Homework-6

Capstone - Yuhua

1. Eric & Hien read Section 19.2 and write down the Pseudo code for applying UCB to stochastic linear bandits.
2. Xiqiang & Vivek read Section 36.3 and write down the Pseudo code for applying Thomson Sampling to stochastic linear bandits.
3. Explain your Pseudo code in class.
4. Implement the UCB and Thomson Sampling method to the following stochastic linear bandit problem.
   (a) The reward of arm a_1 & a_2 is $\nu a_i + \eta$ with unknown ν, known (a_1, a_2). Here η follows the normal distribution $N(0, 1)$.
   (b) Try to implement the algorithm for different $\nu \in [-0.5, 0.5]$ and different (a_1, a_2).

   $$(a_1, a_2) = (0.1, -0.1); \quad (a_1, a_2) = (0.1, -0.2); \quad (a_1, a_2) = (0.1, 0.2);$$

   (c) Plot the expected regret and variance for the above 3 different values of (a_1, a_2) in terms of ν.
5. **Please**
   submit exercise 1 & 2 before 3:30 pm Nov 15;
   submit exercise 4 with UCB method before 3:30 pm Nov 22;
   submit exercise 4 with Thomson Sampling method before 3:30 pm Nov 29; through slack.