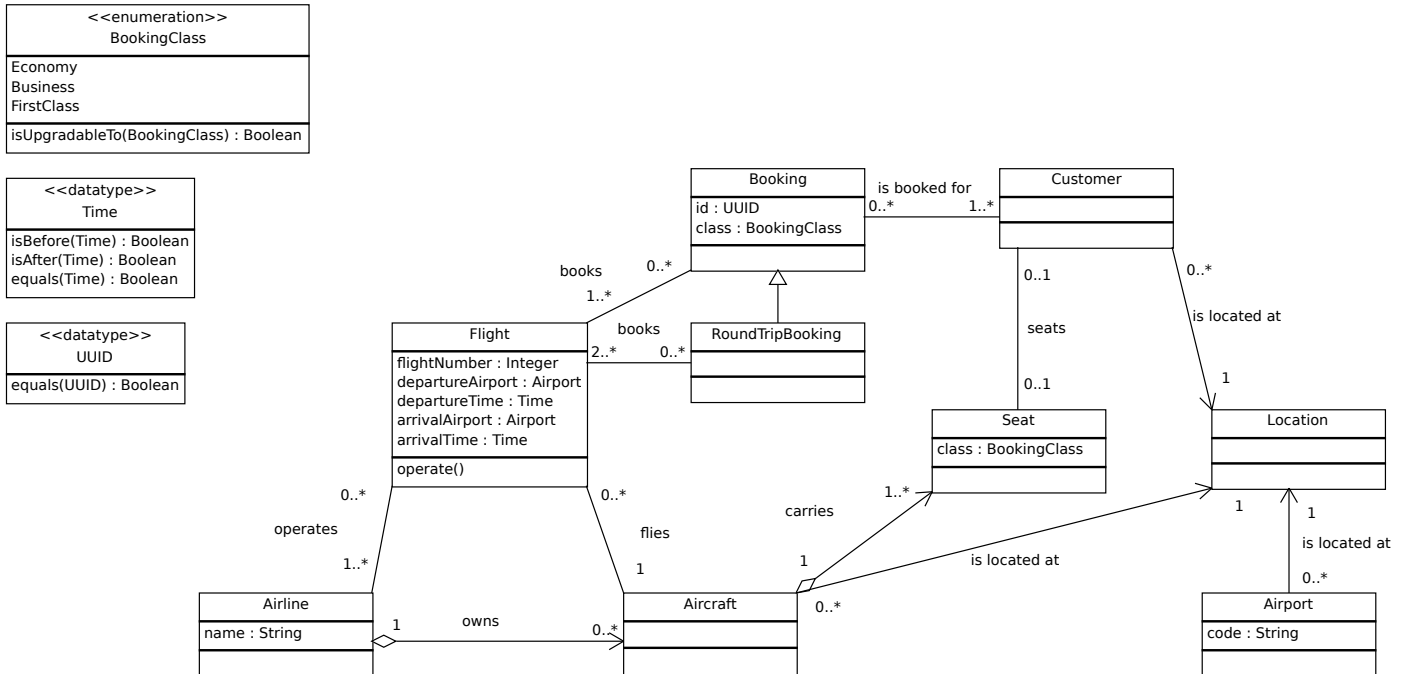# Project 1: Flight Booking System

1 UML Model

Figure 1: The UML model for the flight booking system

2 Additional Constraints

The following constraints are not expressible in the UML class diagram, but need to be upheld.

- Each `Flight`'s `departureAirport` and `arrivalAirport` must not match.

- Each subsequent `Flight`'s `departureAirport` in a `Booking` must match the preceding `Flight`'s `arrivalAirport`.

- Each `Flight` in a `Booking` must have a `departureTime` that `isBefore` its `arrivalTime`.

- Each subsequent `Flight`'s `departureTime` in a `Booking` `isAfter` the previous `Flight`'s `arrivalTime`.

- Each `Customer` associated with a `Booking` is tied to a `Seat` in each of the `Booking`'s `Flight`'s `Aircraft`, whose `class` either matches the `Booking`'s `class` or for which the `Booking`'s `class` `isUpgradableTo` the `Seat`'s `class`.

- `Economy` `isUpgradableTo` `Business` is true.

- `Business` `isUpgradableTo` `FirstClass` is true.

- Any other combination of `BookingClass`es with `isUpgradableTo` is false.

- A `Booking` may not be tied to the same `Customer` more than once.

- A `Customer` cannot be tied to a `Booking` whose `Flight`s' `departureTime` `isBefore` and `arrivalTime` `isAfter` the `departureTime` of a `Flight` from another `Booking` tied to the same customer.

- An `Aircraft` can only be tied to `Flight`s whose `departureTime`s and `arrivalTime`s do not intersect.

- In a `RoundTripBooking`, the first `Flight`'s `departureAirport` must match the last `Flight`'s `arrivalAirport`.

- The `id` of every `Booking` must not be `equal` to any other `Booking`'s.

- The `name` of every `Airline` must not be `equal` to any other `Airline`'s.

- The `code` of every `Airport` must not be `equal` to any other `Airport`'s.

- The `flightNumber` of every `Flight` must not be `equal` to any other `Flight`'s whose `departureTime`s and `arrivalTime`s overlap.

- The `Aircraft`'s `Location` must be equal to the current `Airport`'s `Location` whenever the `Aircraft` is not in flight.