A Trip on an Aeroplane

Earlier this year, I visited my hometown in Wales.

I chose the **dates** and **times** for my **flights**. I wanted to fly to Manchester Airport, but I also wanted to return to Cambodia two weeks later, so I bought a **return ticket**.

A ticket can have different **conditions** with different **prices**. For example, *Economy Classic* and *Economy Flex* will sit you in the same seat, but *Flex* allows refunds if you cancel, while *Classic* does not. This is called a "**fare basis**".

There are also **Business Class** tickets. These are special, big, expensive seats near the front of the plane. If I buy an Economy Class ticket, I cannot be given a Business Class seat.

Each **trip** had three flights, or "**legs**". There are no direct flights from Cambodia to the UK, so I changed planes in Singapore and Helsinki.

Flights have a **flight number**. My flight to Singapore was on flight number AY6404. The same flight number will be used for the same **route** on different days, but it doesn't always use the same exact aeroplane.

Aeroplanes have **registration numbers** like "OH-LWP". These aren't printed on the **ticket**, but different aeroplanes sometimes have different **layouts**, which means different **seat** numbers.

I selected what kind of **meal** I wanted. Some passengers have special requirements such as vegetarian, vegan, dairy-free, Halal, Kosher and so forth, but I'll eat anything. We must choose in advance so that the airline knows which special meals to **load** onto the plane.

I added my **Frequent Flyer** membership number. This is like a member points card, which gives me award points or "air miles" that I can spend on buying discount flights in the future.

After paying with my **credit card,** I received a ticket with a **Booking Reference Number**. This reference number covers both the flights to Manchester and the return flights back to Cambodia.

A few weeks later…

I went to the **airport** and checked in. The **airline** noted that I was **Checked In** and assigned me **seat numbers** for each of the three flights.

They attached printed labels (or **tags**) to my bags. These tags showed the list of all the airports and flights my bags should go to. The airports all have **three-letter codes**, for example Phnom Penh is **PNH**.

They also gave me three **boarding passes**, one for each separate flight of the trip.

To board the flight, I had to walk to the right **gate** where the plane was parked. An airport has lots of gates. At Phnom Penh Airport, the gates are numbered 1-21. A bigger airport might have a letter too, for example "D23".

The ground crew loaded my bags into the **cargo hold** of the plane.

When I was **boarding** the flight, the **attendant** scanned my **boarding pass** to tell the system that I was on the plane (or **boarded**). The attendants are **employees** of the airline, along with the **pilot** and **co-pilot**. It's important for a flight to have a full **crew** scheduled on it.

When my flight landed in Singapore, the **baggage handlers** had to be very fast to find and unload my bag from the cargo hold of the aeroplane and put it on the next flight to Helsinki!

I got off the plane and went to the **gate** for the onward flight to Helsinki Airport. I scanned my second boarding pass and boarded. Only one more flight to go!

Assignment

1. Make a list of the entities described in the story.
2. Construct the UML to describe all the entities in the above story.
3. Create the OOP classes to handle the entities and their relations.
4. Within your classes, write functions that will help with the user stories below.
   You do **not** need to implement a front-end, form validation or permission checking for these!
   You only need a working function that takes an input and returns an output, e.g.

Example of methods:

On company :
```
getFlights(pilot : Pilot, date : Date) : Flight[]
```

On Airport :
```
getGateNumber(flightNumber : string, date : Date) : string
```

User Stories

1. As an airport controller, I need to get the full details of a passenger's trip from their Booking Reference Number *(flights, bags, customer information…)*

2. As an airline manager, I want to know for a given flight, how many passengers were booking return tickets.

3. As an airline pilot, I want to know, for a given date, how many flights I have to join.

4. As an airline chef, I need to know, for a given flight, how many of each meal type I need to prepare.

5. As an airline manager, I want to find out how much salary I pay all my employees.

6. As a passenger, I want to know which gate my plane is waiting at.