Team 000000000111

Airport Map

Use Case Report

Revision History

Authors	Description of Change	Sections	Rev	Date
Matthew Noack	Changed the Detailed Description and Statement of Purpose	2	2	2/27/18
Christine Trujillo	Added page breaks and resized images to fit on pages better.	1-2.1	2	2/27/18
Christine Trujillo	Saved as a new document and deleted sections 2.2.1 to end	2.2.1 - end	2	2/27/18
Christine Trujillo	Added #1- 3 in use-case/ scenario list copied from previous template and formatted correctly *Left unfinished needs #3-9	2.2.1- 2.2.3	2	2/27/18
Christine Trujillo	Added #3-9 in use-case/ scenario list copied from previous template and formatted correctly	2.2.3 - 2.2.9.1	2	2/27/18

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1 Team Description

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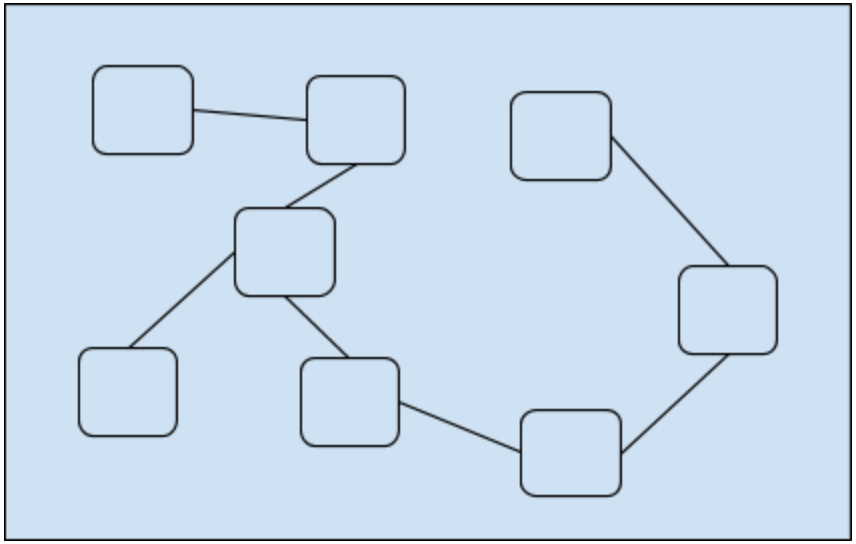
2 Project Description

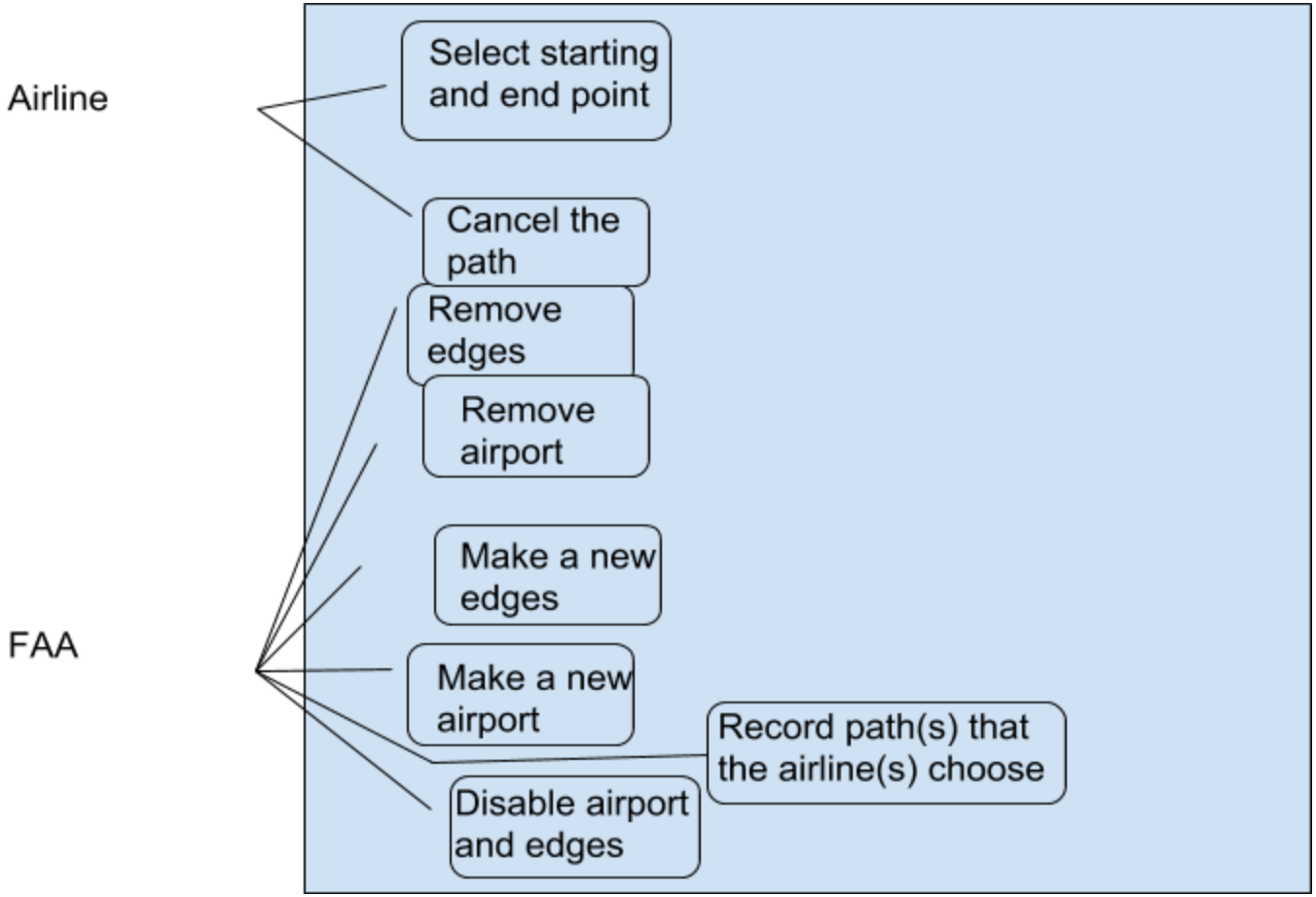
Statement of Purpose: The purpose of this project is to determine the optimal flight path based on distance between two airports.

Detailed Description: Each rectangle is a vertex, an indivisible object that are connected by edges, and each vertex represents a airport. Each line between two airports are called an edge, and the set of edges that connect a starting point and ending point is called a path. The program will generate a map based on the number of vertices and edges created by the FAA(It will look like the following drawing).



The airline enters a starting point and ending point for the path. First, the system will determine if the path is possible. If the path is possible, the system will generate the shortest path for the airline based on distance. If not, the system will generate an error message. If the airline selects a generated path. The FAA will then record said path selected by the airline. The FAA can remove airports and paths at anytime.

2.1 Use Case Diagram



2.2 Use Case List

Use Case		
Sequence Number	**Actor**	**Goal**
1	Airline	Select starting and end point
2	Airline	Cancel Path
3	FAA	Record path(s) that the airline(s) choose
4	FAA	Create edge
5	FAA	Create airport
6	FAA	Remove edge
7	FAA	Remove airport
8	FAA	Disable airport
9	FAA	Disable edge

2.2.1 Select starting and end point

Primary Actor:Airline

Secondary Actors(s): FAA

Goal in Context: From the map the Airline will select the start and end point.

Preconditions: Airports will be set up by FAA.

Additional Description: The total distance between the starting point and the ending point (including airports in-between the start and end points) will be calculated by the system to provide the shortest path the airline can take. An edge leading directly from the start point to the end point will be prioritized first. Paths separating the start and end points by one or more airports will be used in the event that a direct edge is unavailable to be made between the two points.

2.2.1.1 There is a path between airports

The system then displays a path with the shortest path between the chosen airports. The Airline can choose said path. If said path is chosen, it is saved in a database.

2.2.1.2 There is no path between airports

Airline will be alerted that there are no possible paths between airports.

2.2.2 Cancel Path

Primary Actor:Airline

Secondary Actors(s): FAA

Goal in Context: An airline can cancel a saved path.

Preconditions: Airline must first have paths saved. Cancellations may be forced by FAA.

Additional Description: Paths saved by the Airline can be cancelled either by choice from the Airline or by force from the FAA.

2.2.2.1 Airline chooses to cancel a path

The airline can look at current flight paths and choose to delete one. Saved path is deleted.

2.2.2.2 Airline is forced to cancel a path

In the case of an airport or edge is disabled along a saved path the airline will be alerted and given the option to choose a new path.

2.2.3 Record paths that the airline chooses

Primary Actor: FAA

Secondary Actors(s): Airline

Goal in Context: To manage flight map.

Preconditions: All information is gathered from real life data.

Additional Description:

2.2.3.1 Path is created and recorded with departure time.

2.2.4 Create Airport

Primary Actor: FAA

Secondary Actors(s): Airline

Goal in Context: The FAA will input coordinates for new airports.

Preconditions: All information is gathered from real life data.

Additional Description:

2.2.4.1 The coordinate is accepted and the airline is added to the map

2.2.4.2 The coordinate is outside of the U.S. and an error message is displayed.

2.2.4.3 The coordinate is already in use and an error message is displayed.

2.2.5 Create Edge

Primary Actor: FAA

Secondary Actors(s): Airline

Goal in Context: The FAA will select the connecting airports to add an edge.

Preconditions: All information is gathered from real life data.

Additional Description: This is done if there is a new connecting flight from one airport to another.

2.2.5.1 The edge does not already exist and is now added to the map.

2.2.5.2 The edge does already exist and an error message is displayed.

2.2.6 Remove Airport

Primary Actor: FAA

Secondary Actors(s): Airline

Goal in Context: The FAA will select an airport to delete.

Preconditions: All information is gathered from real life data.

Additional Description: The system will also delete edges connected to this airport. Before deletion the system will check if deleting any of the edges will lead to an abandoned airport. (Abandoned Airport- an airport without any edges)

2.2.6.1 No abandoned airports will be created by deletions, so the the airport and edges are deleted
2.2.6.2 Deletion will result in an abandoned airport, so a warning message is shown [Delete anyway? Yes/No]
2.2.6.2.1 No selected: System will not delete
2.2.6.2.2 Yes selected: The airports and edges are deleted and a message will ask if the abandoned airport is to be deleted

2.2.7 Remove Edge

Primary Actor: FAA

Secondary Actors(s): Airline

Goal in Context: The FAA will select an edge to delete.

Preconditions: All information is gathered from real life data.

Additional Description: The system will check if the deletion will result in an abandoned airport. (Abandoned Airport- an airport without any edges)

2.2.7.1 The airports connected by this edge will still have other edges so the selected edge is deleted
2.2.7.2 At least one of the airports connected by the edge will be left without any edges, so a warning message is displayed showing that there will be no possible flights to or from the airport.

2.2.8 Disable Airport

Primary Actor: FAA

Secondary Actors(s): Airline

Goal in Context: The FAA will select an airport to disable for a set amount of time.

Preconditions: All information is gathered from real life data.

Additional Description: The system will check if there are any saved paths that go through the airport. The airport will now display as disabled and will not be available to paths

2.2.8.1 If an airport is part of a path than the airline(s)will be alerted and said path will be deleted from the database.

2.2.9 Disable Edge

Primary Actor: FAA

Secondary Actors(s): Airline

Goal in Context: The FAA will select an edge to disable for a set amount of time.

Preconditions: All information is gathered from real life data.

Additional Description: The system will check if there are any saved paths that go through the edge. The edge will now display as disabled and will not be available to paths

2.2.9.1 If the edge is part of a path than the airline(s) will be alerted that their path is canceled and the path will be deleted from the database.