Homework 1

CS 464 - Introduction to Machine Learning

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November 9, 2020

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1 Probability Questions

Question 1.1

Since the probability of having exactly 1 turnover for the season is asked, there are only 4 possibilities. A turnover would be occur when a winning/losing comes before or after a series of losing/winning. The possibilities are:

- W W W W W W W L
- L W W W W W W W
- W L L L L L L L
- L L L L L L L W

The probability of a lose in a winning series is

$$P = \binom{8}{7}(0.6)^7(0.4)^1$$

$$P(X = 7) = 0.01119744 \approx 0.01$$

An the probability of a win in a losing series is the following.

$$P(X = 1) = \binom{8}{1}(0.6)^1(0.4)^7$$

$$P(X = 1) = 0.00786432 \approx 0.008$$

Total probability is given in Eq. 1.

$$P(X = 1 \text{ Turnover}) = 2(0.01) + 2(0.008) = 0.036 \tag{1}$$

A Python Code