Chapter 7

7.1

Given that $\bar{X} = 78, \sigma^2 = 25, n = 10, \alpha = 0.05$ test $H_0 : \mu \geq 80$, assuming that observations are randomly sampled from a normal distribution.

```
xbar <- 78; sigma <- 5; n <- 10
mu <- 80; alpha <- 0.05
```

7.2

Repeat the previous exercise, but test $H_0 : \mu = 80$

```
xbar <- 78; sigma <- 5; n <- 10
mu <- 80; alpha <- 0.05
```

7.3

For the data in Exercise 1, compute a 0.95 confidence interval and verify that this interval is consistent with y our decision about whether to reject the null hypothesis $H_0 : \mu = 80$.

```
xbar <- 78; sigma <- 5; n <- 10
mu <- 80; alpha <- 0.05

xbar + qnorm(c(Lower = alpha/2, Upper = 1 - (alpha/2))) * sigma/sqrt(n)
```

```
   Lower    Upper 
74.90102 81.09898 
```

80 is in the confidence interval, so fail to reject.

7.4

For exercise 1, determine the p-value.

7.5

For exercise 2, determine the p-value.

7.6

Given that $\bar{X} = 120, \sigma = 5, n = 49, \alpha = 0.05$, test $H_0 : \mu \geq 130$, assuming that observations are randomly sampled from a normal distribution.

7.7

Repeat the previous exercise but test $H_0 : \mu = 130$.

7.8

For the previous exercise, compute a 0.95 confidence interval and compare the result with your decision about whether to reject H_0.

7.9

If $\bar{X} = 23$ and $\alpha = 0.025$, can you make a decision about whether to reject $H_0 : \mu \leq 25$ without knowing σ?

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