Section 4C. Logistic Regression

Statistics for Data Science

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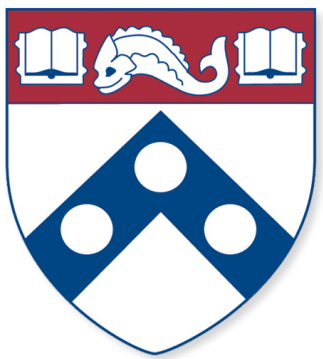
Logistic Regression

- **Logistic function**:
  - Consider a binary classification problem, e.g., $\mathcal{C} = \{0, 1\}$, and a one-dimensional input $x \in \mathbb{R}$ (i.e., $p = 1$)
  - In logistic regression, we assume the following parametric representation of the (true) conditional class probabilities:

$$p_1(x; \beta_0, \beta_1) = \Pr(Y = 1 | X = x; \beta_0, \beta_1) = \frac{e^{\beta_0 + \beta_1 x}}{1 + e^{\beta_0 + \beta_1 x}}$$

$$p_0(x; \beta_0, \beta_1) = \frac{1}{1 + e^{\beta_0 + \beta_1 x}}$$

  - What is the shape of this function?



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