Homework 1: Go Karel, Go

Due Date: Tuesday, September 9, 2008.

There is a possible 36 points for this homework.

Problem 1. (10 pts.) Karel is practicing for the Robot Olympics. One of karel’s events is the shuttle race. The shuttle race requires karel to move around two beepers in a figure 8 pattern. Write a Monty-Python program that instructs karel to walk a figure 8 pattern as fast as possible (fast implies as few instructions as possible). Karel must stop in the same place it starts and must be facing the same direction.

![Figure 1: The Shuttle Race](image)

Problem 2. (10 pts.) Write a Monty-Python program to accomplish the following: A robot named karel is at the origin (1,1) facing North with one beeper in its beeper bag. Three blocks east of it is another robot named carl, facing East with no beepers. There are no wall sections or beepers in the world. Have karel walk to carl and give carl the beeper. Carl should then carry the beeper two blocks north and put it down. Both robots should then return to their original locations, facing their original directions.

Problem 3. (10 pts.) Teach (i.e. program) karel to “harvest” a baseball diamond field of beepers.
See Figure 2. The preconditions for this problem is that karel is at the origin (1,1) facing East. The postcondition is that Karel is at 6th avenue and 9th street, facing North with 16 beepers in its bag.

For this problem you must create a new robot class to “extend” the UrRobot class. This class should be specifically designed to perform the harvesting task.

![Figure 2: The Field of Dreams](image)

**Problem 4.** (3 pts.) How long would it take a robot to put down an infinity of beepers?

**Problem 5.** (3 pts.) If a robot named karel is on a corner with an infinite number of beepers and it picks one up, how many are left on the corner? How many are in the beeper-bar?

In addition to correctness and documentation, you will be graded on your function decomposition/design.

To submit your programs you need to:

1. print out a hardcopy to physically hand in on the due date.
2. email the code to mikeyg@cs.xu.edu for testing.

There will be a 5 point penalty for not doing both submission tasks.