

Step 3 – Classes and objects

Is it time to work with objects? After all, the course is called Object Oriented Programming! I will demo this during the lecture. In addition, there are videos from the previous year that you have access to. Feel free to take a look at them.

Relevant chapters in the book:

2: Creating classes

3: Visibility modifiers

Remember that you can give me feedback on how the tasks are going. You must answer before the joint session after the exercise begins. Answer form is available [here](#).

Learning objectives for this step are:

- I can create classes with fields and methods.
- I can make designers, and I understand how they work.
- I can create objects.
- I can use a reference variable to access an object (and I understand what that means).
- I can make getters and setters and I understand the purpose of this (encapsulation).
- I can make an enum, and I can use it in a field.
- I know that an object can use this to refer to itself.

Task 1

Create a new project and add a class with a main method.

Task 2

Create a class Book that will initially have 3 fields:

- Title
- Author
- NumberOfPages

Task 3

Create a method in Book that prints (System.out.println) the state of the object - that is, the values of the various fields.

Task 4

Create a constructor with parameters for Title, Author and NumberOfPages. The designer must set the values in the fields of the object to be created.

Task 5

Create an object of type Book in the main method.

Call the method you created in Exercise 3 to see if the object was created as planned.

Task 6

Make getters and setters for all fields in Book. Be sure to set all fields to private access.

Create a Book object in the main method. Change one or more fields in the object using the setter methods. Retrieve the updated values via getters and check that it worked as intended.

Task 7

Create an enum Genre with the values (CRIME, ACTION, FANTASY, CLASSIC and OTHER). Create the enum in a separate file: Right-Click on your src folder-> new -> Java Class -> Select Enum (and name it).

Task 8

Add a field to Book so that we have information about which genre a book belongs to.

Try creating a new book in the main method to see if genre also works.

Finished all the tasks? That's great! But, of course, there are always some extra tasks. They are a little harder...

Extra Task 1

Create a third class BookRegister. The class should have

- An array with space for a maximum of 20 books
- Method for entering a book in the register
- Information on how many books have been entered in the register
- A designer who creates the register in an appropriate way.

Create the registry in the main method and add some books.

Extra Task 2

Create some methods in the registry that can provide information about books in the registry that meet certain criteria. Example:

- All registered books.
- Books in a certain genre.
- Books written by a specific author.

Call on the methods from the main (after you have added some books) and check if the methods work satisfactorily.

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Hey, do you need even more?!? Oh well...

Create a Chapter class that holds information about

- Title of the chapter
- Number of pages
- Reading time per page

Expand the Book class so that it has an array that contains information about all the chapters in the book.

You can now offer several methods in the book register, such as: Give me books that have a reading time of less than a number of minutes.

It is also a bit cumbersome to use an array to hold in these books and chapters. But, but we will look at more appropriate ways later in the course 😊