

HW 4: Ch 9, problem 3(c). Only to find the standard error of $\hat{\tau}$ using the delta method.

Ch9, problem 4

Ch9, problem 6

Ch9, problem 7. We don't need to consider d(ii).

Note: In problem 3, we know $\hat{\tau} = \hat{\mu} + 1.645\hat{\sigma}$, and need to calculate $var(\hat{\tau})$, which is equal to

$$\begin{aligned} & var(\hat{\mu}) + var(1.645\hat{\sigma}) + 2cov(\hat{\mu}, 1.645\hat{\sigma}) \\ = & var(\hat{\mu}) + 1.645^2 var(\hat{\sigma}) + 3.29cov(\hat{\mu}, \hat{\sigma}). \end{aligned}$$

The second term in the equation above involves $var(\hat{\sigma})$. One way to calculate $var(\hat{\sigma})$ is to apply delta method, which will be introduced next Monday.

On Monday, we will show $\hat{\mu}$ and $\hat{\sigma}$ are independent, then $cov(\hat{\mu}, \hat{\sigma}) = 0$. You may use this as a fact in your homework. The zero correlation will also appear in part (c) of problem 7.