Docking Feature Breakdown

Overview

The ISS has 8 Docks that shuttles can dock at. Astronauts and resources can be sent between earth and the space station using these docks.

Classes

Classes involved:

- **Shuttle**
- **Space station (has an inventory)**
- **Dock**
- **Astronaut**
- **Ground staff**
- **Resources**

States

Each **dock** will be numbered from 1-8 and can be in one of three states:

- **'occupied'**
- **'assigned-but-empty'**
- **'un-assigned'.**

A **shuttle** can be in one of the states:

- **'on-the-ground'**
- **'travelling'**
- **'docked'.**

Behavior

There will be a fixed number of **shuttles** registered with the system, each with a unique ID.

The **ground staff** can add **resources** or **astronauts** (only if they are on the ground) to a **shuttle** when it is **'on-the-ground'**. When a **shuttle** is in **'on-the-ground'** the **ground control** users can specify a **dock** for it to fly to. The **ground control** can only specify a **dock** if the

dock is in the state, **'un-assigned'** (to avoid collisions). Upon a **shuttle** being assigned **to** a **dock** the **docks** state becomes **'assigned-but-empty'**.

When the **shuttle** docks at the **space station** the **resources** from the **shuttle** are automatically transferred into the space stations **inventory** and the **dock** state changes to **'occupied'**. The **shuttles** state becomes **'docked'**.

When the shuttle is in the **'docked'** state **ground control** can add **astronauts** or **resources** to the **shuttle** (from the **ISS's inventory**). **Ground control** can then launch the **shuttle** back to earth.

When on the **shuttle** the astronauts cannot use the system.

When the **shuttle** is **'travelling'** it cannot be assigned a new destination.

There is a limit to how many **astronauts** can be on the space station at any one time. Ground control cannot add more **astronauts** to a shuttle on the ground than there are free spaces on the **space station**.

Notes:

- My modeling simplifies the process so that people and resources are immediately modeled as being in the location they are assigned. As we will not have real resources moving about, I think this is for the best.
- There are no specific docks for on earth, only the space station.