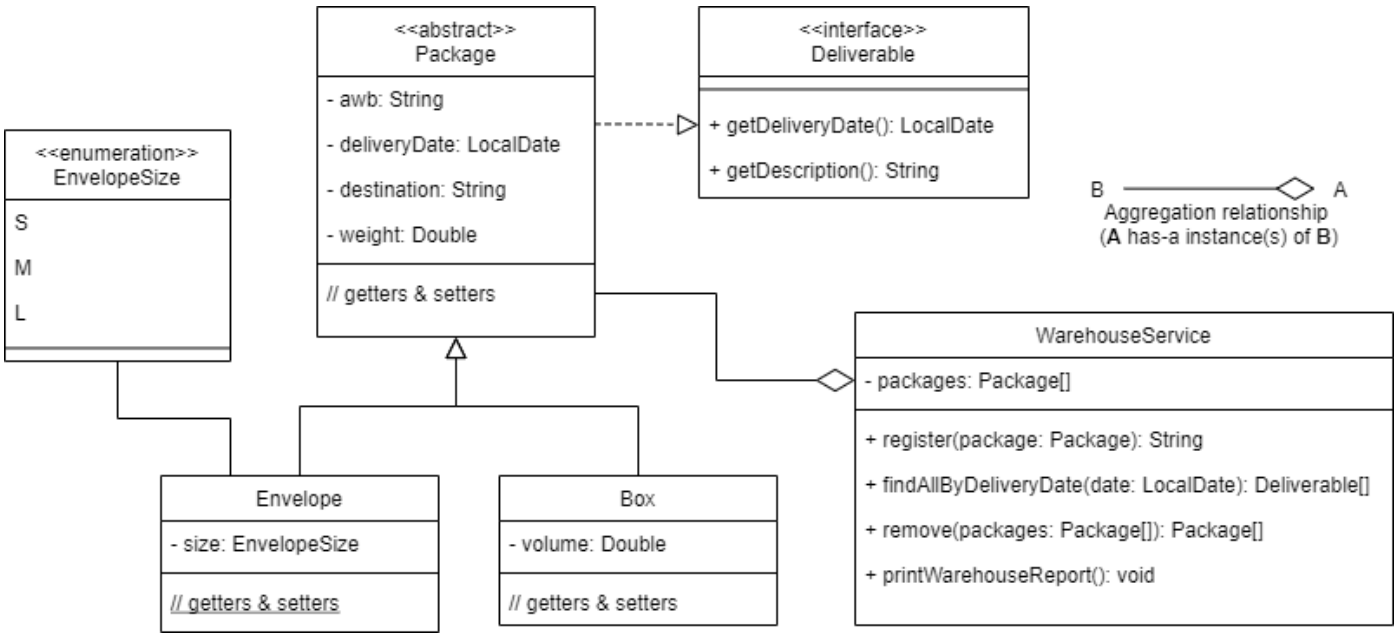
A. Packages

The application you'll have to build today represents a management application to be used inside a warehouse for packages management. There will be two types of packages to work with: `Envelope` and `Box`. The functionalities to be built includes package registration, package removal, filtering packages by delivery date and printing a warehouse report.

Figure 1: UML diagram



Requirements

1. Read and understand the UML diagram and then create the classes structure as presented in the diagram.

2. Implement the WarehouseService register & remove methods by taking into account the following guidelines:

- The `register` method must assign a unique `awb` string to each package before saving it to the `packages`. The same string will be returned on successful processing. The `packages` must be always sorted ascending by `deliveryDate` and then by `destination` (if 2 packages have same `deliveryDate`);
- If the package has an `awb` already set on registering then return the `'AWB already assigned'` message. If the package doesn't have a `deliveryDate` or `destination` set then return the `'Delivery date/Destination not set'` message;
- If there is no space left to store another package in the `packages` array then resize the array before storing the package successfully;
- The `remove` method must remove all the packages that are found (search by `awb`) from the `packages` class attribute;
- The `remove` method must return an array of the packages that were not found to be removed or an empty array otherwise.

3. Create a class called `Main` where you should provide the `main` static method. Create an instance of `WarehouseService` class and then create some instances of the other classes as follows:

- Create an instance of a `Box` and two instances of `Envelope`;
- Register them by using the `WarehouseService register` method;
- Use the `WarehouseService remove` method on one of the `Envelope` instances.

4. Implement the `findAllByDeliveryDate` method so that it returns an array of `Deliverable` objects that are to be delivered on a specific date. If the method parameter `date` is `null` then return the packages to be delivered today.

5. Implement the method `printWarehouseReport()` inside your `WarehouseService` class so that it displays the contents of the `packages` vector as shown in the next picture (or similar-meaning you might get a different format for the date for example). Order report ascending by delivery date and for every package display the `awb` and type (`BOX or ENVELOPE`) plus the extra info for each of the types. (use method overriding for this)

Figure 2: Warehouse report example

```
1  Packages report:
2  1. 12.08.2021 - 2 packages
3  AWB123 - BOX - volume 0.2 m^3
4  AWB234 - ENVELOPE - size S
5  2. 13.08.2021 - 1 package
6  AWB222 - BOX - volume 1 m^3
```

Note: Please consider leaving a feedback on todays' test over here: https://nqueries.com/poll/gVJNKV