Assignment 7– Reinforcement learning

Assignment overview. This assignment is designed to practice some of the reinforcement learning principles. The first question is applying a reinforcement algorithm to a maze example by hand. Of course, you could write a program to do this, and this might be a good by itself and a good way to check you answer, but calculating it first by hand could give you a much better feeling of what is going on. The second part is meant to try out some more recent.

Submission. Create a folder called ML_Assignment7 and put all the files inside the folder. Compress this folder to create either ML_Assignment7.zip or ML_Assignment7.rar. Submit this compressed folder as your assignment submission on Brightspace.

*Submission deadline.* Thursday, Nov 23, 10:00 pm.

Late submission policy. If submitted after the due date, the penalty will be 10% per day.

Academic Integrity. Dalhousie academic integrity policy applies to all submissions in this course. You are expected to submit your own work. Please refer to and understand the academic integrity policy, available at https://www.dal.ca/academicintegrity

If you have a question: Teaching Assistants (TAs) will be present during the labs to help you with any questions you may have. If you still have questions, feel free to email me at tt@cs.dal.ca.

Questions:

1. **[20 marks] What** are the optimal Q values for the T-maze below, assuming that we value diminishing returns with y=0.5?
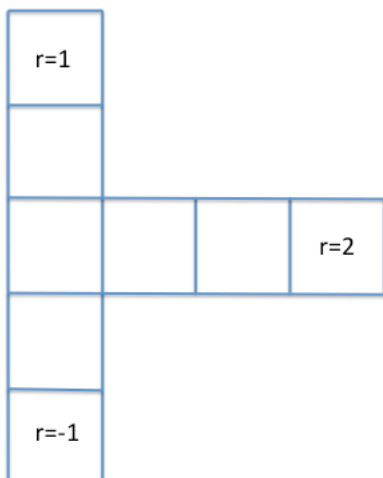
2. **[80 marks]** Implement a neural network version of an RL to solve the linear maze example and submit your program as jupyter notebook.

State x:	0		1		2		3		4	
$\rho(x)$:	1		0		0		0		2	

	s	*s*	*l*	*r*	*l*	*r*	*l*	*r*	*s*	*s*
Q*(x,u):	*0*	*0*	*1*	*0.5*	*0.5*	*1*	*0.5*	*2*	*0*	*0*

| $\pi(x)$: | ↻ | | ← | | → | | → | | ↻ | |