Project Description – Smart house Management

The smart house is monitoring current temperature and humidity. Additionally, it also monitoring intruder coming near to the house. The aim is to monitor this information both from inside and outside the house.

Inside the house, node_1 is collecting **temperature** data from the environment using a digital sensor and sends it to node_2. The node_1 is also collecting information to measures the **distance** of a target object using a digital sensor and sends it to node_3. An RGB LED is connected with node_3. After receiving this information node_3 node changes the brightness of the RGB LED from red to blue and blue to red dynamically. For example: If the distance of a target object of the Master node increases, then RGB LED of the node_3 changes dynamically from blue to red, and if the distance of a target object of the Master node decreases, then RGB LED of the node_3 changes dynamically from red to blue.

Additionally, with the node_2, 3 push-buttons, and an RF module is connected. When push button P1 is pressed then node_2 sends this information ("P1 push button is pressed") to Receiver A (Arduino board) using RF module. Similarly, when push-button P2 and P3 are pressed then node_2 sends this information to the Receiver B (Arduino board) ("P2 push button is pressed") and Receiver C (Arduino board) ("P3 push button is pressed") using the RF module.

Phase 1:

a) Read the project description. Draw a block diagram, based on the project description. Clearly identify each component of the block diagram by it's name, used communication protocol's name,
b) Divide the problem in the project to sub-problems. Provide the list of sub-problems.

Phase 2:

a) Describe each sub-problem.
   i. No: `index of the sub-problem`
   ii. Title: `explain the Sub problem in one or two line.`
   iii. Block diagram: `Using a block diagram show the connection to implement this sub problem.`
   iv. Code: `Write code in Arduino ide to implement this sub-problem.`
   v. Simulation: `Simulate each sub-problem in Proteus.`

Phases 3:

a) Simulate the complete project in Proteus and write the corresponding code.
b) Describe the additional features that can be added to the project.

Instruction 1:

Write the appropriate code. Add comment to the code to improve readability.

Example Code with comment

```
// pin 13 has an LED connected with the Arduino board.
int led = 13;
digitalWrite(led, HIGH);  // turn the LED on (HIGH is the voltage level)
```

Instruction 2:

Arduino files (.ino and .hex) and Proteus files (.pdsprj) must be zipped together (.zip). Inside the Arduino file, on the top mention student id and name as a comment block. In addition, inside the Proteus files, mention student id and name using “Text script mode”.