

Week 8 Tutorial – Class Diagram

Question 1: MovieDVD-shop

A movie-shop has the following simple operation. Draw a class diagram to represent its structure.

The system maintains the sale and rent transaction of the movies. The system allows users to browse the catalogue of the movies. The users have to subscribe as a member if they want to rent a movie. Only members are allowed to rent movies.

Members and non-members are allowed to buy the movies. If the members want to buy or rent a movie, they can pay with their member card which has rechargeable credits. Credit is updated on the card during buy/rent operations. A non-member is allowed to buy movies but not allowed to rent movies. The movie catalogues categorize movies by genre.

Question 2: Banking System

A banking system maintains data on customers (identified by name and address) and their accounts.

Each account has a balance and there are 2 types of accounts: one for savings which offers an interest rate, the other for investments, used to perform transactions on stocks.

Stocks are bought/sold at a certain quantity for a certain price (ticker) and the bank applies commission on each transaction.

Question 3: Flights

We want to model a system for management of flights and pilots.

An airline operates flights. Each airline has an ID, name, address, and etc.

Each flight has an ID, a departure airport, and an arrival airport.

An airport as a unique identifier, name, and etc.

Each flight has a pilot and a co-pilot, and it uses an aircraft of a certain type; a flight also has a departure time and an arrival time.

An airline owns a set of aircrafts of different types.

An aircraft can be in a working state or it can be under repair.

In a particular moment an aircraft can be landed or airborne.

A company has a set of pilots: each pilot has an experience level:

1 is minimum, 3 is maximum.

A type of airplane may need a particular number of pilots, with a different role (e.g.: captain, co-pilot, navigator): there must be at least one captain and one co-pilot, and a captain must have a level 3.