

## ECE 492-45 Homework 1

### Material Covered: Machine Learning Overview, Basic commands of R

Coding Environment Setup: Please install R, the core statistical programming language, and RStudio, an integrated development environment (IDE) for R. I suggest you use RStudio for the purpose of this course since it allows you to complete the tasks more efficiently.

**Problem 1** (20 points) Complete *ISLR-2.3 Lab: Introduction to R*. Please write a report, include source code, plots, and provide concise explanation for nontrivial commands and results. For example, what does `attach()` do? In what cases do we need to use `as.factor()`? What do various components of a boxplot mean? Additional hints:

- Data files such as `Auto.data` and `Auto.csv` can be downloaded from ISLR's webpage: <http://faculty.marshall.usc.edu/gareth-james/ISL/data.html>
- When data files are loaded, they should be placed in the same folder as displayed in the bottom-right panel of the RStudio.
- Try not to reuse a variable name to avoid difficult-to-debug issues. For example, `auto = na.omit(auto)` is bad. Try `auto = na.omit(auto_raw)` instead.
- To finish executing the `identify()` function, you need to click the "Finish" button at the top-right corner of the plot for which the function is called.
- Function `q()` for exiting R may not work in RStudio.

**Problem 2** (20 points) Complete *ISLR-2.4.8* and write a report.

**Problem 3** (20 points) Finish watching the remaining part of the video *NOVA Wonders Can We Build a Brain?* Write a concise summary for Machine Learning/Artificial Intelligence from both the technical perspective and the ethical perspective. Use one paragraph of 3–5 sentences to elaborate each perspective.