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1 Classes

1.1 Pilot

`Pilot` is a class that is unique to our application. The current structure of the pilot class is as follows:

- **pilot_id**: Used to refer to each unique pilot.
- **allowed_to**: A list of `ShipTypes` that the pilot is permitted to board.

Other attributes for quality-of-life may include:

- **forename**: To output their name to the dashboard.
- **surname**: To output their name to the dashboard.

1.2 Tide

As harbourmasters, we are solely responsible for analysing the current tide conditions to judge whether or not it is safe to bring a ship into port. The structure of a `Tide` object is as follows:

- **tide_id**: A unique identifier for the tide.
- **until**: The time at which the current tide ends or changes height.
- **height**: The height of the tide.
- **type**: The `TideStage`; may not be needed.

1.2.1 Collection and Storage of Tide Data

Tide data will be stored in a simple MySQL database which is accessed via `TideDAO`. This concept applies to other classes, but it's important to focus on the tides specifically as it requires collection from an external source, i.e. the internet.

If possible, we would like to make use of a free API to get the most up-to-date tide information with little manual effort on our end. There are many APIs available, notably the one from admiralty.co.uk for all UK ports, though it is quite expensive. As finding a free API is quite difficult, we may have to suffice for either web-scraping tide information from public websites, or simply making up our values. Regardless of how the information is obtained, it will be stored in a way similar to how the object is structured. Example:

tide_id	until	height	type
74	2021-10-19 10:36	1.00	LOW
75	2021-10-19 13:36	4.39	HIGH

1.3 TideStage (Enumeration)

A very simply enumeration that stores what stage the current tide is considered.

- **LOW**: A low tide.
- **HIGH**: A high tide.

1.4 Ship

The design of the **Ship** class is to be agreed with the shipping line team. Currently, we have the following structure in mind:

- **ship_id**: A unique identifier for the ship.
- **type**: The type of ship, given by the enumeration 'ShipType'.
- **minimum_tide_height**: The minimum tide height that the ship can be safely brought in at.
- **maximum_tide_height**: The maximum tide height before it is deemed unsafe to be brought in and must wait.

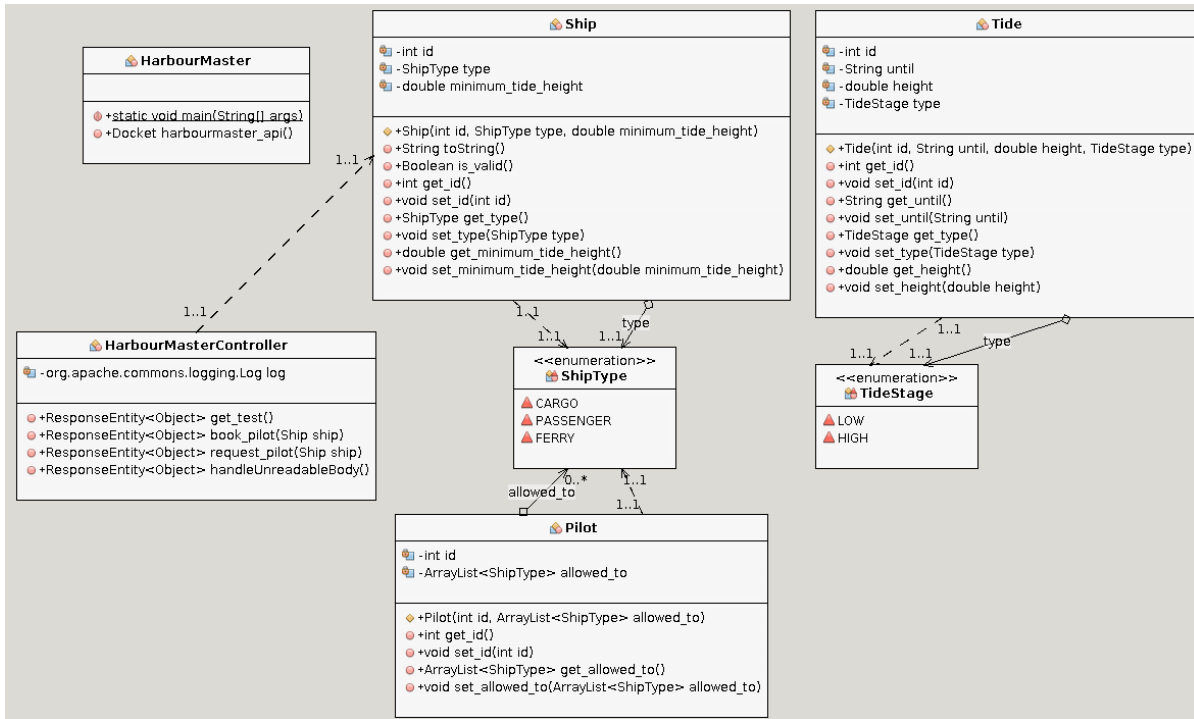
1.5 ShipType (Enumeration)

ShipType is not a class, but a simple enumeration. Similar to the **Ship** class, the design of this is also dependent on the shipping line team. We currently have:

- **PASSENGER**: A ship whose primary function is to carry out passenger on the sea.
- **FERRY**: Another type of passenger vessel.
- **CARGO**: A very large ship that carries cargo, goods, and materials from one port to another.

1.6 Class Diagram

The DAOs have not yet been added to our experimental project, hence the absence of them from the diagram.



2 Responsibilities

We are responsible for exposing the following REST endpoints:

2.1 /api/bookPilot (for the Shipping Line)

/api/bookPilot is an endpoint that is needed by the shipping line team to book a pilot to bring in the ship when they arrive at the port. This endpoint will take in a `DateTime` and `Ship` object. From here, our system will perform checks regarding time availability and ability to board the given ship. Once a list of suitable pilots has been accumulated, a random one will be chosen and their ID returned to the shipping line team where they will continue their role. If no pilots are available that clear these conditions, then an error message will be returned along with the next time that a pilot is available.

2.2 /api/requestPilot (for the Shipping Line)

/api/requestPilot is needed by the shipping line when the time comes for a pilot to be sent out and retrieve ships that have arrived to port.

3 Requirements from others