The prospect report that you have requested regarding the airline merger is detailed below:

This report will represent the two airlines as graphs, where nodes are represented as flight routes or airports.

As seen in the leftmost image, flight nodes (1, 2, 3, 4, 5) and station nodes (n + 1, n + 2, n + 3) are interconnected with one another, symbolizing the possible flights.

The center image shows larger nodes (CPH, OSL, AAR, WAV) connected to the smaller nodes (11, 12, 13, 21, etc.).

Every line between the nodes is known as an *edge* (flight)*.* By merging the airlines together, we increase the number of nodes (airports) total, as well as adding more edges, increasing connectivity between airports.

Each edge can be labeled with the flight times from one airport to another, and using Dijkstra’s shortest path algorithm, we can then find a quantitative answer to whether or not travel times are reduced.

Unfortunately, no travel times between airports have between airports, so it would be difficult to implement Dijkstra’s algorithm in this method.

As an alternative, we could instead use Dijkstra’s algorithm to find efficiencies by analyzing the number of connecting flights (edges) between airports. For example, the flight from WAV to 22, to 14, and finally to OSL, can be seen as inefficient for someone who want to go straight from WAV to OSL. With the merging of the two airlines, it might be possible to reallocate resources to the newly acquired airports to instead send the flights to other airports, which would make a flight from WAV straight to OSL possible. The algorithm can be used to find these efficiencies.

Merging the airlines presents us with an opportunity for increasing possible flight paths and reducing travel times of future and existing flights. Geographical coverage will be expanded, providing access to stations which prior to a merger, were unavailable. Although the precise travel times are unfortunately unavailable, based on what can be estimated, it is reasonable to assume that the merger will be beneficial to us.

- Kacper Zalewski