

## Homework 9

Do the problems on **Webwork** and upload the following problems to Gradescope before 8 am on Mar. 27th.

**Homework should be written neatly and clearly explained. Include your name and id number in the top right corner of your homework.**

**Problem 1.** You play in a soccer tournament, that consists of 5 games. Each game you win with probability .6, lose with probability .3, and tie with probability .1, independently. Let  $W$  be the number of games you win,  $L$  be the number of games you lose, and  $T$  be the number of games you tie.

- (a) What is the joint pmf of  $W, L, T$ ?
- (b) What is the marginal pmf of  $W$ ?

**Problem 2.** You roll a fair 4-sided dice, let  $Y$  be the outcome of the dice roll. Then conditioned on the event  $\{Y = k\}$  for  $k = 1, \dots, 4$  you randomly choose,  $X$ , to be geometric random variable with mean  $k$ .

- a) What is the conditional pmf of  $X$  given  $Y$ ?
- b) What is the joint pmf of  $X$  and  $Y$ ?
- c) What is the marginal pmf of  $X$ ?

Each of answers should state where your pmfs are positive and where they are 0 (this is usually the otherwise... part).