

MATH 3080 Lab Project 2

Aini Liang

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- [Problem 1 \(8.3\)](#)
- [Problem 2 \(8.9 modified\)](#)

Remember: I expect to see commentary either in the text, in the code with comments created using `#`, or (preferably) both! **Failing to do so may result in lost points!**

Problem 1 (8.3)

A new drug therapy is tested. Of 50 patients in the study, 40 had no recurrence in their illness after 18 months. With no drug therapy, the expected percentage of no recurrence would have been 75%. Does the data support the hypothesis that this percentage has increased? What is the p-value?

```
# Your code here
prop.test(x = 40, n = 50, p = 0.75, alternative = "greater")
```

```
##
## 1-sample proportions test with continuity correction
##
## data: 40 out of 50, null probability 0.75
## X-squared = 0.42667, df = 1, p-value = 0.2568
## alternative hypothesis: true p is greater than 0.75
## 95 percent confidence interval:
## 0.6816372 1.0000000
## sample estimates:
## p
## 0.8
```

Problem 2 (8.9 modified)

A study of the average salaries of New York City residents was conducted for 770 different jobs. It was found that massage therapists average \$58,260 in yearly income. Suppose the study surveyed 25 massage therapists and had a standard deviation of \$3,250. Perform a significance test of the null hypothesis that the average massage therapist makes \$55,000 per year against the one-sided alternative that it is more. Assume the data is normally distributed.

Next, suppose the true population mean is \$57,000. Find beta, the probability of type II error.

```
# Your code here

# use t test
mu0 = 55000
n = 25
sigma = 3250
c = mu0 + qt(0.95, n - 1) * sigma/sqrt(n)
alpha = pnorm((c - mu0)/(sigma/sqrt(n)), lower.tail = F)
t = (55000 - 58260)/(sigma/sqrt(n))
pt(T, df = n - 1, lower.tail = F)
```

```
## [1] 0.1636434
```

```
deta = pt((c - 57000)/(sigma/sqrt(n)), n - 1)
```