1 Rabbit cast from the garden

From assignment #1 rabbit learned to run forever and he grew healthy and happy on his carrots. Now within rabbit’s hoard, there was a special golden carrot that rabbit was expressly told not to eat. But rabbit couldn’t resist. It just glistened so brightly and one day rabbit took a bit chomp on this carrot of solid gold. Immediately rabbit was taken by the ear and cast into a new, dirty world.

In this dirty world when rabbit (or wolf) jumps there is a 20% chance that they jump slightly to the left or right. So for example if rabbit jumps ’N’, there is a 10% chance that he ends up ’NE’ and a 10% chance he ends up ’NW’ (if there is a stone at this place, rabbit does not move.). Also in this new world rabbit (and wolf) can only see a distance of two squares (This defines a zone of 24 spaces that form rabbit’s (or wolf’s) perceptual field. Finally gone are the days of immortality too. If wolf catches rabbit, it’s for good. No reincarnation.

2 The Assignment

Working in groups of up to two, students are to implement a reasonably self-preserving rabbit and a cunning wolf. One suggestion is to use artificial life to evolve the two players. You are to implement your solution so that it engages a central server that will play out the simulated world. Each play cycle will present your player with its changing visual field, followed by your player answering what its response is. Specifically the server gives two visual fields: The first being the field just prior to the other player’s move, and the second report is the perceptual field after the other player’s move.

The implementation of the server is provided on the course website and operation and protocol are spelled out here:

Start server by

./WolfRabbitServer MAPFILE WOLFPOR RABBITPORT

Map format is a line specifying width and height and lines the same format as in the network protocol.

Example map:
3 5
W @
@ R
@ @

WolfRabbitServerProtocol

The server acts maintains the world view for the wolf and rabbit agents.

Each agent connects to the server over TCP/IP

When connected the agents receive 2 sensor reports to which they have to answer with action reports. The first report is the perceptual field before the opponent’s move and the second report is the perceptual field after the opponent’s move

1To simplify the problem, assume that rabbit and wolf can see over stones.
Sensor report format: (ascii characters)
5x5 chars delimited by ‘\n’
@ - means wall
W - means wolf
R - means rabbit
' ' - means open ground
Answer report format: (ascii charachters)
'4' - west
'7' - north west
'8' - north
'9' - north east
'6' - east
'3' - south east
'2' - south
'1' - south west
'5' - stationary

The socket is closed when wolf has eaten a rabbit meal.

3 Report

You should hand in a complete and well written report in the box marked 5DV019 (max 2 pages). Also provide a link to your source code, residing in your edu folder, along with runnable files (compiled binaries or scripts) that can be easily run on the departments Linux systems.