MATH 3070 Lab Project 13

Pranav Rajan

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Contents

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 (Verzani problem 8.7)

Of the last ten times you've dropped your toast, it landed sticky-side down nine times. If these are a random sample from the Ber(p) distribution, find an 80% confidence interval for p, the probability of the stidy side landing down. (Use `binconf()` *(**Hmisc**) to compute the score interval.)*

```
# Your solution here
```

Problem 2 (Verzani problem 8.10)

A survey is taken of 250 students, and a $\hat{p}$ of 0.45 is found. The same survey is repeated with 1000 students, and the same $\hat{p}$ is found. Compare the two 95% confidence intervals. What is the relationship? Is the margin of error for the second one four times smaller? If not, how much smaller is it? (Use `binom.test()` *to answer this problem.)*

```
# Your solution here
```

Problem 3

For the `Melanoma` *(**MASS**) data set, use* `prop.test()` *to find a 99% confidence interval for the difference in proportion of male and female patients with an ulcer.*

```
# Your solution here
```

Problem 4 (Verzani problem 8.15)

*The stud.recs (**UsingR**) data set contains a sample of math SAT scores from some population in the variable sat.m. Find a 90% confidence interval for the mean math SAT score for this data. (Do not use 't.test(); find this confidence interval "by hand".)*

```
# Your solution here
```

Problem 5 (Verzani problem 8.15)

*For the homedata (**UsingR**) data set find 90% confidence intervals for both variables y1970 and y2000, assuming the sample represents some population. Use t.test(), but first discuss whether the model assumptions are appropriate (include some check of the assumptions, like a Q-Q plot).*

```
# Your solution here
```

Problem 6 (Verzani problem 8.26)

In determining the recommended dosage of AZT for AIDS patients, tests were done comparing efficacy for various dosages. If a low dosage is effective, then that would be recommended, as it would be less expensive and would have fewer potential side effects.

A test to decide whether a dosage of 1,200 mg is similar to one of 400 mg is performed on two random samples of AIDS patients. A numeric measurement of a patient's health is made, and the before-and-after differences are recorded after treatment:

Treatment										
400 mg group	7	0	8	1	10	12	2	9	5	2
1200 mg group	2	1	5	1	5	7	-1	8	7	3

Find a 90% confidence interval for the differences of the means. What do you assume about the data?

```
# Your solution here
```

Problem 7 (Verzani problem 8.27)

The following data is from IQ tests for pairs of twins that were separated at birth. One twin was raised by the biological parents, the other by adoptive parents.

Twin pair	1	2	3	4	5	6	7	8	9	10
Foster	80	88	75	113	95	82	97	94	132	108
Biological	90	91	79	97	97	82	87	94	131	115

Find a 90% confidence interval for the differences of mean. What do you assume about the data? In particular, are the two samples independent?

```
# Your solution here
```