



# 31

## Time is gold

25 points

### Introduction

The subway system of Barcelona is one of the best ways to move around the city; it's fast and respectful with environment!

It has a system based on "Lines", where each line is represented with a number and a color. Each line is a set of Stations that one train will cross, in order.

For example, this is the first line, that is represented as L1 with the color red:



And this is the second line, represented as L2 with the color purple:



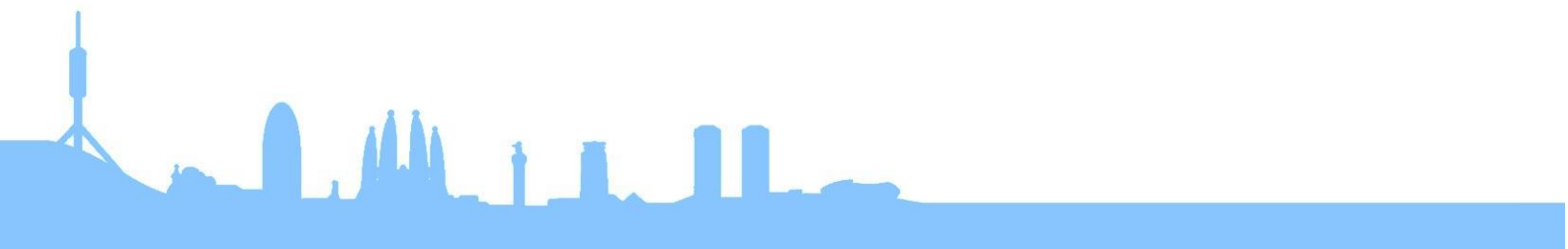
As you can see, there are some stations that have a connection with other lines, shown at the bottom of the image. This means that these stations are also on other lines. So, if you want to go from a station in L1, to a station in L2, you will have to change your train at some point. This is called a TRANSFER.

We want you to make a program that, given a starting station and a goal station, returns the best path to take.

To simplify the problem, we will consider only the first five lines of Barcelona's subway system.

Each station has an associated time requirement (and only one, no matter which line it's located on) that represents how much time in seconds is required to reach it from any of its neighboring stations.

Each transfer requires 300 extra seconds.





The tables below contain the stations and times grouped by lines. There is a .txt file where you can find this list in the

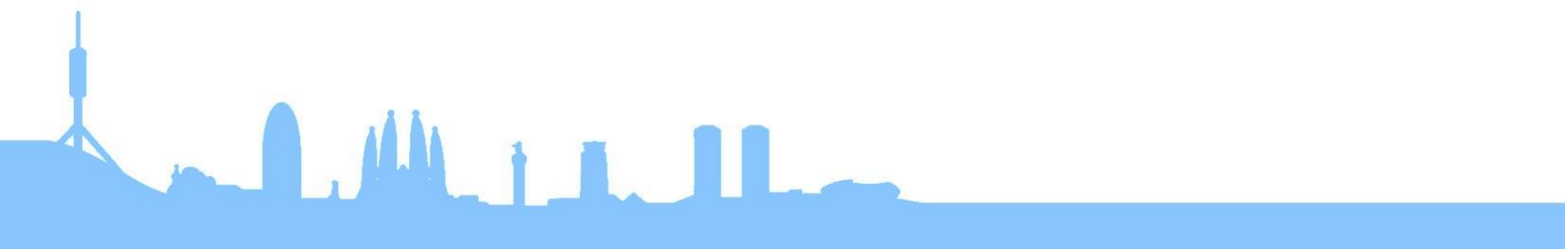


**HINTS:** There is a .txt file where you can find this list in the "Guides and tools" section.

Stations L1	Time
Hospital de Bellvitge	100
Bellvitge	108
Av. Carrilet	204
Rbla. Just Oliveras	173
Can Serra	182
Florida	130
Torrassa	146
Santa Eulalia	123
Mercat Nou	197
Placa de Sants	133
Hostafrancs	164
Espanya	149
Rocafort	172
Urgell	109
Universitat	141
Catalunya	190
Urquinaona	166
Arc de Triomf	217
Marina	207
Glories	280
Clot	155
Navas	216
La Sagrera	186
Fabra i Puig	210
Sant Andreu	153
Torras i Bages	138
Trinitat Vella	146
Baro de Viver	179
Santa Coloma	104
Fondo	144

Stations L2	Time
Parallel	208
Sant Antoni	163
Universitat	141
Passeig de Gracia	127
Tetuan	217
Monumental	152
Sagrada Familia	114
Encants	148
Clot	155
Bac de Roda	108
Sant Marti	217
La Pau	207
Verneda	118
Artigues Sant Adria	121
Sant Roc	209
Gorg	109
Pep Ventura	212
Badalona Pompeu Fabra	196

Stations L3	Time
Zona Universitaria	165
Palau Reial	216
Maria Cristina	162
Les Corts	164
Placa del Centre	120
Sants Estacio	204
Tarragona	202
Espanya	149
Poble Sec	212
Parallel	208
Drassanes	176
Liceu	176
Catalunya	190
Passeig de Gracia	127
Diagonal	184
Fontana	161
Lesseps	197
Vallcarca	203
Penitents	106
Vall d'Hebron	150
Montbau	195
Mundet	201
Valldaura	136
Canyelles	109
Roquetes	206
Trinitat Nova	162





Stations L4	Time
La Pau	207
Besos	209
Besos de Mar	126
El Maresme Forum	208
Selva de Mar	187
Poblenou	134
Llacuna	178
Bogatell	176
Ciudadella Vila Olimpica	154
Barceloneta	103
Jaume I	126
Urquinaona	166
Passeig de Gracia	127
Girona	213
Verdaguer	182
Joanic	135
Alfons X	220
Guinardo Hospital de Sant Pau	171
Maragall	206
Llucmajor	213
Via Julia	135
Trinitat Nova	162

Stations L5	Time
Cornella Centre	201
Gavarra	201
Sant Ildefons	108
Can Boixeres	216
Can Vidalet	190
Pubilla Cases	186
Ernest Lluch	158
Collblanc	149
Badal	165
Placa de Sants	133
Sants Estacio	204
Entenca	112
Hospital Clinic	101
Diagonal	184
Verdaguer	182
Sagrada Familia	114
Sant Pau Dos de Maig	215
Camp de l'Arpa	120
La Sagrera	186
Congres	120
Maragall	206
Virrei Amat	149
Vilapicina	194
Horta	175
El Carmel	218
El Coll La Teixonera	162
Vall d'Hebron	150

## Input

The input consists of 2 lines:

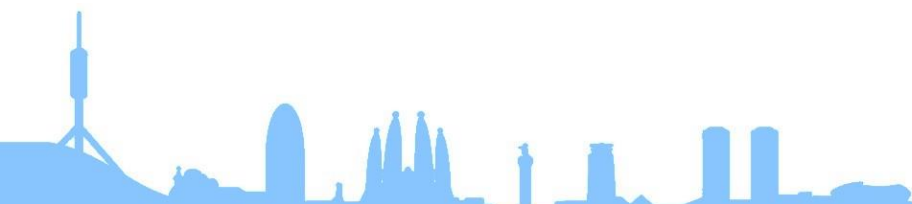
- The first line defines the starting station.
- The second line is the goal station

## Output

The output consists of:

- The final time of the path, expressed as:  
Total time: *\_time\_* seconds
- The final path:  
Best path from *\_source\_* to *\_destination\_*: *\_source\_*, *\_station1\_*, *\_station2\_*, ..., *\_destination\_*

**Important!** It is not possible to tie, all the inputs have a unique solution.





### Example 1

#### Input

Bellvitge

Hospital de Bellvitge

#### Output

Total time: 100 seconds

Best path from Bellvitge to Hospital de Bellvitge:

Bellvitge, Hospital de Bellvitge

### Example 2

#### Input

Can Serra

Tetuan

#### Output

Total time: 2108 seconds

Best path from Can Serra to Tetuan:

Can Serra, Florida, Torrassa, Santa Eulalia, Mercat Nou, Placa de Sants, Host afrancs, Espanya, Rocafort, Urgell, Universitat, Passeig de Gracia, Tetuan

### Example 3

#### Input

Urgell

Clot

#### Output

Total time: 1354 seconds

Best path from Urgell to Clot:

Urgell, Universitat, Passeig de Gracia, Tetuan, Monumental, Sagrada Familia, Encants, Clot

