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## LAB 5 – SMART HVAC SYSTEMS

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**Estimated time to complete this Lab:** 45 Minutes.

### Objectives

After completing this lab, you will be able to:

- For the given scenario select types of thermostats that meet the customer's requirements.
- Identify locations for the new thermostats.

Read the following scenario and complete the exercises that follow.

### Scenario background

Digital Automation Ltd is a technology service and products supplier serving the home integration needs of the building industry in the Silicon Valley region. The company is currently working on an extensive project that involves the integration of various advanced electronic components into one easy-to-use automation system. A licensed HVAC contractor will install the climate control element of the project and you have been asked to assist the contractor with interfacing to a smart home system.

The system will include one HVAC zone controller, various thermostat units, and a damper unit for each zone.

The following table includes a general requirement that was gathered during interviews and written documentation.

Requirement category	Details
Zoning	Two separate zones are to be set up – upstairs and downstairs.
Integration	The HVAC equipment needs to be integrated into the smart home automation environment.
Functionality	Easily program selectable climate modes for different personal tastes, times of day, seasons, vacation, and work schedules

### Exercise 1 – Select Thermostat Type

To save energy, the new system will allow automatic heating of the bedrooms upstairs at night, while the living area downstairs is turned off. What type of thermostat should be installed to provide this type of functionality?

Answer and Explain.

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**Exercise 2 - Identify suitable locations for thermostats.**

A small number of different types of thermostats are required for this project. In this exercise, you will recommend appropriate locations for installing the thermostats. The table below identifies which of the locations are acceptable (yes) and which are unacceptable (no). If the location is unacceptable as written, explain why.

Location guidelines	Yes	No	Reasons
The thermostats for the downstairs zone should be mounted on the exterior wall.			
The thermostats for the downstairs zone should be located close to the front door.			
All thermostats are to be mounted 2 feet (24 inches) above the floor.			

Furthermore, on the following illustration, draw and label your recommended locations of smart security sensors.



Exercise 3 - Identify an unsuitable location for thermostats.

On the following floor plan of the downstairs of the house, identify a room in the house where thermostats should NOT be located.



Answer and Explain.

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