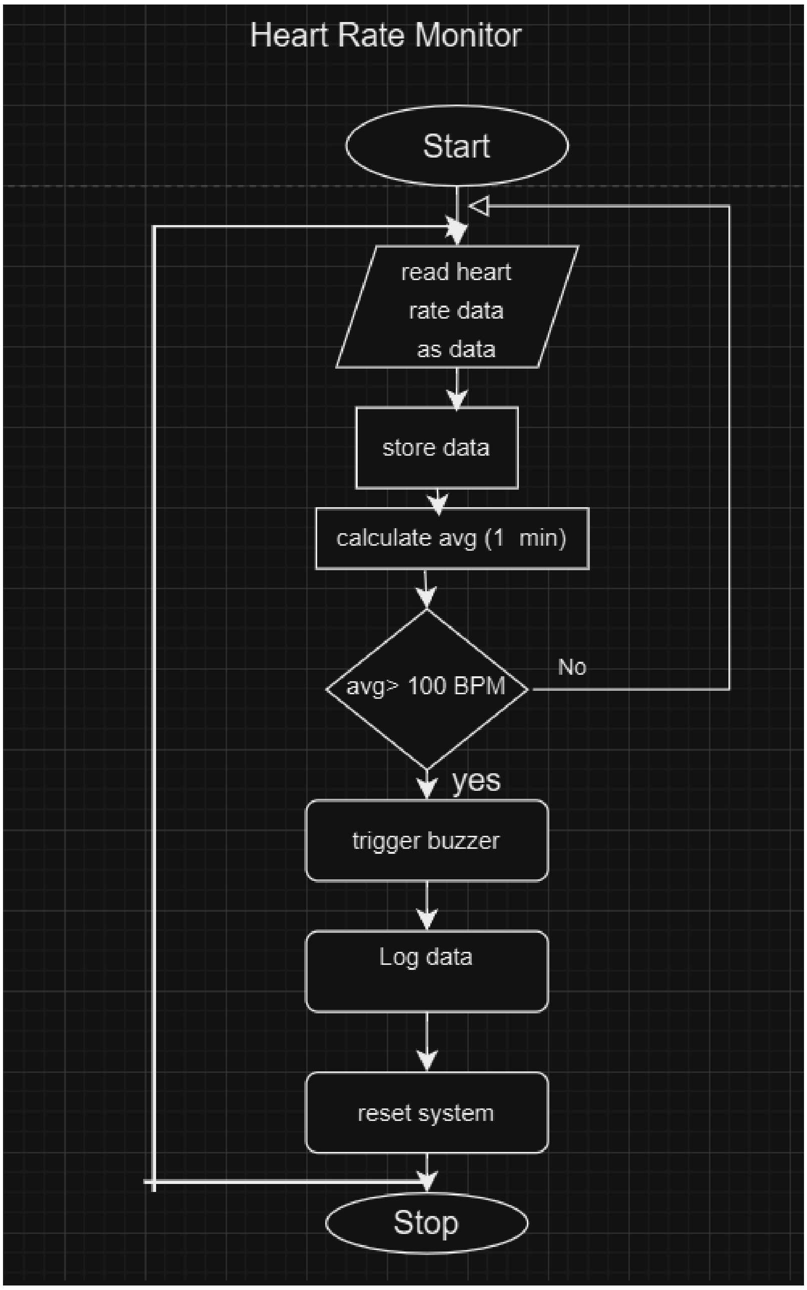
3. Motion Detection Alarm System Problem Statement: Develop a security alarm system that detects motion using a PIR sensor.

```
1. configure PIR sensor
2. read duration as t
3. if t>5, then
   3.1 set alarm=1
4. if alarm=1,
   4.1 send message in URAT
5. reset the system
6. repeat the process
```



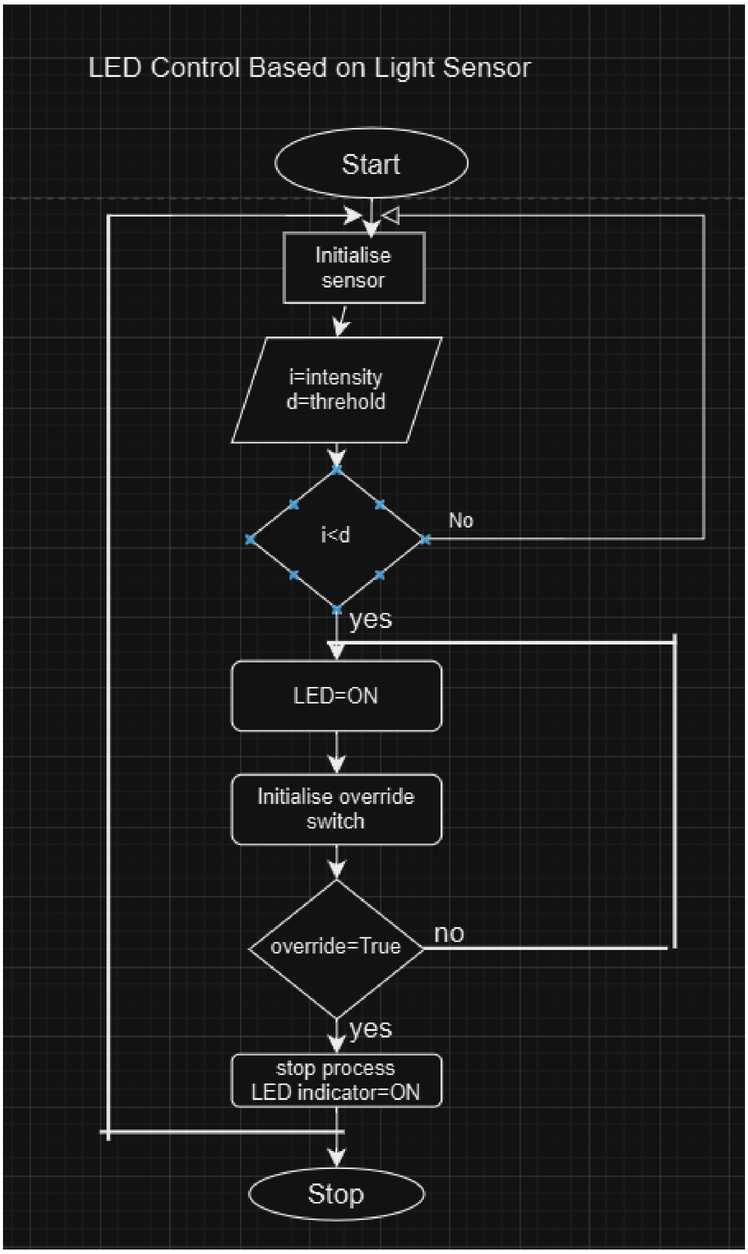
4. Heart Rate Monitor Problem Statement: Implement a heart rate monitoring application that reads data from a heart rate sensor.

```
1. configure heart rate sensor
2. for 0 sec to 59sec:
   2.1 data[]=sensor data
3. avg=data[i]+data[i+1]/60
4. if avg>100
   4.1 trigger alert
   4.2 set flag=true
5. if flag=true,
   5.1 display data[i] and avg
6. save data[i],avg
7. repeat process
8. stop
```



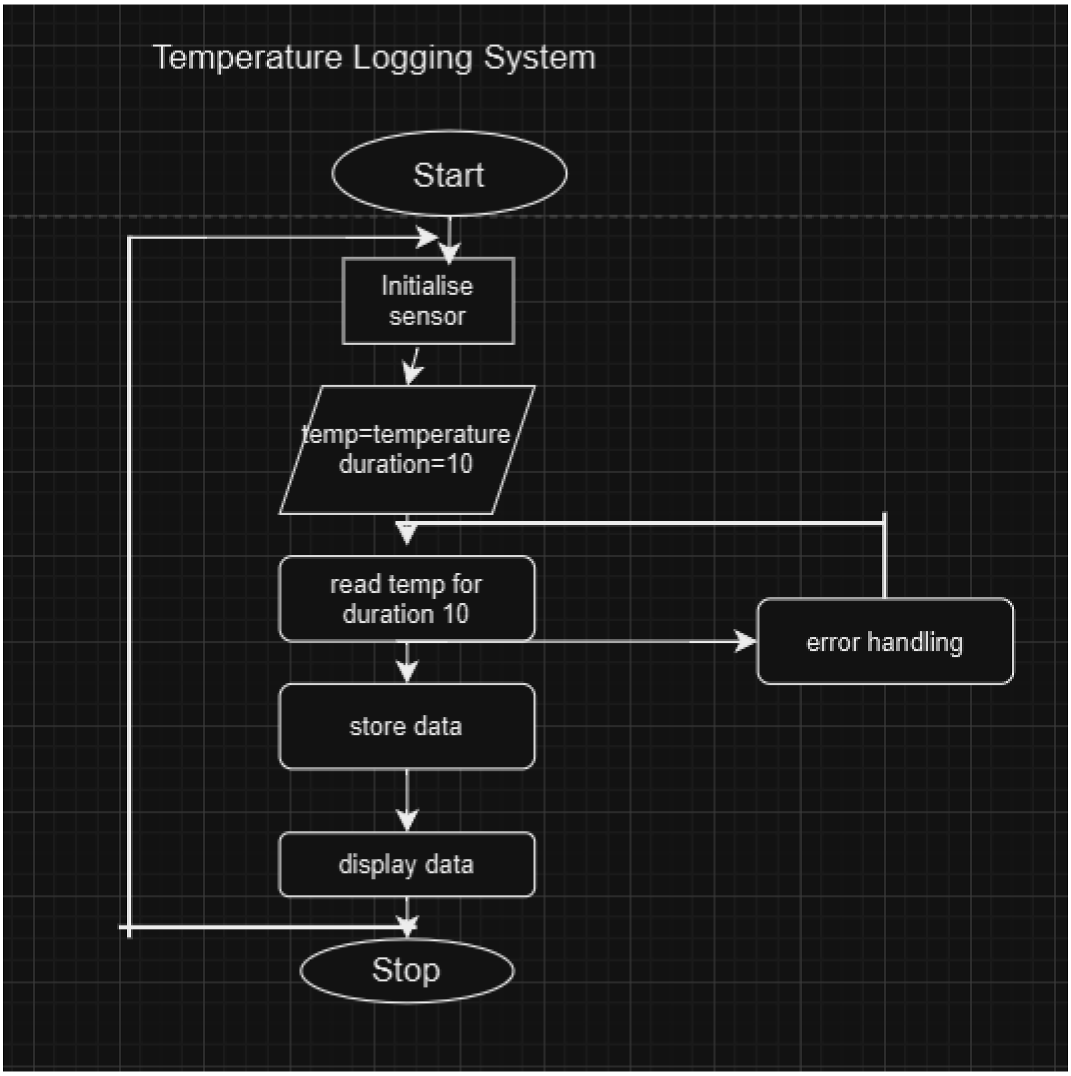
5. LED Control Based on Light Sensor Problem Statement: Create an embedded application that controls an LED based on ambient light levels detected by a light sensor.

```
1. Initialise sensor to read light intensity
2. i=intensity
3. set threshold d
4. if i<d, then
   4.1 LED=on
5. else, LED=off
6. initialise override switch as s:
  6.1 if override status=true
      s=active
  6.2  while s[active]==true
      LED=on for manual
7.stop
```



7. Temperature Logging System Problem Statement: Implement a temperature logging system that records temperature data at regular intervals.

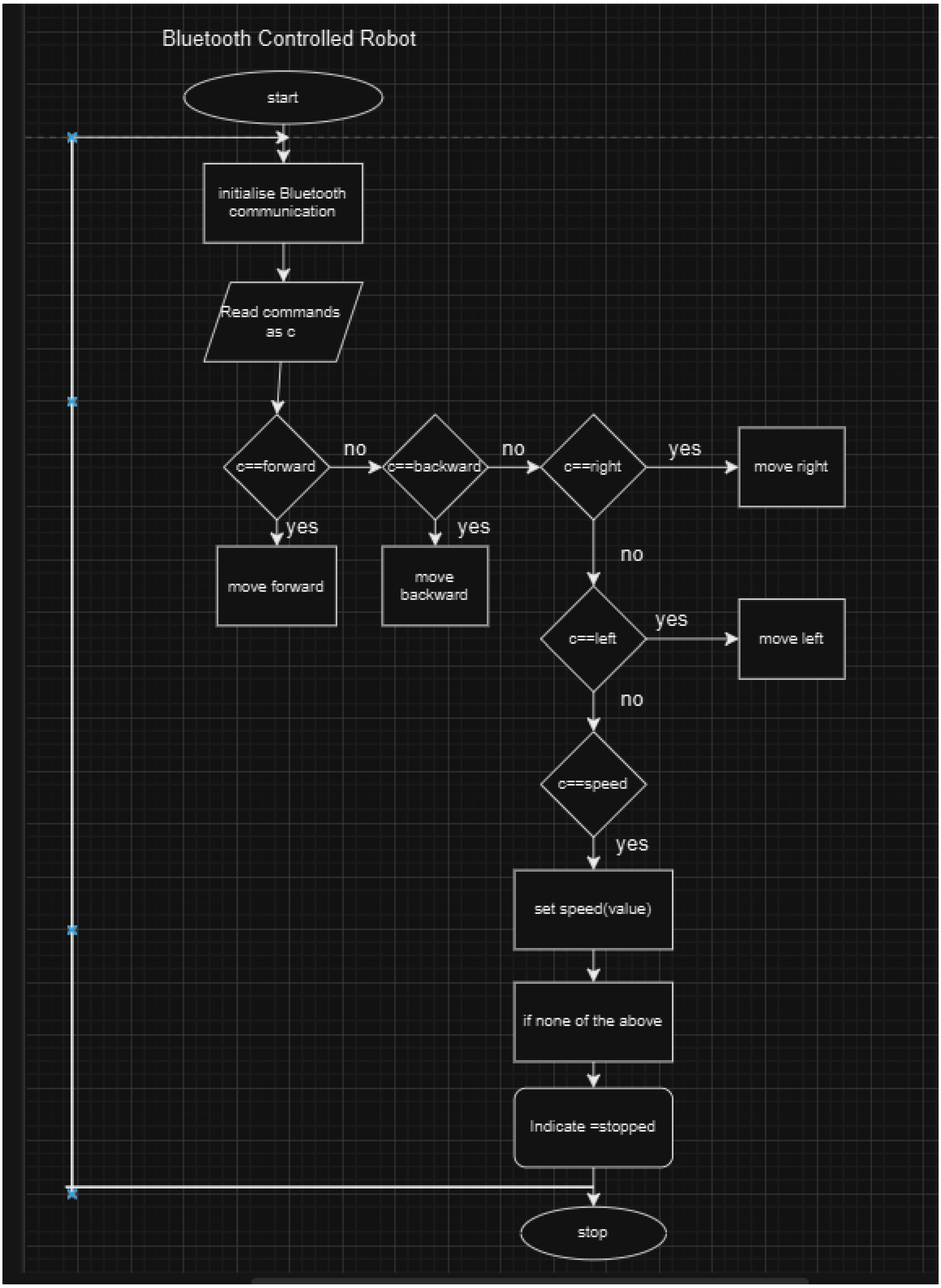
```
1. initialise sensor to read temperature
2. set duration = 10 min
3. read temp as temperature
5.  for duration i=(0,10)
   a[i]=temp
6. if(error)
   display reading error
7. retrieve data
8. go to step 3
```



8. Bluetooth Controlled Robot Problem Statement: Create an embedded application for controlling a robot via Bluetooth commands.

Bluetooth Controlled Robot

```
1. initialise Bluetooth
2. configure commands
  2.1 forward
  2.2 backward
  2.3 left
  2.4 right
3. set speed(value)
4. in loop:
  read command as c:
    if c==forward:
      move forward
    elif c==backward:
      move backward
    elif c==left:
          turn left
    elif c==right:
          turn right
    elif spped=read speed:
      set speed(value)
    else:
      display stopped
5. stop
```

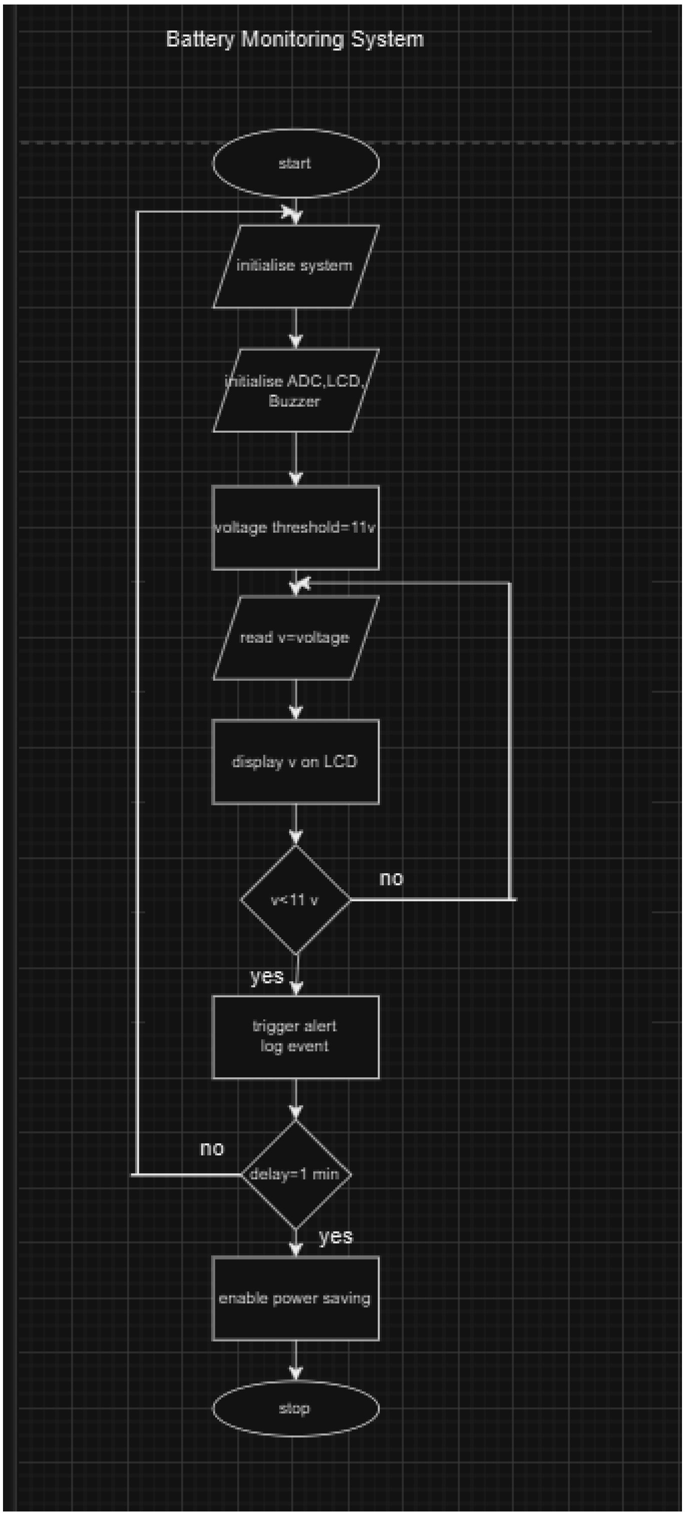


9. Battery Monitoring System Problem Statement: Develop a battery monitoring system that checks battery voltage levels periodically and alerts if voltage drops below a safe threshold.

1. Initialise the system

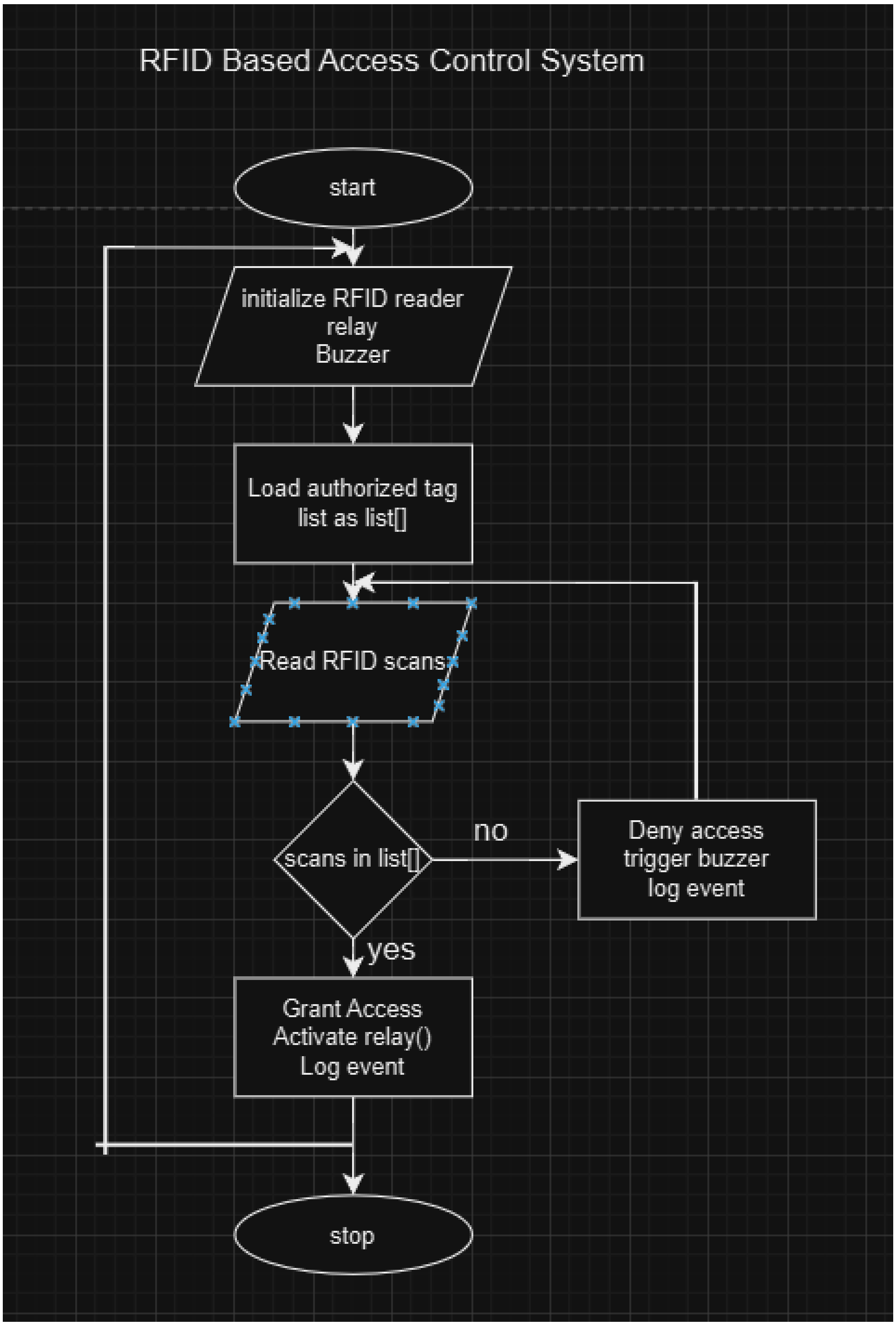
2. Initialise ADC, LCD, buzzer

```
3. set voltage threshold=11v
4. in loop
   4.1 read voltage as v
5. display v on LCD
6. if v<11v:
    6.1 trigger alert
    6.2 log event
7. if delay(1 min)
    7.1 enable power saving mode
8. stop
```

Battery Monitoring System
start
initialise system
initialise ADC,LCD, Buzzer
voltage threshold=11v
read v=voltage
display v on LCD
v<11 v
no
yes
trigger alert
log event
no
delay=1 min
yes
enable power saving
stop

10. RFID-Based Access Control System Problem Statement: Design an access control system using RFID technology to grant or deny access based on scanned RFID tags.

```
 1. Initialize the system
2. initailaize RFID reader,relay, buzzer
3. load RFID tags from memory
4. in loop:
  4.1 read RFID tag scans
  4.2 compare scanned tag with authorized list
   4.2.1 if tag in list:
        grant access
        activate relay()
        log event
   4..2.2 else:
        deny access
           activate buzzer()
        log event
5. go to step 2
6. stop
```


RFID Based Access Control System
start
initialize RFID reader
relay
Buzzer
Load authorized tag
list as list[]
Read RFID scans
scans in list[]
no
Deny access
trigger buzzer
log event
yes
Grant Access
Activate relay()
Log event
stop