

CMSE 381: HW7

- 1 (20 pts) Given the common linear regression model assumption, $Y = X^T\beta + \epsilon$, with $\epsilon \sim N(0, \sigma^2)$ and $X \in \mathbb{R}^p$. Given a set of training data $\{(x_1, y_1), \dots, (x_n, y_n)\}$, prove that C_p and AIC are equivalent. Namely, a model with smallest C_p score will also have the smallest AIC.
- 2 (10 pts) We perform best subset, forward stepwise, and backward stepwise selection on a single data set. For each approach, we obtain $p + 1$ models, containing $0, 1, 2, \dots, p$ predictors. Which of three models with k predictors has the smallest training RSS?
- 3 (20 pts) Exercise 6.8.3 (Textbook ISLR Chapter 5.4 Question 1)
- 4 (Challenging not required) Exercise 6.8.5
- 5 (Challenging not required) Exercise 6.8.7
- 6 (30 pts) Exercise 6.8.8
- 7 (20 pts) Exercise 6.8.9 (a-d)