CS 224 Introduction to Python | Spring 2019

Programming Assignment 3

University of Wisconsin – La Crosse | *Due Date: April 29*

Paging Mr. Otis

Description: For this assignment, you will write several Python classes to simulate an elevator.

Details: Your simple elevator simulator will control a single elevator in a building. You will implement two strategies: a default strategy and one that you design. The default strategy is very straightforward: the elevator starts at a random floor, travels to the top floor, reverses direction and continues until all passengers have been picked up and dropped off. You should track the number of floors the elevator travels to service all requests. Note that passengers only get on the elevator when it is traveling in the direction of their desired floor.

The following will help you design your code:

- Implement three classes: Building, Elevator, and Passenger. See below for more details.
- Your program will prompt the user to enter the number of floors in the building and the number of passengers. The inputs should be verified as valid (positive integers). If they are invalid, the user should be asked to re-enter them.

- Each passenger is on a floor chosen at random. Their destination floor is also chosen at random.
- Each passenger rides the elevator exactly one time.
- Every time the elevator moves you will print a representation of the building showing every floor and all of the passengers on that floor including those waiting for the elevator and those that have already exited the elevator.
- The simulation ends when all passengers have reached their destination floors.
- Do not use any global variables.

The Classes: Each of the three classes will have the data attributes and methods listed below. You may add others.

Class	Attribute/Method	Description
Building	num_floors	Number of floors in the building
	passenger_list	List of passengers
	elevator	The building's elevator (object)
	run(self)	Method that operates the elevator
	output(self)	Prints the building
Elevator	num_floors	Number of floors in the building
	register_list	List of customers in the elevator
	curr_floor	Current floor the elevator is on
	direction	Direction of travel
	move(self)	Method to move the elevator one floor
	reg_pass(self, passenger)	Passenger enters elevator
	exit_pass(self, passenger)	Passenger exits elevator
Passenger	src_floor	Passenger's starting floor
	dest_floor	Passenger's destination floor
	direction	Passenger's director of travel
	id	Passenger's ID
	in_elevator	Indicates if passenger is in elevator
	done	Indicates if passenger arrived and exited

Adhere to common coding conventions and **comment your code.**. Include a comment at the top that looks like this:

```
#
# CS 224 Spring 2019
# Programming Assignment 3
#
# Your wonderful, pithy, erudite description of the assignment.
#
# Author: Your name here
# Date: March 13, 2019
#
```

Submission: The name of your program must be `otis.py`. Submit your solution as a compressed directory by 11:59 PM on the due date. In addition to the program, you must submit a README file that describes your elevator strategy and compares its performance to that of the default strategy.