STAT S4201 001, Homework 1

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Problem 1: Ramsey 1.17

See `hw01.R` for code.

The observed difference between sample averages is 15.333, which, based on the 35 differences in the randomization distribution, corresponds to a two-sided p-value of 0.0867.

Problem 2: Ramsey 1.21

(a) A Trial of Wound Irrigation in the Initial Management of Open Fracture Wounds

   i. Link: http://www.nejm.org/doi/full/10.1056/NEJMoa1508502

  ii. Study design and conclusions:
    asdfasdf

 iii. Categorize the study according to Display 1.5.
    asdfasdf

 iv. Determine whether inferential statements are limited to or go beyond the scope allowed in Display 1.5.
    asdfasdf

(b) A Randomized, Controlled Trial of an Aerosolized Vaccine against Measles

   i. Link: http://www.nejm.org/doi/full/10.1056/NEJMoa1407417

  ii. Study design and conclusions:
    asdfasdf

 iii. Categorize the study according to Display 1.5.
    asdfasdf

 iv. Determine whether inferential statements are limited to or go beyond the scope allowed in Display 1.5.
    asdfasdf

Problem 3: Ramsey 1.25 (b)

See Figure 1.

Problem 4: Use the data from Problem 3 to answer the following questions.

(a) Set up the null and alternative hypotheses to address the research question described.

- Test statistic $t = \bar{A} - \bar{B}$, where $\bar{A}$ and $\bar{B}$ are the average Zinc concentrations in the rats of group A and B, respectively.
- Null hypothesis: $t = 0$
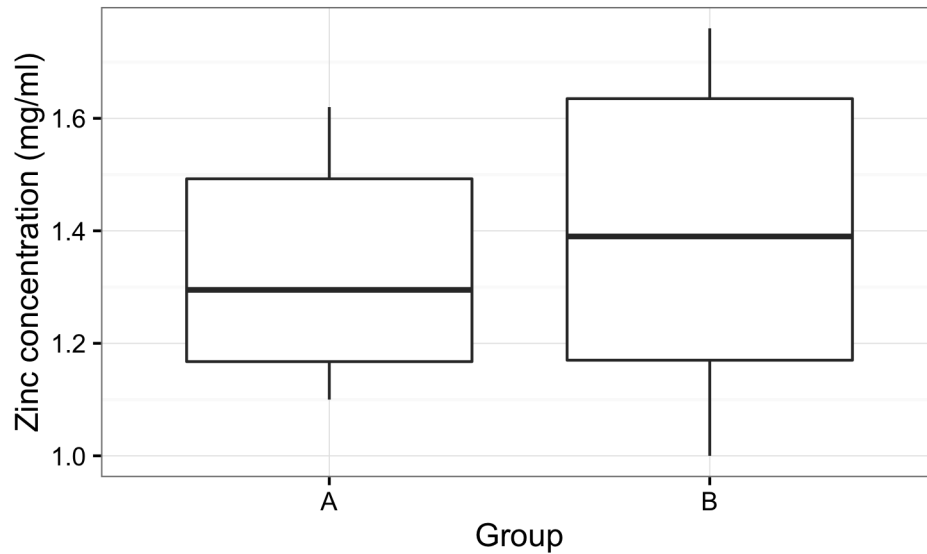- Alternative hypothesis: $t \neq 0$

Figure 1: Zinc concentrations (in mg/ml) in the blood for two groups of rats. Group A received a calcium supplement and Group B did not.

(b) Use 1,000 simulations to perform a randomization test for testing the hypothesis in (a). What is your p-value?

The observed difference between sample averages is -0.07755, which, based on the 1,000 simulations in the randomization distribution, corresponds to a two-sided p-value of 0.261.

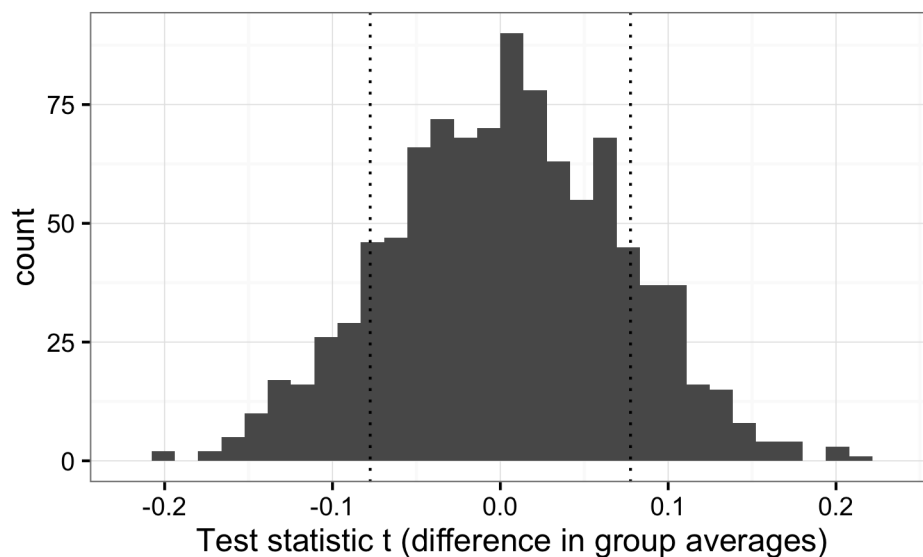(c) Draw the reference distribution of your test statistic based on 1,000 simulations.

See Figure 2.

Figure 2: Reference distribution of t, based on 1,000 simulations.

(d) Write a brief summary of your findings and possible recommendations for the researchers.

problem
4d

Problem 5: question name

(a) asdf asdf asdf

```
> apply(rawData, 2, mean)
      x1        x2        x3        x4        x5
 6.049104 -8.277221  4.665532  7.914270 62.138753
```

(b) asdfasdfasdf

i. asdf asdf asdf asdf

```
> apply(rawData, 1, mean)
  [1]  -0.1277116  20.8162864  -8.8984358  25.5999204  -9.7472153
  [6]  64.0626702  22.0392371  23.3914888  31.7598224 -13.8680290
...
 [91]   1.2105932  21.2145724  -8.4896595  19.0639963  20.9767512
 [96]   3.5962333  22.3461063   0.7145014   6.3080005  64.8829556
```

Problem 6: question name 2

(a) Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

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Todo list