

# Homework 5

**Due:** 11.59pm on Sunday, March 1

**Submission instructions:**

- Submit one write-up per group on gradescope.com. Please do not bring printouts of your solutions to the classroom.

## Question 1

**Note:** *This is the problem 9.7 (page 371) from the ISLR book.*

You will use support vector approaches in order to predict whether a given car gets high or low gas mileage based on the `Auto` data set.

```
library(ISLR)
data(Auto)
```

- (a) Create a binary variable that takes on a 1 for cars with gas mileage above the median, and a 0 for cars with gas mileage below the median.
- (b) Fit a support vector classifier to the data with various values of `cost`, in order to predict whether a car gets high or low gas mileage. Report the cross-validation errors associated with different values of this parameter. Comment on your results.
- (c) Now repeat (b), this time using SVMs with radial and polynomial basis kernels, with different values of `gamma` and `degree` and `cost`. Comment on your results.
- (d) Make some plots to back up your assertions in (b) and (c).