Laboratory practice No. V: Dinamic Programation

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3) Practice for final project defense presentation

1. For the resolution of problem 2.1, the algorithm of held karp was implemented to solve the problem of the traveling agenet. The Held-Karp algorithm, is a dynamic programming algorithm proposed in 1962 independently by Bellman and by Held and Karp to solve the Traveling Salesman Problem (TSP). TSP is an extension of the Hamiltonian circuit problem. The problem can be described as: a cities in a country (assuming all cities to be visited are reachable), the tour should (a) visit every city just eleven, (b) return to the starting point and (c)) be of minimum distance. Broadly, the TSP is classified as symmetric traveling salesman problem (sTSP), asymmetric traveling salesman problem (aTSP), and multi-traveling salesman problem (mTSP). The mTSP is generally treated as a relaxed vehicle routing problem.
2. The **travelling salesman problem** (**TSP**) asks the following question: "Given a list of cities and the distances between each pair of cities, what is the shortest possible route that visits each city and returns to the origin city?" It is an NP-hard problem in combinatorial optimization, important in operations research and theoretical computer science. The most direct solution would be to try all permutations (ordered combinations) and see which one is cheapest (using brute force search). The running time for this approach lies within a polynomial factor of , the factorial of the number of cities, so this solution becomes impractical even for only 20 cities. One of the earliest applications of dynamic programming is the Held–Karp algorithm that solves the problem in time .
3. In problem 2.1 we try to solve the following algorithm: Karolina is a robot that lives in a rectangular system of coordinates where each place is designated by a set of integer coordinates (x and y). Our job is to design a program that will help Karolina choose several radioactive wastes that is in your world. To do so, we must direct Karolina to the position in which each of the radioactive waste is located.
4.
5. The variables n, m represent the entries to the recursive function, that is, if it has a single entry it will be designated as n, if it has two entries one will be designated as n and the other as m, thus increasing the number of variables depending on the entries that the function has

4) Practice for midterms

1. *c a l l e*
   0 1 2 3 4 5
   c 1 0 1 2 3 4
   a 2 1 0 1 2 3
   s 3 2 1 1 2 3
   a 4 3 2 2 3 3

   m a d r e
   0 1 2 3 4 5
   m 1 0 1 2 3 4
   a 2 1 0 1 2 3
   m 3 2 1 1 2 3
   a 4 3 2 2 2 3

2. *1. O(n^2) 2. return table[lenx][leny]*
3. *1. a 2. a*
4. *1. c*
5. *1. C 2. a[mitad] 3. bus(a, mitad, de, z)*
6. *1.scm[i]=0 2. scm[i]=arr[j] 3. max++ 4. O(n^2)*
7. *4. O(n^3)*

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