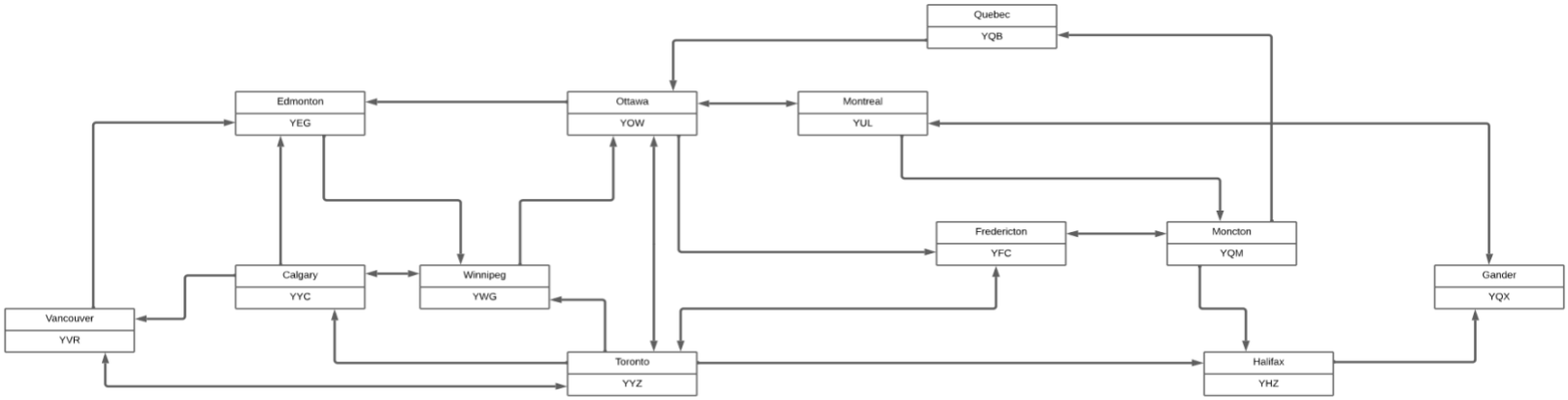
Test Document

Map



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Removing Connected Airports

Description

This test will make sure after removing Toronto it does not show up on the list of airports or destinations from any other airport. Vancouver normally goes to both Edmonton and Toronto however Toronto has been removed from the AirportList

Expected output

Vancouver airport's code is YVR and its destinations are Edmonton

Actual output

```
Enter a command >> v
what is the code of the airport?
YVR
Vancouver airport's code is YVR and its destinations are:  Edmonton
```

Fastest Route

Description

There are multiple ways to get from Moncton to Ottawa, the fastest way is to go to Quebec and then Ottawa. This test will try and use the ShortestPath method to figure that out

Expected output

Shortest path found. From Moncton to Ottawa the path is: Moncton -> Quebec -> Ottawa

Actual output

```
Enter a command >> S
What is the origin airports Code?
YQM
What is the dest airport code?
YOW
Shortest path found. From Moncton to Ottawa the path is: Moncton -> Quebec -> Ottawa
The distance of the path is 2
```

No Possible Route

Description

Russia (RUS) was added to the map using the AddAirport function, however no flight paths have been connected to it. This test will check if ShortestPath function can tell if there are no available routs without crashing.

Expected output

There is no path between nodes: Toronto and Russia

Actual output

```
Enter a command >> S
What is the origin airports Code?
YYZ
What is the dest airport code?
RUS
There is no path between nodes: Toronto and Russia
```

Invalid airport codes

Description

This test will make sure no functions accept/try to work with airport codes that do not exist

Expected output

Airport not found

Airport not found

Airport not found

Airport not found

Airport not found

Actual output

```
Enter a command >> D
What is the airport's code?
ABC
airport not found
```

```
Enter a command >> R
What is the origin airports Code?
ABC
What is the dest airport code?
XYZ
airport not found
```

```
Enter a command >> U
What is the origin airports Code?
ABC
What is the dest airport code?
XYZ
airport not found
```

```
Enter a command >> S
What is the origin airports Code?
ABC
What is the dest airport code?
XYZ
airport not found
```

```
Enter a command >> V
what is the code of the airport?
ABC
airport not found
```

Removing a route that does not exist

Description

This test will try and remove a flight path that does not exist

Expected output

Failed to remove route

Actual output

```
Enter a command >> U
What is the origin airports Code?
YEG
What is the dest airport code?
YFC
Failed to remove route
```

Flying to the same location

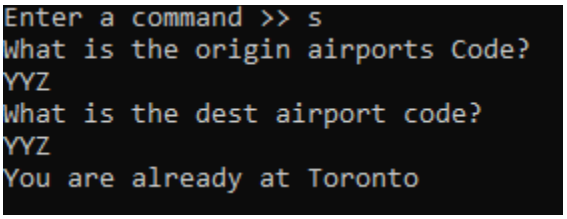
Description

This test will see what happens when you use the ShortestRoute function to go from one airport to the same airport (Toronto to Toronto).

Expected output

You are already at Toronto

Actual output



Duplicate flight Path

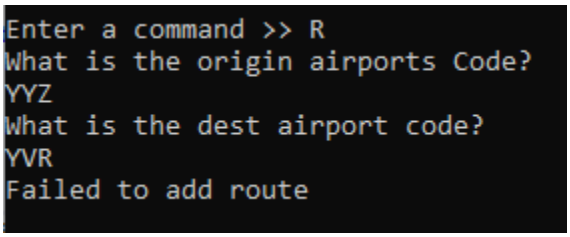
Description

Test will attempt to duplicate a flight path.

Expected output

Failed to add route

Actual output



Duplicate airports

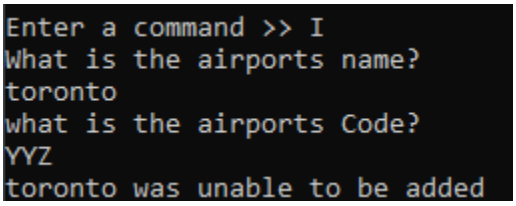
Description

Test will attempt to duplicate Toronto

Expected output

Toronto was unable to be added

Actual output



Updating shortest path (Also routes and airports updating)

Description

Test that when edges are added or removed, the shortest path algorithm updates accordingly

Also demonstrates that the add/insert/create and remove route and remove Airport work properly and in conjunction with the shortest path method

Also demonstrates that the add/insert/create and remove route and Airport work properly and in conjunction with the shortest path method

Also demonstrates the shortest path method outputs the correct path length (number of flights)

Also shows that when either destination or origin don't exist, program continues

Input

Shortest distance between Vancouver and Quebec

Remove Toronto

Add Kingston between Vancouver and Fredericton

Remove Kingston

Fastest route between Vancouver and ABC123 (doesn't exist)

Fastest route between ABC123 and Quebec (doesn't exist)

Add ABC123 route with destination Quebec

Shortest path between ABC123 and Quebec

Expected output (first test)

Vancouver > Toronto > Fredericton > Moncton > Quebec

Expected output (add Kingston between Moncton and Quebec)

Vancouver > Edmonton > Winnipeg > Ottawa > Fredericton > Moncton > Quebec

Expected output (remove Moncton)

Vancouver > Toronto > Fredericton > Kingston > Quebec

Expected output (remove Kingston)

Vancouver > Edmonton > Winnipeg > Ottawa > Fredericton > Moncton > Quebec

Expected output (non existing airport origin)

Airport does not exist

Expected output (non existing airport destination)

Airport does not exist

Expected output (Add airport ABC123 and route to Quebec)

ABC123 > Quebec

Path length is 1

Actual output (test 1)

```
Enter a command >> s
What is the origin airports Code?
YVR
What is the dest airport code?
YQB
Shortest path found. From Vancouver to Quebec the path is: Vancouver -> Toronto -> Fredericton -> Moncton -> Quebec
The distance of the path is 4
```

Actual output (test 2)

```
Enter a command >> u
What is the origin airports Code?
YVR
What is the dest airport code?
YYZ
Route removed successfully



Command list:
I = Insert an airprot
D = Remove an airport
R = Create a route
U = Remove a route
S = find shortest path between airports
V = view airport details
E = exit program

Enter a command >> s
What is the origin airports Code?
YVR
What is the dest airport code?
YQB
Shortest path found. From Vancouver to Quebec the path is: Vancouver -> Edmonton -> Winnipeg -> Ottawa -> Fredericton -> Moncton -> Quebec
The distance of the path is 6
```

Actual output (test 3)

```
Enter a command >> r
What is the origin airports Code?
YGK
What is the dest airport code?
YFC
Route added successfully



Command list:
I = Insert an airprot
D = Remove an airport
R = Create a route
U = Remove a route
S = find shortest path between airports
V = view airport details
E = exit program

Enter a command >> s
What is the origin airports Code?
YVR
What is the dest airport code?
YQB
Shortest path found. From Vancouver to Quebec the path is: Vancouver -> Kingston -> Fredericton -> Moncton -> Quebec
The distance of the path is 4
```

Actual output (test 4)

```
Enter a command >> d
What is the airport's code?
YGK
Airport removed



Command list:
I = Insert an airprot
D = Remove an airport
R = Create a route
U = Remove a route
S = find shortest path between airports
V = view airport details
E = exit program

Enter a command >> s
What is the origin airports Code?
YVR
What is the dest airport code?
YQB
Shortest path found. From Vancouver to Quebec the path is: Vancouver -> Edmonton -> Winnipeg -> Ottawa -> Fredericton -> Moncton -> Quebec
The distance of the path is 6
```

Actual output (test 5)

```
Enter a command >> s
What is the origin airports Code?
YVR
What is the dest airport code?
ABC123
airport not found
```

Actual output (test 6)

```
Enter a command >> s
What is the origin airports Code?
ABC123
What is the dest airport code?
YQB
airport not found
```

Test on next page

Actual output (test 7 and 8)

```
Enter a command >> r
What is the origin airports Code?
ABC123
What is the dest airport code?
YQB
Route added successfully



Command list:
I = Insert an airprot
D = Remove an airport
R = Create a route
U = Remove a route
S = find shortest path between airports
V = view airport details
E = exit program

Enter a command >> s
What is the origin airports Code?
ABC123
What is the dest airport code?
YQB
Shortest path found. From ABC123 to Quebec the path is: ABC123 -> Quebec
The distance of the path is 1
```