

**Software Engineering**  
**MSc in Engineering in Computer Science**  
**Sapienza Università di Roma**  
*Programming test – Duration 150 mins*

---

The student is required to develop:

- A **micro-service BOOKServ**, exposing an **interface in GRPC**, which exposes data about Books. The features of a book are the title (a String), an author (represented as a String – we assume a single author for book), a year of publication (again represented as a String) and an ID (unique identifier). Please initialize the service with at least 10 books.

*In developing the service, please adopt all simplifications you may deem necessary, and adhere to the simple method(s) presented in classes and lab lessons. The exact design of the interface of the service is up-to-you.*

*It is required to use a simple database, and to create also a simple external Java program for creating and managing the database (as seen during the lab lessons).*

*The database should have two tables:*

*BOOKS (ID, title, year, authorID)*

*AUTHORS (authorID, name, yearOfBirth)*

*where authorID is a foreign key from BOOKS to AUTHORS (it allows to link the data of the author to his/her books)*

- A **micro-service WAREHOUSEServ**, exposing an **interface in SOAP**, which exposes commercial information about a Book. In particular, given the ID (unique identifier) of a book, it returns the price (real) of such a book, the list of Sellers for such a book and for each seller the estimated delivery date (a String in the format dd/mm/yyyy) in case of purchase. A seller is represented as a String (and we assume such strings are unique).

*In developing the service, please adopt all simplifications you may deem necessary, and adhere to the simple method(s) presented in classes and lab lessons. The exact design of the interface of the service is up-to-you. **It is important that the IDs used in the SOAP service are coherent with those ones of the GRPC service***

- a **simple client**, which *interactively*<sup>1</sup>:
  - allows the user to retrieve the list of all books,
  - allows the user to insert the ID of a book (assuming the client has previously read the list of available books) and shows all the details (including the name of the author and his/her year of birth, and the list of the sellers)
  - allows, given a seller (again assuming the client has previously read the list of sellers) to know the estimated delivery date of the given book by such a seller.

The assignment will be evaluated not only in terms of correctly executing, but also on the appropriateness of the services' interfaces given the above specifications and the correct respect of the user dialog as described above.

---

<sup>1</sup> Interactively means that the user can continuously ask for functionalities. It can be implemented either through a CLI (Command Line Interface) or a GUI (e.g., a Java Swing, a servlet, etc.) and this is not important, but the interactivity is crucial