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CS 1A

Fall 2017 Foothill

Assignment 3

The program has 5 instance varibles, totalMoves, movesNorth, movesEast, movesSouth, and movesWest. totalMoves keeps track of the number of spaces moved in total while the others track the movements in specific directions. These variables are updated with every move and will be used to print out the number of moves at the end of the program.

movesCounted() is essentially move() with additional functionalities: it puts down a thing if possible, and updates the instance variables. It starts by calling putThingIfPossible(), then checks the robot’s current direction and add one to the respective moves variable. It then adds 1 to totalMoves regardless of the current direction, then finally moves forward one space.

putThingIfPossible() checks if there are things in the robot’s backpack and and if the robot can pick up a thing at the current location. If those checks passes, which means that the robot has things in its backpack and there isn’t a thing at its current location, putThingIfPossible() will call putThing() to put down a thing.

printEverything() accesses the instances variables stored in the class to print the number of moves in total and in each direction.

The while loop in navigateMaze() checks each step to see if the robot is already at the end of the maze. If not then the robot will continue trying to find the end spot. The robot navigates through the maze by constantly checking if the left side is clear. It does so by turning left and calling frontIsClear(). If left is clear it will move in that direction. If not it will check to see if front is clear and move forward if so, before checking the right side and do the same. If left, front, and right sides are all blocked, it means that the robot is at a dead end and it will turn around. By doing so the robot will prioritize turning left over the other options, which means that it won’t repeat itself and get stuck in a loop. When the condition of the while loop is met, it means that the robot has reached the end of the maze. It will then call putThingIfPossible(), because in the movesCounted() method, putThingIfPossible() is called prior to moving. The result of such is that the robot won’t put a thing after the last move, i.e. the end spot, which is why putThingIfPossible() has to be called an additional time at the end of the maze. The program then calls printEverything() to print a “Done!” message as well as the move counts.