

HW#2 Due Wed Jan 23, 2019, at the beginning of class. Submit on paper, stapled together, your name in upper right corner.
Work Parts I, II and III.

Part I: In our textbook:

Assigned problems:

pg 316/ 5.4.2, 5.4.6, 5.4.8,

pp 319-320/ 5.4.17, 5.4.18

Others to try, but not submit:

pg 316/5.4.3, 5.4.5

Part II: "Ignoring some data"

You walk to Stevens Way and wait for a bus. Instead of getting on the bus, you record your waiting time T_1 .

You repeat this for a total of 50 buses, obtaining $T_2 \dots T_{50}$. Assume they arrive as a Poisson process with λ buses per minute.

(a) What is the "population" here?

(b) According to your assumption, what distribution should the wait times follow?

(c) Find an unbiased estimator for the mean of this distribution using only the data from the first 20 buses.

(d) Find another estimator using all the data.

(e) Before doing any further computations, consider your estimators from (c) & (d). Guess which one is "better" and why. (Your score on this problem part depends on your explanation, **reasoning** & justification.)

(f) Calculate the MSE of each. Try to reduce the problem to expectations or variances involving a single datum.

(g) What is the purpose of these Part II tasks & questions? Why did we have you do this?

Part III: Expected Value of S^2

Copy the steps in our in-class derivation of $E(S^2)$ on Fri 11-January, but add these pieces.

- Give a justification for each step.
- Explicitly specify the indices of summation and their limits (e.g. sum $i=1$ to n).
- Find the error in the derivation from class. Correct and complete the derivation.