

Process and Data Modeling

Exercises for Lecture 3: UML structure diagrams

1. Using nouns and verbs to identify candidate classes and relationships draw the analysis class diagram for the system. Attributes and methods for the classes should be filled in wherever information is available.
2. How to get from the analysis model to a design model? What other classes/relationships should be present?

You should prepare to present your solution to the rest of the class at the next exercise session.

- A Let's start with the work. Tell me what's happening when a customer enters in your library?
- C He or she goes to the corridor where a data search can be done. After selection of which books or journals to lend, the customer goes to the place where he or she can take the sample of that book or journal.
- A You said data search. What kind of data?
- C There is a main data record for every book, author or journal, sorted alphabetically. Every record consists of different data according to type of the product: (book or journal). These records are printed on paper cards, and they are placed in different folders. These records can also be accessed using the computer terminals that can be found in the corridor.
- A That means that your library is computerized. Why are you using both computers and paper records?
- C We live in hi-tech era, so I guess we must stay up to date with technology. Computers were introduced few years ago, but paper records have been there since the library was built. Also some impatient customers can use the paper records if all of the computer terminals are occupied.
- A Are the same data put in the paper records and in the computer records?
- C Yes. All of the old data from paper records was converted to computer records, and new data that we write in paper cards is also written in electronic format.
- A Where is your database?
- C Our database is located on a computer server. This server is the heart of our local area network - all of the terminals located in our library are connected to it.
- A Let's backtrack to the data. You said that same data is stored in electronic format and yet others in paper format. From now on we will refer to both of them with the same name - let's call it the index.
- C I agree.
- A When we talk about index, what kind of information is necessary to perform a search?
- C Data for the books and for the journals is very similar. They have ISBN-the unique number for every book/journal, title, publishing year, publishing house, but books have author and genre, and journals have volume and area. The useful information for performing a data search is ISBNs, titles, authors, genres, volumes and areas. Retrieved results specify the type of the books or journals.

- A Just a second. What are the kinds of books and journals?
- C Apart from paper books and journals, electronic books and journals are also supported in our library.
- A Electronic books and journals. How do you manage these types of items (books / journals)?
- C The server we had is used for storage of these types of items. We produced some of the electronic items, but also in our database we have Internet addresses from electronic books or journals from other libraries we used to cooperate.
- A You have a lot of data to maintain. Is everyone concerned with data input and data maintenance?
- C We have employees to do this.
- A You said employees. I think that they are not parts from this conversation for now. We will talk about them later. The customers are not finished yet. Before going into the process of lending let's try to summarize what we discussed so far. Things are becoming clearer to me now. Every customer can perform a data search for the books or journals. Electronic formats of books retrieved from the search, can be accessed immediately. Paper formats can be lent if there is a free sample. Now you may go to the process of lending.
- C At the beginning, I've made it clear that a user who is in the library after data search can perform a lending. Lending can be done if books or journals are in paper format, and it's done in the lending area in the library. Searched books or journals can be given to the user if free samples of them are in the library.
- A Let's look at the both cases - present and not present sample of the book/journal. What is the flow of events?
- C When sample is not present, the user can make a reservation for it. After that library must inform the user when a sample becomes available. User, than should go to the library and make a lending for that sample. I must say that free sample is kept for the user few weeks after informing it.
- A What if there is a free sample?
- C In that case the employee who is concerned with lending (let's say - lender), takes the ISBN of the lent books or journals and personal data for the user, and writes them in the lending record. Also a date is written in this record, which is stored in the lending database. Every user has a limit of books/journals to lend, and also there is a limit for time keeping of books/journals.
- A You said that lending records are stored in a lending database. Does the "lender" do this or does someone else?
- C Our local network doesn't consist only from search terminals. A "lender" also has a terminal from which he or she can check for user data and free samples. Also quick reports can be done to see which users have books to return.
- A Wait a minute. Our conversation is moving in another direction. We started to talk about employee's duties; we didn't finish with the customers. Let's see. To make a lending a free sample of the book or journal can be present in the library, and a lending record is produced after it.
- C That's it. I must stress again that only paper formats can be lent, because they have a samples. Electronic formats of books and journal doesn't have a samples. In other words they have infinite number of samples, or they are present in the library all the time.

A Is it possible to have no present samples of books or journals from searched user's list? Can users ask a lender to recommend them a book or journal?

C Certainly lender can take a brief look at the user's history of lent books and journals, and if he or she had read a books or journals from the user's interest areas, then he or she can recommend something to the user. User can accept that or not.

A This will be all for now. I think that user's diagram is done, and we can take a look at it.