CIS365 Programming Assignment 3

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1 Overview

The Logo programming language introduced the concept of turtle graphics. In this assignment you will implement a simple ASCII-art based turtle graphics interpreter.

2 Background

Suppose that you have a robot turtle that walks around a room under the control of a computer program. The turtle holds a pen that can be in one of two positions: up or down. When the turtle's pen is down, it traces out a shape on the floor of the room and while the pen is up, the turtle moves around freely without writing anything.

Assume that floor of the room is divided up into a set of tiles. The user can input the number of tiles on the command-line when they start the program. If no input is provided, then we assume that the floor is divided into a 50-by-50 grid of tiles. You program needs to read commands from the standard input and then feed the commands to the turtle. You need to keep track of the current position of the turtle and the state of the pen.

The tiles are number in rows and columns with the row numbers and column numbers both starting at 0. Assume that your turtle starts in the tile numbered (0,0) and that its pen is in the up position. All tiles are blank when the program starts. This means that each tile has their state set to 0. If the turtle has marked a tile, then the state of that tile is set to 1.

Each command is identifed by a number and some commands can have a single parameter. Commands are defined as follows:

COMMAND

MEANING

1 Pen Up

2 Pen Down

3 Turn Right

4 Turn Left

5,x Move forward by x number of spaces

6 Display the floor grid

7 Clear the grid

9 Terminate program

When the turtle is given 6 command, you will need to write the contents of the floor grid to the standard output. Display an asterisk when the tile is set to 1 and a blank when it is set to 0. On a 7 command, you should clear the grid of tiles by setting all tile values to 0.

3 Problem 1: Turtle graphics (ASCII version)

Write a program in C# that simulates the operation of the turtle and implements a computerized sketchpad. Write several turtle graphics programs that draw interesting shapes to use for testing your program.