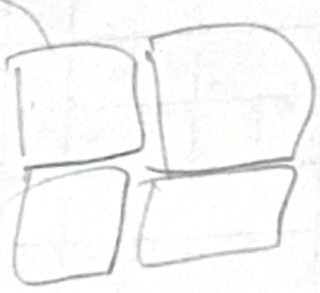
Connor Roare | 11/30/2024 | EE

week 4 inclass activity

$$X = \begin{bmatrix} 1 & 0 & 1 & 0 & 1 \\ 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 1 & 1 \\ 1 & 0 & 0 & 1 & 0 \end{bmatrix} \quad K = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$$

2.(a) 3 dimensional Y

2(b) $Y = \begin{bmatrix} 4, 3, 2 \\ 3, 2, 9 \\ 2, 4, 1 \end{bmatrix}$



2.(c) 2 dimensional P

2.(d) $P = \begin{bmatrix} 12/4, 11/4 \\ 11/4, 11/4 \end{bmatrix}$ $P = \begin{bmatrix} 3, 11/4 \\ 11/4, 11/4 \end{bmatrix}$

3. $\text{Softmax}(a_i) = \frac{\exp(a_i)}{\sum_{k=1}^{p} \exp(a_k)}$ [2, 0, -1]

3.B. predicted class = index 1

e^2 e^0 e^{-1}

7,38905 1 0,367879441

7,38905 / 8,7569 | 1 / 8,7569 | 0,36788 / 8,7569

(0,8413, 0,114, 0,042) = 8,7569

3.A. softmax = (0,843, 0,114, 0,042)

Connor Kuane | 1/30/2026 | EE467

Week 4 in class activity

1.(a) There should be two classes, one for schoolbus one for not schoolbus

1.(b), Convert the 30x30 into 9 10x10x3 tiles (the tiles of each seperate image)

1(c) CNN input dimension is 10x10x3, we will put one at a time in. What will be fed in is a single image. (10, 10, 3)

1.(d) CNN output dimension is 2, probability of bus and probability not bus. (1, 2) softmax

1(e) Then through softmax you see whichever is greater, the label

The larger value is assigned as the label for the tile,