

**Team 000000000111**

**Airport Map**

**Written Requirements**

***Revision History***

| <b>Authors</b>     | <b>Description of Change</b>       | <b>Sections</b> | <b>Rev</b> | <b>Date</b> |
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| Lola H.            | Added basic terminology.           | 2               | 1          | 2/27/2018   |
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| Lola               | Overview made more concise         | 1.1             | 3          | 3/22/2018   |

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## Team Description

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## Terminology

The following table defines terms used within this document.

| Term    | Definition   |
|---------|--|
| Vertex  | An object that is connected by edges.  |
| Edge    | A line directly linking any two vertices. An edge starts at vertex A and ends at vertex B.   |
| Path    | A network of one or more edges that links two specific vertices.   |
| Airline | Main customer of the software; based on certain use cases, the airline alternates between primary actor and secondary actor.   |
| FAA     | Regulator of the software, can directly modify any flight's path data.   |
| Airport | The airline's representation of a vertex. Flight paths can only be made between two airports. Airports are regulated by the FAA, which allows airlines to use the airport. |

## Airport Map

### 1.1 Overview

The Airport Map Program will have the following functions:

- Create empty airport map
- Create Airport
- Create Edge
- Remove Airport
- Remove Edge
- Disable Airport
- Disable Edge
- Generate a path between two airports

Once the map is created, airports are added to the map. Edges are added to connect two airports together or connect a series of airports. A combination of edges connecting several airports in a series is a flight path. The airline selects one airport to be the starting point and one airport to be the ending point. The system computes the path with the shortest distance between the two airports. The system saves this path in the database for future access. The FAA can add, remove, or disable any path, edge, or airport on the map. If an airport is removed from either the map or a saved path, the system removes all edges connected to the affected airport, and an alert will be displayed to the airline with relevant details. If an airport is temporarily disabled on either the map or a saved path, an alert will be displayed to the airline and the system recomputes a new path with alternate edges. If an initial airport is removed or disabled, an alert will be displayed to the airline, and the system will delete affected paths.

#### 1.1.1 Create elements for map

The FAA user **shall** add airports and edges to the map, which will initially be empty.

##### 1.1.1.1 Create an airport

The FAA **shall** create a new airport. The FAA **shall** input the coordinates, name and location of the airport. The system **shall** test to see if the airport is already on the map before finalizing the airport as a new vertex.

#### 1.1.1.2 Create an edge

The FAA **shall** create an edge between two valid vertices. A valid vertex is an airport recognized as a legitimate airport by the FAA. The FAA **shall** input the coordinates (x,y) of each airport and the flight distance in miles.

### 1.1.2 Remove elements from the map

The FAA user **shall** remove airports and edges from the map when an airport or edge is deleted or canceled.

#### 1.1.2.1 Delete an airport

The FAA **shall** have the capability to remove an airport from the map permanently. The FAA will choose from a list of airports and select the one for deletion. The system **shall** then delete the airport and any connecting edges. The system **shall** also alert airlines with affected paths

#### 1.1.2.2 Delete an edge

The FAA **shall** have the capability to remove an edge from the map permanently. The FAA **shall** choose the airports with the connecting edge. The system **shall** check if there is an edge at this location. The edge **shall** be deleted and any airline with an affected path will be alerted.

#### 1.1.2.3 Cancel an airport

The FAA **shall** have the capability to remove an airport from the map for a period of time. The FAA **shall** choose from a list of airports, and input a time frame for cancellation. The system **shall** disable the airport and will alert any airline with an affected path.

#### 1.1.2.4 Cancel an edge

The FAA **shall** have the capability to remove an edge from the map for a period of time. The FAA **shall** choose the airports with the connecting edge and input a time frame for cancellation. The system **shall** disable the edge and will alert any airline with an affected path.

### 1.1.3 Generate a path between two airports

The Airline user **shall** select a starting airport and an ending airport for the system to generate the path. The user can then choose to save the path.

1.1.3.1 Generate Path

The airline **shall** select a starting airport and an ending airport. With this information the system **shall** then calculate the shortest path of connecting edges from the start to end point.

1.1.3.2 Save Path

The airline **shall** have the option to save the path with a departure time.