Assignment #4 (Programming Assignment)
Breadth First Search on Graphs
Due Date: August 10, Friday (send e-mail to tcan@ceng.metu.edu.tr)

In this assignment you are going to implement Breadth First Search on undirected graphs. You are going to write a function named BFS in the code we have developed during class, graphReader.c. The latest version of the code can be found at:

http://www.ceng.metu.edu.tr/~tcan/cng315_summer2012/codes/graphReader.c

The prototype of the function you are going to write is:

```c
void BFS(char* sourceID)
{
}
```

In this function, you are going to get a vertex identifier as a parameter and start a breadth first search from that vertex. You may use the pseudocode given in Chapter 22.2. The output of the function will be the distances of the nodes from the source node in terms of number of edges. The distances of unreachable nodes can be printed as -1 (treated as infinity, or NULL).

The graphReader.c reads an edge list as an undirected graph and constructs an adjacency matrix denoted with the variable A. A is a two dimensional array of size numVertices x numVertices. The vertex identifiers are in a one dimensional array named vertexIDs and the indices of vertexIDs and the indices used in the adjacency matrix A are the same indices that denotes the same vertices.

**Input:**
Run your BFS function on the input graph fig3.tab which can be found at:

http://www.ceng.metu.edu.tr/~tcan/cng315_summer2012/codes/fig3.tab

Use EGF as the source vertex.

**Output:**
A list of vertex identifiers and distances printed at each line.

```
e.g.
EGF  0
ERBB1  1
AA -1
.......  
```

**Submission:**
Send your source code and output to tcan@ceng.metu.edu.tr.