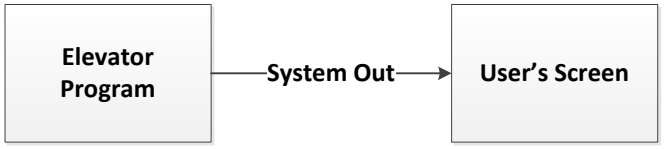
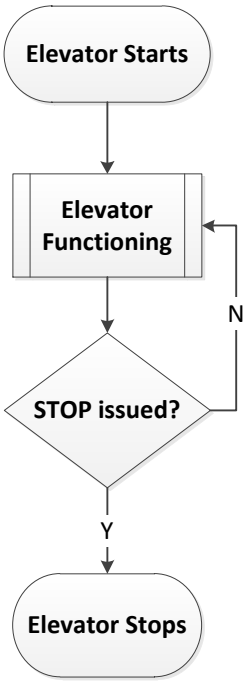
Java Elevator Simulation

Objective: Using **TDD**, write a Java program to simulate behavior of a lift





Instructions:

- This is NOT a web-app. Just create simple Java program
- Make reasonable assumptions if you happen to run into something
- This is a simulation, so we will not have to bother about driving hardware etc. ☺
- The elevator starts as the Java class is run
- It then functions for as long as user provides input from console (System In)
- It stops when 'STOP' command is issued through the system console
- It should show statuses by flushing messages to the system console
- Verbiage of the message isn't important
- Lowest level is '1' and highest is '10'
- Only one person enters at a floor
- No one enters when a person is dropped off at a floor
- More than one person can be dropped off at a floor
- One request at a time
- Modularize code

Features:

1. As a user, I want to be able to request for an elevator to go up or down to other levels in my building.
2. The elevator should be able to accept my current level as input.
3. The elevator should be able to accept requests at all times, even while serving another request.
4. Elevator's direction of travel is set based on the first request that it receives, in its idle state, i.e. it has no requests to serve.
5. The target level at any time is the highest (or lowest) level a request is received from, in the given direction of travel.
6. As a user, I want the elevator to follow optimal routes. In other words, the direction of the elevator should be maintained, i.e., if the elevator is moving in the upward direction, all the requests for going up should be served first.
   Scenarios:
   a. While the elevator is in its upward course, given that the target level is higher than my level, I should not be picked up if I request to go in the downward direction. My request will be served only during the downward course. I will not be picked up until all the other users on levels in the same direction are picked up. Same will be the case when the elevator is in its downward course and I need to go in the reverse direction.
   b. If my current level is higher than the target level (until the elevator is about to pick me up) the elevator is moving towards, I should be picked up regardless of my direction of travel.
   c. In the upward course, the elevator should pick me up when my direction of travel is same as its current direction and my level is greater than or equal to its current level.
   d. I should be dropped off when the elevator reaches my destination level in its current direction of travel.
7. As a user, I want to be able to enter the destination level where the elevator should take me to, after entering the elevator.
8. The elevator should continue to serve the existing requests even when an empty request is received.
9. The elevator should remain at the last destination level served, when there are no further requests.
10. As an admin user, I want to be able to suspend the elevator service and return it to the lowest served level.

Message Pattern	**Issued When**
Elevator started	Elevator service is started
Currently waiting for request at level '1'...	Waiting for first request after starting
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service	Any time after starting, when it is not taking destination input
Request noted for Level 'x'	Pick up or drop off request received. The exact level is dynamically displayed part of this message.
Currently moving up	After receiving pick up request
Currently halted at Level 'y'	Picking up. The current level is dynamically displayed part of this message.
Enter destination level	Picking up
Move up next	Going in upward direction after picking up or dropping

	off
Currently dropping off at level ‘z’	Dropping off. The exact level is dynamically displayed part of this message.
Move down next	Going in downward direction after picking up or dropping off
Idle state…	No request available
Returning to level ‘1’	Elevator service is stopped
Thank you for using service	Elevator service is stopped

Sample Interaction:

```
Elevator started
Currently waiting for request at level ‘1’...
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
3 DOWN ↵
Request noted for Level ‘3’
Currently moving up
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
4 UP ↵
Request noted for Level ‘4’
Currently moving up
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
5 DOWN ↵
Request noted for Level ‘5’
Currently halted at Level ‘4’
Enter destination level
7 ↵
Request noted for Level ‘7’
Move up next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
8 DOWN ↵
Request noted for Level ‘8’
Currently dropping off at level ‘7’
Move up next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
↵
Currently halted at Level ‘8’
Enter destination level
7 ↵
Request noted for Level ‘7’
Move down next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
6 UP ↵
Request noted for Level ‘6’
```

Currently dropping off at level ‘7’
Move down next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
↲
Currently halted at Level ‘5’
Enter destination level
4 ↲
Request noted for Level ‘4’
Move down next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
↲
Currently dropping off at level ‘4’
Move down next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
↲
Currently halted at level ‘3’
Enter destination level
2 ↲
Request noted for Level ‘10’
Move down next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
↲
Currently dropping off at level ‘2’
Move up next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
↲
Currently halted at level ‘6’
Enter destination level
10 ↲
Request noted for Level ‘10’
Move up next
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
↲
Currently dropping off at level ‘10’
Idle state...
Enter level to be picked up from & direction as UP/DOWN or STOP to suspend service
STOP ↲
Returning to level ‘1’
Thank you for using service