

1. specifications

You're planning to drive from Boston to Seattle on I-90 this summer, and have a GPS programmed with the locations of gas stations along the way. Assuming that your car can go 400 miles on a tank of gas, determine where you should stop for gas in order to make as few stops as possible.

input: location of gas stations

output: which gas stations we stop at

legal solution: gas stations not more than 400 miles apart

optimization goal: fewest number of stops

2. examples

3. targets

4. tactics

5. approaches

subset

process input – for each gas station, do we stop there?

produce output – repeatedly find the next gas station to stop at

greedy choice

a) greedy strategies

process input – stop at the current station only if we can't make it to the next

produce output – the next stop is the farthest-ahead station we can reach

in both cases, the rationale is that going as far as possible between stops is good for reducing the number of stops

b) counterexamples

6. main steps

7. exit condition

8. setup

9. wrapup

10. special cases

11. algorithm

12.termination

a) measure of progress

b) making progress

c) reaching the end

13.correctness

a) loop invariant

b) establish the loop invariant

c) maintain the loop invariant

d) final answer

14.implementation

15.time and space