Homework 3

CIS4930/5930

Due in-class, Wednesday, Nov. 20

Instructions: Graduate students must complete all problems. Undergraduates may receive extra credit for working problems marked with (*). Show all work for full credit. Partial credit for incomplete / incorrect arguments will be given at the discretion of the instructor / TA.

1. (5 points) MRT, Exercise 7.3.

2. (5 points) MRT, Exercise 9.5.

3. For the MDP shown in Figure 17.3 of the MRT textbook, let $R1 = 1$, $R2 = 3$, $R3 = 10$, and $\gamma = 1/2$.

   (a) (3 points) apply 3 iterations of the value iteration algorithm, starting from values $V(start) = 0$, $V(other) = 0$.

   (b) (3 points) apply 3 iterations of the policy iteration algorithm, starting from the policy π given by $\pi(start) = search$, $\pi(other) = carry$.

4. (5 points) Show that the Frobenius norm $\|M\|^2 = \sum_{i=1}^{m} \sum_{j=1}^{n} M_{ij}^2$ is induced by the inner product $< M, N >_F = Tr(M^T N)$.