

CS 5/7318 Object-Oriented and Design

Homework #2

(10 Points)

*Due Date: on campus 11:59PM on 2/27, 2024;
off-campus 11:59PM on 2/28, 2024*

1. Draw a use case diagram showing the relationships among the uses cases for leaving a particular automated car park (parking lot). (3 Points)
 - 1) Exit car park by paying using a debit card.
 - 2) Attempt to exit car park without initially entering enough money.
 - 3) Exit car park.

2. Create two or three classes linked by associations to represent the situation below. Please specify appropriate multiplicity, as well as labels for the associations. If there is more than one reasonable alternative, explain the advantages and disadvantages of each.
“A video rental shop, where you must purchase a membership before renting anything.” (1 Point)

3. Please extend the airline system example (class diagram) by including the requirements listed below. (6 points)
 - You are asked to produce a single class diagram showing classes, attributes and generalizations. Need not show operations.
 - Please also describe in text which classes, associations, multiplicities, and attributes are added in the original class diagram for each new requirement and why.
 - 1) Flights fly from one airport terminal to another, but may also have several intermediate stops. A passenger can be booked onto one or more of the legs of a flight.
 - 2) Passengers can query the system to determine at what times flights are available from their desired origin city to their desired destination city (assume they do not care, within a city, about which terminal or airport is used by the airline).
 - 3) Flights have scheduled departure and arrival times, but they can be late, therefore they have actual departure and arrival times as well.
 - 4) The airline may add charter flights that are not regularly scheduled.
 - 5) The airline publishes prices that apply between any pair of cities to which it flies. Business class, regular and seat-sale fares are available.
 - 6) Passengers buy tickets and are charged the prices in effect when their tickets were booked. Each ticket involved a complete itinerary, composed of a sequence of one or more legs. The fare type is not necessary the same for each leg of the flight.
 - 7) Passengers are automatically part of a frequent-flier plan. They accumulate points based on the distance they flew and their fare type (business class or not).