CS110: Computer Programming Lab
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Module 01 Stage 02 Exercise 07

Please read Module 01 Stage 02 Practice Exercises before you read further in this document.

Problem description

A smart city has adopted a scheme where each house is addressed by its x and y coordinate values.

A milkman leaves his house at coordinate (100.3, 20.5) and delivers dairy items to 3 houses before returning home. The houses were visited in the following order (120.1, 25), (130, 49.1), and (80.9, 80.0).

Write a program that reads the coordinates of his house and 3 houses in order they are visited. The program must print the total distance travelled by the milkman when he reaches home after the deliveries. Also, compute and print the maximum and minimum x coordinate value visited by the milkman.

All roads in the city are parallel to one of the two axes and intersect each other exactly at 90^o.

Guiding instructions

In solving this problem, you need to determine the variables of interest. Obviously, these are the distance travelled, maximum coordinate visited and the minimum coordinate visited.

This pattern is very common. The pattern has an initialization step. The initialization step is followed by a series of update steps.

The initialization step, in this exercise, is associated with the milkman as he starts from his home. Three variables chosen earlier need to be given their initial value.

As the milkman visits different houses, the values are updated. Distance travelled from `(p,q)` to `(r,s)` is `(p>r?p-r:r-p)+(q>s?q-s:s-q)`.

The maximum and minimum coordinates visited by the milkman to each house during his travel can be updated using conditional C expressions. For example, `(new_cord>old_cord)? New_cord:old_cord`.

Final answers are printed after the travel related variables have been updated for his arrival at his own home.