Write python programs based on Data structures (list, dictionaries, tuples, algorithms) in building codes.

Once finished making the 2 programs, do the following:

1.1. The business requirement (POS)

1.2. Explain these codes and its purpose.

1.3. Program execution (option 1, option 2, option 3, option 4)

2.1. The business requirement (Hotel)

2.2. Explain these codes and its purpose.

2.3. Program execution (option 1, option 2, option 3, option 4, option 5)

Criteria:

|  |
| --- |
| Creation and usage of user-defined functions |
| Usage of Data Structure such as List, Tuples, Dictionary, Linked List, Sorting Algorithms, Search Algorithms, Stacks and Queues, Hash Tables, Recursion |
| Optimized code and proper alignment. Program readability |
| Correct program behavior based on requirements |
| User input validation |

**Case Study 1: Point of Sales System (POS)**

Welcome to the Fast-Food Chain. Please choose among 4 options:

1. View/Add Inventory

2. Punch Order

3. View Sales

4. Exit

* Products:   
  a. Burger (50.00)  
  b. Beverage (20.00)  
  c. Fries (35.00)
* Zero inventory in all products at start run.
* Allow user to add inventory using option 1.
* Allow user to enter [number of items] to purchase (when [number of items] is greater than the remaining inventory, show "Insufficient stock for that number of items.")
* Display Sales depending on the accumulated amount purchase. Sales must be viewed in product level. (e.g., Burger 300.00, Beverage 120.00, Fries 70.00)
* The program continues to display the four options until the user presses 4 (Exit)

Code Here:

Functions Created and Definition:

Codes with Data Structure implementation:

**Case Study 2: Hotel Management System (Hotel)**

Welcome to the Hotel. Please choose among 5 options:

1. Check-in

2. Check-out

3. View Sales (in highest order)

4. View Sales (in lowest order)

5. Exit

* Upon checking in, a customer will choose 1 from 3 room types:  
  a. Single (1500.00)  
  b. Double (2500.00)  
  c. Suites (5000.00)
* Each room type consists of 10 rooms (constant)  
  - Single (Room #1, #2, #3 ... #10)  
  - Double (Room #11, #12, #13 ... #20)  
  - Suites (Room #21, #22, #23 ... #30)
* After choosing room types, the system should display available rooms and allow user to choose 1 from available room numbers.
* After choosing room number, the system should display "You are about to check in to Room #1 Single. Your bill is 1500. Thank you!" -- this is when the user selects "Single" Room Type, #1 Room.
* When all rooms are occupied, display “Hotel is fully booked” when user chooses option 1.
* When a customer wants to check out, the system should allow the user to select Room Type first. After selecting the room type, display the occupied rooms and enter room number to checkout.  
  - Display Sales (option 3) in Room Type level. (e.g., Single 1200, Double 15000, Suites 30000)  
  - No customer can check in to an occupied room  
  - When a customer checks out, the room should turn from occupied to available  
  - Option 3 will display the accumulated sales sorted in highest order  
  - Option 4 will display the accumulated sales sorted in lowest order  
  - The program continues to display the four options until the user presses 5 (Exit)

Your Code Here:

Functions Created and Definition:

Codes with Data Structure implementation: