

Matrix Multiplication II

$$\begin{bmatrix} 1 & 3 & 2 \\ 4 & 0 & 1 \end{bmatrix}_{2 \times 3} \begin{bmatrix} 1 & 3 \\ 0 & 1 \\ 5 & 2 \end{bmatrix}_{3 \times 2} = \begin{bmatrix} 11 & 10 \\ 9 & 14 \end{bmatrix}_{2 \times 2}$$

$$A \times B = C$$

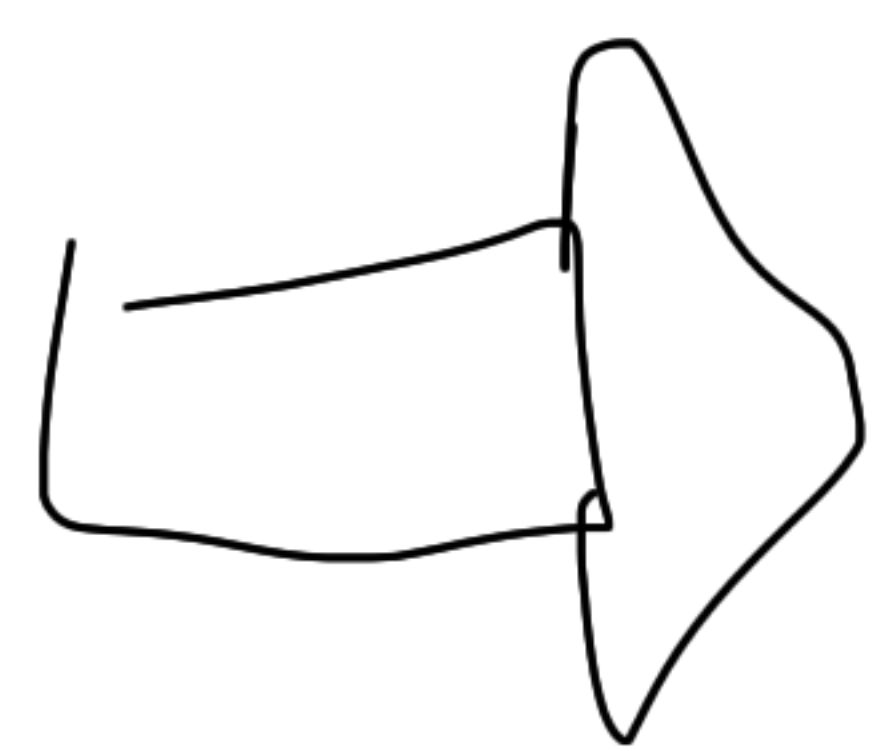
$\begin{bmatrix} & \end{bmatrix}_{m \times n}$
 $\begin{bmatrix} & & & \end{bmatrix}_{n \times o}$
 $\begin{bmatrix} & & & \end{bmatrix}_{m \times o}$

for vectors:
 $o=1$

Assume feature x and 3 hypothesis $h^1_\theta(x)$, $h^2_\theta(x)$, $h^3_\theta(x)$

$$\begin{bmatrix} 1 & 2104 \\ 1 & 1604 \\ 1 & 510 \\ 1 & 1203 \end{bmatrix}_{4 \times 2} \times \begin{bmatrix} -40 & 200 & -150 \\ 0.25 & 3 & 0.4 \end{bmatrix}_{2 \times 3} = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}_{4 \times 3}$$

$-40 + 0.25x$
 $200 + 3x$
 $-150 + 0.4x$



Test all 3 hypotheses

on your data set with
matrix multiplication

Note: Mat-Mul is not commutative ($A \times B \neq B \times A$)

but $(A \times B) \times C = A \times (B \times C)$ [associative]

Further: $I = \begin{bmatrix} 1 & & 0 \\ & \ddots & \\ 0 & & 1 \end{bmatrix}$

For any matrix A ,

$$A \times I = I \times A = A$$