AMS 580 Extra Credit 8/11

Mustafa Isik
113080465

- When single output binary class, if NN has 1 output vertex whereas 2 (binary) classes, we would have SSE loss and CE loss equal to each other.

- When output vertex uses "identity" act. func. and each input vertex belongs to exactly only one class, SSE loss and CE loss would be equalized

⇒ During the mentioned special cases above, there are possibilities of having "SSE Loss = CE Loss"

★ SSE Loss = CE Loss

$(y_i - \hat{y}_i)^2 \quad = \quad -y_i \cdot \ln(\hat{y}_i) - (1-y_i) \cdot \ln(1-\hat{y}_i)$

$\Rightarrow y_i^2 - 2y_i\hat{y}_i + \hat{y}_i^2 = -y_i \ln(\hat{y}_i) - (1-y_i)\ln(1-\hat{y}_i)$

$\Rightarrow y_i^2 + y_i \ln(\hat{y}_i) + (1-y_i)\ln(1-\hat{y}_i) = 2y_i\hat{y}_i + \hat{y}_i^2$