

R: A Hitchhikers Guide to Reproducible Research

- **Complicated**

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What this section won't tell you!

- You will **not** know when to apply a t-test, ANOVA etc.
 - You will know how to apply a test
- You will **not** know how to interpret the outputs
 - You will know how to access them
- You will **not** become an expert performing statistical analyses through R
 - You will have a starting point to move forward
 - You will realise that the p-value is the just tip of the data analysis pipeline!

One sample t.test as an initial example

- While the input data to models needs to be tidy, unfortunately the models outputs are less than neat

```
> x <- c(2, 5, 5, 7, 8, 10, 14, 15, 23, 34)
> t.test(x, mu = 5)
```

Input data

Function call

```
One sample t-test

data:  x
t = 2.3614, df = 9, p-value = 0.0425
alternative hypothesis: true mean is not equal to 5
95 percent confidence interval:
 5.306799 19.293201
sample estimates:
mean of x
 12.3
```

Output

Broom package tidies up the output

- The broom package will take the outputs of your test and place them in an easy to access table

```
> tidy(t.test(x, mu = 5))
  estimate statistic    p.value parameter conf.low conf.high
1    12.3    2.3614 0.04250372          9 5.306799 19.2932
  method alternative
1 one sample t-test two.sided
> t_test_df <- tidy(t.test(x, mu = 5))
> |
```

	estimate	statistic	p.value	parameter	conf.low	conf.high	method	alternative
1	12.3	2.3614	0.04250372	9	5.306799	19.2932	One Sample t-test	two.sided

Walkthrough

- `03_basic_mathematical_operations.R`
- `04_linear_models`
- `05_practice_worksheet`

Where to go from here?

- Understanding basic statistical concepts

www.khanacademy.org

- Collection of YouTube videos describing statistics through R

<http://rafalab.github.io/pages/harvardx.html>

- You know what you want to do, but don't know how to do it

<https://stats.stackexchange.com/>

Structured training.....

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