HW 1, STAT 452
Due: Thursday, February 11

Reading:
Chapter 2, pp. 15–29, and Chapter 3, pp. 59–71, from *An Introduction to Statistical Learning*
Chapters 1 and 4 from *Hands-on Machine Learning*

Directions: Please submit your completed assignment to Blackboard. The assignment should be completed using R Markdown and rendered to an HTML or PDF format. Note that Blackboard will not accept HTML files. One workaround is to first zip your HTML file, and then submit the zipped file to Blackboard.

You will need the following R packages to complete this homework assignment:

```
library(tidyverse) # load tidyverse packages (ggplot2, dplyr, ...)
library(AmesHousing) # load Ames housing data set
```

If this is your first time using these packages you will need to install them on your machine using the `install.packages()` function.

Next run the following code to set up the Ames housing data frame:

```
ames <- make_ames()
```

Exercise 1

(a) Use `ggplot2` to make a scatterplot with `Sale_Price` on the y-axis and `TotRms_AbvGrd` on the x-axis. Use `geom_smooth()` to add the least squares line.

(b) Use the `lm()` function to fit a simple linear regression model with `Sale_Price` as the response variable, and `TotRms_AbvGrd` (total rooms above ground, excluding bathrooms) as the predictor variable. Use the `summary()` function to print the results.

(c) Provide an interpretation of the slope of the model. Also interpret the coefficient of determination (R^2).

(d) Compute a 95% confidence interval for β_1. [Hint: use `confint()`]

(e) Predict `Sale_Price` for a property with `TotRms_AbvGrd = 8`.