

Laboratory practice No. 5: Dynamic programming

Juan Felipe Londoño Gaviria
Universidad Eafit
Medellín, Colombia
jflondonog@eafit.edu.co

Juan Pablo Giraldo Restrepo
Universidad Eafit
Medellín, Colombia
jpgiraldor@eafit.edu.co

3) Practice for final project defense presentation

3.1 The problem can be described as: search for a route through N cities in a country (assuming that all cities that can be visited are accessible), the tour must (a) visit each city only once, (b) return to the point of departure and (c) be of minimum distance. This problem is done with a hashMap, also batteries, you have a method that evaluates the distance to be able to choose the shortest route, that is, it has the possible routing to see what is the lowest cost, we have a method to recover the cost of each road. In general, the program has all the routes, all the guards, then at the end they are compared to determine the lower cost.

3.2 This problem can also be solved with Dijkstra, DFS.

3.3 After reading the file the first thing that is done is to check if we have visited that position in the "visited" array. If it is not visited, a sort of Pythagorean algorithm is done. If that distance is lower than the one had before, it is taken as the minimal route. After this all of these minimum values are added. Then the minimum value is printed. And the data structures used are arrays and arraylists.

3.4 $O(n)$

3.5 N is the size of the array

4) Practice for midterms

1.1)

	C	A	L	L	E
C	0	1	2	3	4
A	1	0	1	2	3
S	2	1	1	2	3
A	3	2	2	2	3

1.2)

	M	A	D	R	E
M	0	1	2	3	4
A	1	0	1	2	3
M	2	1	1	2	3
A	3	2	2	2	3

2.1) $O(\text{lenx} * \text{leny})$

2.2) `return table[x.length()][y.length()] or table[lenx][leny];`

3.1) (a) $O(n)$

3.2) (a) $T(n) = c1:n + c2$

4.1) (c) $O(2^n)$ and it is optimized with dynamic programming

5.1) (c) $T(n) = T(n/2) + C$ que es $O(\log n)$

5.2) `a[mitad]`

5.3) `(a, mitad, de, z);`

6.1) `sem[i] = 1`

6.2) `sem[j] = sem[j] + 1`

6.3) `max++`

6.4) (c) $O(n^2)$

7.1) `g[i][j]`

7.2) `g[k][j]`

7.3) `g[i][k]`

7.4) $O(n^3)$

5) Recommended reading (optional)

In additional PDF (Dynamic Programming)

6) Team work and gradual progress (optional)



Juan Pablo Giraldo Restrepo



Juan Felipe Londoño Gaviria

PROFESSOR MAURICIO TORO BERMÚDEZ
Phone: (+57) (4) 261 95 00 Ext. 9473. Office: 19 - 627
E-mail: mtorobe@eafit.edu.co

	UNIVERSIDAD EAFIT SCHOOL OF ENGINEERING DEPARTMENT OF INFORMATICS AND SYSTEMS	Code: ST245
		Data Structures 2

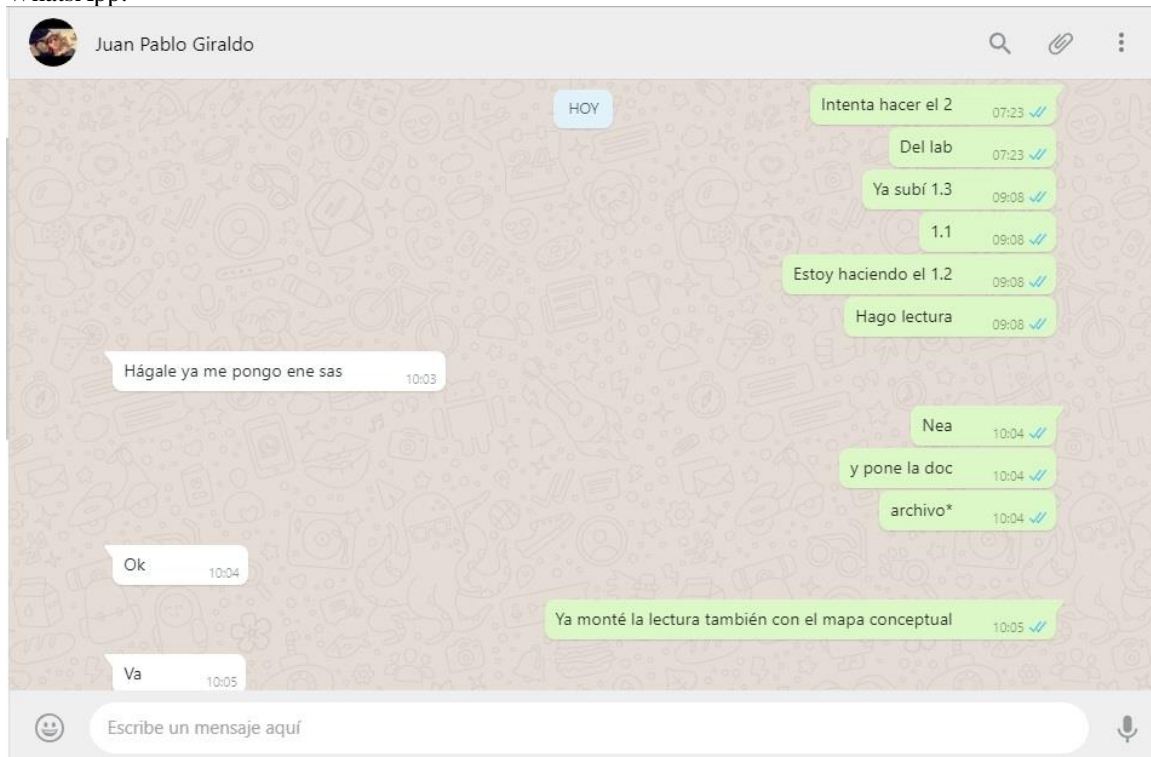
To do	In Progress 0 / 2	Done
<div>+ añadir tarea</div> <div>Code (First point) <small>p</small></div> <div>Online exercises (Second point) <small>JPG</small></div> <div>Question form <small>JPG</small></div> <div>Midterm exam <small>p</small></div> <div>Template <small>p</small></div> <div>Translate template <small>JPG</small></div> <div>Reading <small>p</small></div>	<div>+ añadir tarea</div>	<div>+ añadir tarea</div>

PROFESSOR MAURICIO TORO BERMÚDEZ
Phone: (+57) (4) 261 95 00 Ext. 9473. Office: 19 - 627
E-mail: mtorobe@eafit.edu.co

To do	In Progress 4 / 2	Done
<div>+ añadir tarea</div> <div>Translate template <small>JPG</small></div>	<div>+ añadir tarea</div> <div>Online exercises (Second point) <small>JPG</small></div> <div>Question form <small>JPG</small></div> <div>Midterm exam <small>p</small></div> <div>Template <small>p</small></div>	<div>+ añadir tarea</div> <div>Code (First point) <small>p</small></div> <div>Reading <small>p</small></div>
To do	In Progress 1 / 2	Done
<div>+ añadir tarea</div>	<div>+ añadir tarea</div> <div>Translate template <small>JPG</small></div>	<div>+ añadir tarea</div> <div>Code (First point) <small>p</small></div> <div>Online exercises (Second point) <small>JPG</small></div> <div>Question form <small>JPG</small></div> <div>Midterm exam <small>p</small></div> <div>Template <small>p</small></div> <div>Reading <small>p</small></div>

To do	In Progress 0 / 2	Done
+ añadir tarea	+ añadir tarea	+ añadir tarea
		Code (First point) p
		Online exercises (Second point) JPG
		Question form JPG
		Midterm exam p
		Template p
		Reading p
		Translate template JPG

WhatsApp:



PROFESSOR MAURICIO TORO BERMÚDEZ
Phone: (+57) (4) 261 95 00 Ext. 9473. Office: 19 - 627
E-mail: mtorobe@eafit.edu.co