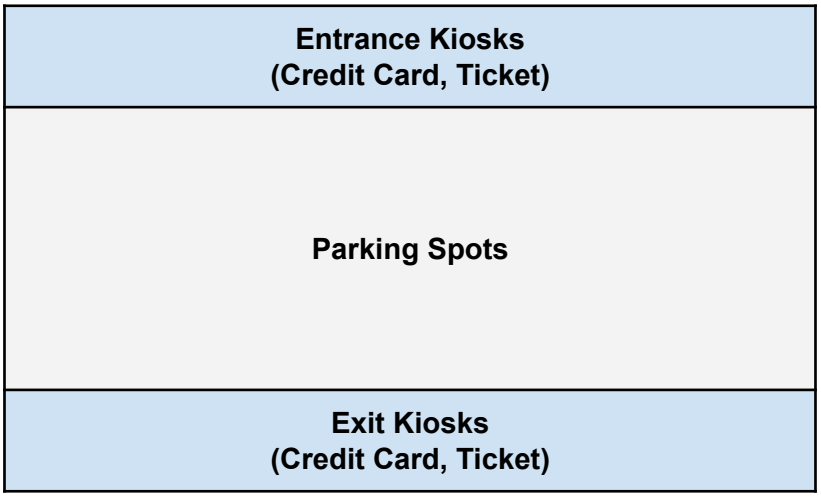
DIT636 / DAT560 - Quality Scenario Exercise

You have been asked to develop the software for a new automated parking system at the Gothenburg Landvetter airport.



The core functionality offered by this system includes:

- Allowing users to enter the parking garage.
    - (Option 1) A user can insert their credit or debit card into the card reader at the ramp entrance. This will record the time they entered airport parking.
    - (Option 2) The system should also support ticketed parking, where the user receives a ticket on entering. This ticket records the time they entered.
- Allowing users to pay for parking.
    - (If the user used Option 1). The user uses the same credit or debit card to pay at an exit lane.
    - (If the user used Option 2). The user inserts the ticket, then pays using a credit card, debit card, or physical currency.
- Allowing users to exit the garage after paying.

You may infer additional functionality from the information below.

The system should be fully automated. The system needs to interact with a number of entities and systems, including:

- Customers parking in the ramp
- Airport police and emergency responders (who should be able to enter without paying or getting a ticket).
- External systems for validating credit card payments
- An accounting database.
- Physical gate hardware with basic controllers (raise / lower).
- Physical signs with displays indicating the number of remaining parking spots.
- Security systems, including cameras and alarms

You will describe scenarios using the following template:

- Overview
  - Brief description of what the scenario illustrates, provides important context.
- System State
  - Aspects of the system's internal (before the stimulus) that could affect quality (e.g., information stored in the system, number of concurrent logged-in users, previous failures that may influence execution).
- Environment State
  - Aspects about the system's environment - external systems, actors, or physical factors - that could influence quality (e.g., other pieces of software, hardware, users, or the physical environment).
- External Stimulus
  - Input event(s) or environmental factor(s) that initiate the scenario. (e.g., requests, user interactions, timing events, infrastructure changes, software or infrastructure failures, security attacks, etc.).
  - Name both the actors who initiated the stimulus and the actions performed.
- Required System Response
  - How should the system respond (from a functional point of view)? (e.g., how should it handle a defined increase in requests?).
  - Focus on actions that relate to the quality attribute of interest. For example, if discussing performance, discuss how performance is maintained.
- Response Measure
  - A measurement used to assess quality, along with a threshold that must be met to succeed.
  - Based on the quality attribute of interest.

Based on the above template, create the following scenarios:

1. **Create a reliability scenario.**
2. **Create an availability scenario.**
3. **Create a performance scenario.**
4. **Create a scalability scenario.**

You may make any assumptions you want about unstated elements of system functionality. State all assumptions made.