MSAI Statistics & Probability – Week 8 Seminar & HW

Problem 1: An editor types a wrong symbol with probability $p = 0.0005$ $(5 \cdot 10^{-4})$. Find an approximate value of probability that he/she will make at most 3 mistakes among 10.000 (10^4) symbols.

Problem 2: A dice is thrown 1800 times. Find an approximate value of probability that the total number of 2-s and 6-s is at least 620.

Problem 3: Let $X_n \sim \text{Bin}(n, 1/2)$ (a random variable with binomial probability distribution). How small is the probability that $X_n < \frac{n}{3}$? Is it smaller than $\frac{1}{n^{1000}}$ for large enough n?