**Use Case Narratives:**

* **Login –** A user has unique details to login. Once they log in the system will find previous route history to make suggestions on stations to travel between.
* **Input values –** This is when a user chooses specific stations and times. It includes selecting the departure station and selecting the destination station. The user must also select a departure time and has the option of selecting an arrival time.
* **Calculate routes –** The inputted stations and times are then used to find all routes between the stations.
* **Calculate shortest route –** An algorithm then calculates the shortest of these routes which coincides with the given time(s).
* **Confirm route –** The user must then confirm the available route so that it can be added to their route history for future travelling.
* **View timetable –** The user can also just simply view the times that trains arrive at specific stations.
* **Update train routes –** Admin can update train routes or schedules whenever these change. These updates must reflect in the database afterwards.

**Typical course of events**

|  |  |
| --- | --- |
| **Actor Action** | **System Response** |
| 1. User logs in | 1. Retrieve unique route history and suggest stations |
| 1. User chooses departure station | 1. Verifies station |
| 1. User chooses destination station | 1. Verifies station |
| 1. User chooses departure time (and possibly arrival time) | 1. Finds all routes that fit the given inputs 2. Calculate and return shortest route |
| 1. Confirm shortest path | 1. Add route to history |

**Alternative flows**

|  |  |
| --- | --- |
| **Actor Action** | **System Response** |
| 1. User chooses invalid departure station. | Returns error of invalid station and prompts valid station (back to step 1) |
| 1. User chooses times which are unrealistic/unachievable | Returns error of unachievable times and prompts user for new times (back to step 6) |
| 1. User chooses invalid destination station | Returns error of invalid station and prompts valid station (back to step 4) |
|  |  |

**Analysis Class Diagram**

There are only a few railway lines which all include several stations. Some of these stations may be apart of more than one line – this is where a transfer could occur. Each line also has a few trains which run daily on specific schedules. Users interact with the web interface (system) by inputting the required information, as well as optional additional information. The interface will then calculate the shortest route between two stations and return a list of trains (with times) which achieve this shortest route. Admins can edit the train schedules through the system.