Project Proposal

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March 22, 2018

1 Background

We are living in the global world. We can travel any countries or cities simply by taking airplanes. According to the Federal Aviation Administration, 2,587,000 passengers fly everyday in and out of U.S airports. [1] It's a large number of people. Since lots of people are using flights, there are many websites and programs that help us find cheap flight tickets. For example, when you search your starting place to destination on Google, it will show the lists of cheap flight tickets. We can see that the price are all different depending on the kind of airline, how many layovers there exist, which date it is used and some other factors. ITA Software [2] have a software for the travel industry. Some of the website, such as Orbitz, America West, Alaska Airlines use their search engines. ITA software said that it is really difficult to answer the question of specific set of flights for each part of the trip and a price. So in the project, I would find out the better method that ITA software use so that the data can be found more precisely.

2 Research Problem

Basically, I will work on how to find the cheapest flight ticket by using TSP(Traveling Salesman Problem) method and CSP(Constraint Satisfaction Problem).

3 Technical Approach

I will approach this problem by using TSP(Traveling Salesman Problem) in many different ways. For example, TSP with greedy algorithm, genetic algorithm and so on. The goal of this problem is to find the cheapest route. The node will indicate cities and the distance will be price. Also, it might be helpful to use CSP(Constraint Satisfaction Problem). The cost of the flight would be treated as constraints of CSP and it can reduce the paths by limiting conditions to get the solution. By using these methods, I will design a relevant algorithm to find the cheap flight tickets.

4   Milestones

All of the information and sources would be gathered by April 19th as Writing 5. The program I need for this project and some of the reference papers or Technical reports would be gathered until mid of April so that I can work on analyzing and selecting useful data. Also, by end of April, all of the data will be collected and analyzed by using the proper programs. There would be few experiments and output of comparable data are expected. Finally, the final project report by organizing the data I used and collected will be done by May 3rd which is the due date for the paper. In the final report, analyzing and conclusion would be included. The work would be done alone.

References

[1] Federal Aviation Administration. Air traffic by the numbers, 2017. Available online at https://www.faa.gov/air_traffic/by_the_numbers/.

[2] C. de Marcken. Computational complexity of air travel planning. Technical report, ITA Software, 2003.