1 Rabbit hops free

From assignment #2 rabbit struggled long and hard. In fact the struggle lasted for so long that some of the stones crumbled into ruins, leaving ground covered by sharp gravel. After what seemed like an eternity, wolf also grew tired and began to have pangs of guilt about causing so much grief to poor rabbit over the years. In a heartfelt scene, wolf bid goodbye to rabbit and retired.

Now a bright light illuminates this new world. Rabbit can see the entire map, his place in it, and a fresh carrot glistening off in the distance. Of course rabbit is a little older and his balance is off. Thus when rabbit now jumps there is a 50% chance that he jumps slightly to the left or right. So for example if rabbit jumps 'N', there is a 25% chance that he ends up 'NE' and a 25% chance he ends up 'NW' (if there is a stone at this place, rabbit does not move.). While Rabbit can not jump on whole stones, he can jump on gravel. This however causes great pain in his paws. Specifically every turn rabbit stands in gravel, he is inflicted with -1.0 units of pleasure (negative pleasure is 'pain'). When rabbit reaches the carrot he is rewarded with 5.0 units of pleasure.

2 The Assignment

Working in groups of up to two, students are to implement a perfectly rational rabbit. We strongly suggest that students employ MDPs to achieve this solution. Please have it so that your client starts with the command line argument $\gamma$ (which represents the discounting factor).

Start server by

```
./RabbitAndCarrotServer MAPFILE RABBITPORT
```

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

Example map:

```
3 5
C .@ .
.. R
@
```

CarrotServerProtocol

The rabbit client connects to the server over TCP/IP

When connected the rabbit receives world maps to which they have to answer with action reports

Sensor report format: (ascii charachters)
n by m maps delimited by '

@ - means wall
. - means gravel that hurts rabbit’s paws
R - menas rabbit
’’ - means open ground
C - menas carrot
Answer report format: (ascii characters)

'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 rabbit has reached the carrot.

3 Report

You should hand in a complete and well written report in the box marked 5AV019 (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.