Math 342W/642/742W

Recitation – Day #5 (2.13.25)

I. Multinomial Classification

(i) What is the output space, $\mathcal{Y}$, for the response variable in the context of *multinomial classification* problems?

(ii) What is the *null model*, g_0, in the context of *multinomial classification* problem?

(iii) What is the *L1 loss*? *L2 loss*?

II. Regression

(i) What is the output space, $\mathcal{Y}$, for the response variable in the context of *regression*?

(ii) What is the *null model*, g_0, in the context of *regression*?

(iii) What is the candidate set of functions, $\mathcal{H}$, in the context of *regression*?

(iv) Define the following errors:

- Sum of Absolute Errors (SAE):

- Sum of Squared Errors (SSE):

III. Simple Linear Regression

(i) Suppose $p = 1$ for linear regression, define the following:

- $\mathcal{H}$:
- $\hat{y}$:
- Objective function:
- $\mathcal{A}$:

(ii) Derive the bias term b_0 in simple OLS:

(iii) Derive the weight b_1 in simple OLS: