Homework Project 1

Given 09/05/2018, Due 09/26/2018

The aim of this project is to create a program explores a graph that is a subgraph of the set of grid points. Some grid points are blocked; if they are blocked, then they are blocked from all directions. You control a robot with the following commands

(1) `void start()` initializes the robot and puts it at the starting position; is called only at the beginning.

(2) `int move_forward()` attempts to move one step forward; it returns 1 if successful and 0 if not successful. If not successful (the next grid point in the forward direction is blocked), the robot does not move.

(3) `void turn_left()` turns the robot a quarter-turn in counter-clockwise direction.

(4) `void turn_right()` turns the robot a quarter-turn in clockwise direction.

(5) `void end()` is called at the end of your exploration.

Your exploration is subject to the following requirements:

(a) Your robot must visit all reachable points.

(b) The robot must be returned to his starting position when you call `end`.

(c) Once a point is known as blocked, the robot must not again try to move into it.

My test program will keep track of the total length travelled, as well as the total number of turns. I will give a plus to solutions with especially small total cost.

The programming language is C or C++; test your code before submission using the `gcc` or `g++` compiler. Please remove all dead code; try to program as clearly as possible, since I try to read it. Do not copy code from another student or from a web site.

Submit your source code by e-mail to `phjmbrass@gmail.com`; include the course (I06) and homework number in the subject line, and your name as a comment in the homework file. If you submit multiple files, you can pack them with the `tar` archiver.