Assignment 9

Part 1: Functions that Take a Parameter

In class we discussed methods (functions) that take in a parameter. Augment SuperBot by writing and testing the following useful functions:

void putBeepers (int numBeepers)
// puts down numBeepers beepers
// - if the robot does not have enough beepers, it puts
//   down as many as it can before stopping without error

void pickBeepers (int numBeepers)
// picks up numBeepers beepers
// - if there are not enough beepers on the corner, the
//   robot picks up as many as he can before stopping
//   without error

void walk (int numBlocks)
// walks numBlocks blocks
// - if the robot encounters a wall, it stops moving
//   without error

Part 2: Functions that Return a Value

In class we discussed methods (functions) that return an integer value. Augment SuperBot by writing and testing the following useful functions:

int numBeepersInBag ()
// returns the number of beepers in the robot's bag
// - assumes a finite number of beepers in the bag
// - there are no side effects

int numBeepersOnCorner ()
// returns the number of beepers on the corner the robot
// is standing on
// - assumes a finite number of beepers on the corner
// - there are no side effects

int distanceToWall ()
// returns the number of blocks between the robot and a
// wall in the robot's path
// - assumes there is a wall in the robot's path
// - there are no side effects
Part 3: MathBot

Program a robot to do simple addition of two-digit numbers. In this world, numbers are represented by piles of beepers in the ones column on 3rd avenue and the tens column on 2nd avenue. If needed, the hundreds column is on 1st avenue. A corner with no beepers represents a zero. The robot must deal with carries properly.

Examples:

- $15 + 23 = 38$
- $5 + 38 = 43$
- $99 + 4 = 103$

There are several worlds to use for testing on the class web site.
Part 4: SorterBot

Program a robot to arrange vertical stacks of beepers into ascending order. Each avenue, starting at the origin, will contain a stack of one or more beepers. The first empty avenue will mark the end of the piles that need to be sorted.

Start:

End:

There are two worlds on the class web site to use for testing.