R Markdown Introduction

Plan:

- Introductions
- Syllabus
- What is machine learning?
- R Setup instructions
- R, Rmarkdown Review
- Overview of Statistical Learning

Markdown

A simple markup language

Markdown allows us to format text. Markdown can be compiled directly into a PDF, a Word file or an HTML file.

For this class we only care about some basic formatting:

- Creating a list

Bolding text
Italicizing text

The **quick** brown fox jumps over the *startled* gopher

Creating a larger header

Creating a second-level header

There are several good resources for Markdown and R: * Markdown Cheatsheet * Markdown Reference Card

Why Notebooks?

R Markdown Notebooks allow us to write text, write code and generate results within a single file. In this class all in-class assignments and homework assignments will be submitted using Markdown Notebooks.

How to use markdown

When you see a white background you are writing text. You can use Markdown (or LaTeX) here. However we will also be interested in writing code to explore and summarize data. Code is placed in a *chunk*. Chunks start and end with three grave accents (the same key as the tilde): ‘‘‘

`chunks` are interactive and allow to you run code. When you execute code within the notebook, the results appear beneath the code.

Try executing the following chunk by clicking the *Run* button (play button) within the chunk or by placing your cursor inside it and pressing *Cmd+Shift+Enter*.

```
# Take the square root of 49
# NOTE: we cannot use markdown in code chunks.
# Here # means that we are creating a comment (notes that are not executable code).
# We are not creating a header. Note that comments can run off the page if too longgggggggggggggggggggg

sqrt(49)
```

```
## [1] 7
```

Exercise 1

Expanding this notebook, complete the following tasks:

1) Create three new code chunks (using the green ‘Insert’ button in the top right, or by pressing *Cmd+Option+I*).
2) In the first chunk find the sum of 75, 83, 93, 34, 75 and 81.

3) In the second chunk divide 75 by 5, then add 43 and then multiply 6
4) In the third chunk compute the average (mean) of the values entered in the first chunk. Note: searching the book and the internet will be very important in this class. You might find useful information here

```
chunk1<-sum(75,83,93,34,75,81)
```

```
((75/5)+43)*6
```

```
## [1] 348
```

```
mean(chunk1)
```

```
## [1] 441
```

Exercise 2

1) Are the following chunks different? Why or why not? Chunks are the same.

```r
7 * 5 / 8 * 3
```

```
## [1] 13.125
```

```r
7 * (5 / 8) * 3
```

```
## [1] 13.125
```

2) Evaluate

$$\left| \frac{5^{25-2}}{6-4+1*2} \right|$$

Hint: use '^' to exponentiate. Look up the function to calculate an absolute value on https://www.statmethods.net/management/functions.html

```r
abs((5^(25-2))/(6-4+(1*2)))
```

```
## [1] 2.980232e+15
```

Prepare for submission

You will submit all assignments and problem sets as PDFs. You create a PDF you will click the down arrow to the right of the *Knit* button and select *Knit to PDF*