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HW #6

1.1. The function Mincost will take in a parameter x, which denotes the city i that the traveler is currently at. The function will return the cost of travel of the selected route to next city plus housing cost overnight. The function will also take in a binary true or false value y, this value indicates whether a bus was taken from the last stop.

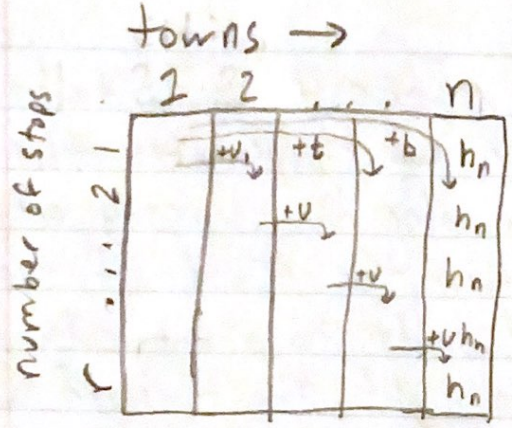
1.2. $$MinCost(x, y) = h_x + \min\left\{\begin{array}{l} b_x + MinCost(p_x, 1) \\ t_x + MinCost(q_x, 0) \\ u_x + MinCost(x+1, 0) \end{array}\right\}$$

Mincost will calculate the minimum returned cost calculated thus far, add the city housing cost, then return the total value. the base case would be:

$$MinCost(1, 0) = h_1 + \min\left\{\begin{array}{l} b_1 + MinCost(p_1, 1) \\ t_1 + MinCost(q_1, 0) \\ u_1 + MinCost(2, 0) \end{array}\right\}$$

If $y = 1$, the first case cannot be used again. if $x = n$, the recurssion stops.

1.3



we can compute "bottom up" by calculating h_n, then adding the travel cost by each available transport. The correct answer will be found at the top left corner. if there are two calculated values for one square, we take the minimum value available. we start at the n column, follow all available paths until we reach town 1, always taking the minimum value.

1.4 $O(n^3)$ calculates all possibillitys at all nodes, however this is assuming a worst case where all modes of transport move i+1 cities.