

COMP 567: Proposal

Problem Description:

I am planning a bike trip across Canada. I have a list of potential destinations and I have given each one a rank to indicate how much I would like to include it on my trip. I have divided the map of Canada into a list of regions each with a given level of difficulty to bike through: 1(easy), 2(moderate) and 3(streuous). There are also regions which are not suitable for biking at all. For each region I have estimated how many kilometres per hour I can bike in that region. If I choose to I can use another method of transportation between destinations (plane, train or ship) but I can only spend at most a tenth of my entire time on alternate transportations methods. My goal is to find a route that maximizes my enjoyment of the trip while satisfying all my constraints. My enjoyment is calculated as the sum of the ranks of all the destinations that I end up visiting.

Constraints:

- The total time available for the trip is 12 weeks
- Time travelling between locations by other means of transportation than bike should be at most 10 percent of total trip
- I must visit at least 5 of the top 10 ranked destinations
- The trip must start in Whitehorse, Yukon and end in St. Johns, Newfoundland
- I cannot ride more than 7 hours per day through region with difficulty level 1, 6 hours for difficulty level 2 and 5 hours for difficulty level 3
- There are certain regions that I cannot bike through at all
- I need at least a full day of rest (no biking) per week
- I have a fixed budget for overnight accommodations and alternate transportation
- I cannot ride during the night and must spend each night in a hotel

Data available:

- List of destinations ranked in order of preference
- Price and time required for other types of transportation
- Price of overnight accommodation for all different regions (i.e. more expensive in big cities than small towns)
- List of regions each with level of difficulty to bike through from 1 to 3 and speed that I can bike though them (kilometres/hour)
- List of regions that I cannot bike through