

PRACTICE 3

Con ayuda de las funciones *graph_deepFirst*, *graph_breadthFirst* y *pathFromTo* aplicándolas a diferentes grafos, analice y discuta las dos formas de recorrer un grafo en profundidad y en anchura.

```
Status graph_breadthFirst (Graph *pg, long ini_id, long end_id, char *nodestraversed);
```

From Origin to End:

```
[nuevos_ministerios, 1, -1, 1, 5][república_argentina, 2, 1, 1, 2][avenida_de_america, 3, 2, 1, 7][nunez_de_balboa, 4, 3, 1, 4][principe_de_vergara, 9, 4, 1, 4][retiro, 10, 9, 1, 2]
```

Siblings are visited before children. The algorithm is a vertex-based algorithm and stores the nodes in a queue. It uses more memory than in the deep first search.

The tree that you have at the end of the execution is wide and short, compared to the one that results from the dfs, and the oldest unvisited vertices are explored at first.

It is Optimal for finding the shortest distance, not in cost.

```
Status graph_deepFirst (Graph *pg, long ini_id, long end_id, char *nodestraversed);
```

From Origin to End:

```
[nuevos_ministerios, 1, -1, 1, 5][santiago_bernabeu, 38, 1, 1, 2][cuzco, 59, 38, 1, 2][plaza_de_castilla, 76, 59, 1, 5][chamartin, 86, 76, 1, 3][bambu, 97, 86, 1, 2][pinar_de_chamartin, 106, 97, 1, 2][manoteras, 112, 106, 1, 2][hortaleza, 105, 112, 1, 2][parque_de_santa_maria, 95, 105, 1, 2][san_lorenzo, 85, 95, 1, 2][mar_de_cristal, 75, 85, 1, 3][canillas, 107, 75, 1, 2][esperanza, 99, 107, 1, 2][arturo_soria, 89, 99, 1, 2][avenida_de_la_paz, 77, 89, 1, 2][alfonso_xiii, 60, 77, 1, 2][prosperidad, 39, 60, 1, 2][avenida_de_america, 3, 39, 1, 7][cartagena, 40, 3, 1, 2][parque_de_las_avenidas, 61, 40, 1, 2][barrio_de_la_concepcion, 78, 61, 1, 2][pueblo_nuevo, 64, 78, 1, 2][quintana, 44, 64, 1, 2][el_carmen, 8, 44, 1, 2][ventas, 42, 8, 1, 4][manuel_becerra, 6, 42, 1, 4][odonnell, 43, 6, 1, 2][sainz_de_baranda, 63, 43, 1, 3][conde_de_casal, 79, 63, 1, 2][pacifico, 90, 79, 1, 3][mendez_alvaro, 101, 90, 1, 2][arganzuela_planetario, 108, 101, 1, 2][legazpi, 102, 108, 1, 3][usera, 109, 102, 1, 2][plaza_eliptica, 113, 109, 1, 2][opanel, 119, 113, 1, 2][oportito, 114, 119, 1, 4][carpetana, 120, 114, 1, 2][laguna, 121, 120, 1, 2][lucero, 122, 121, 1, 2][alto_de_extremadura, 123, 122, 1, 2][puerta_del_angel, 124, 123, 1, 2][principe_pio, 48, 124, 1, 5][arguelles, 51, 48, 1, 4][san_bernardo, 17, 51, 1, 4][bilbao, 22, 17, 1, 4][alonso_martinez, 27, 22, 1, 6][chueca, 26, 27, 1, 2][gran_via, 24, 26, 1, 4][sol, 13, 24, 1, 6][sevilla, 12, 13, 1, 2][banco_de_espana, 11, 12, 1, 2][retiro, 10, 11, 1, 2]
```

Go deeper whenever possible, children are visited before siblings. The algorithm is a Edge-based algorithm and stores the nodes in a stack. It uses the memory more efficiently than in the deep first search.

The tree that you have at the end of the execution is Narrow and long, compared to the one that results from the bfs, and the Vertices along the edge are explored in the beginning.

This algorithm is not optimal in comparison with the bfs.