Basics of Neural Network Programming

Vectorization

What is vectorization?

$$z = \underline{w^T x} + b$$

$$w = \begin{bmatrix} \vdots \\ \vdots \end{bmatrix} \quad x = \begin{bmatrix} \vdots \\ \vdots \end{bmatrix}$$

$$w \in \mathbb{R}^{n_x}$$
$$x \in \mathbb{R}^{n_x}$$

Non-vectorized:

```
z = 0
for i in range(n-x):
    z += w[i] * x[i]

z += b
```

Vectorized

$$z = np.\underline{dot}(w,x) + b$$
$$\underbrace{\qquad\qquad}_{w^T x}$$

→ GPU } SIMD - single instruction
→ CPU } multiple data.

Andrew Ng