Multiclass CE

Multi-Class
Cross-Entropy

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Cross-Entropy

ANIMAL	DOOR 1	DOOR 2	DOOR 3
	0.7	0.3	0.1
	0.2	0.4	0.5
	0.1	0.3	0.4
	1	1	1

Multi-Class Cross-Entropy

ANIMAL	DOOR 1	DOOR 2	DOOR 3
	0.7	0.3	0.1
	0.2	0.4	0.5
	0.1	0.3	0.4

$P = 0.7 * 0.3 * 0.4 = 0.084$
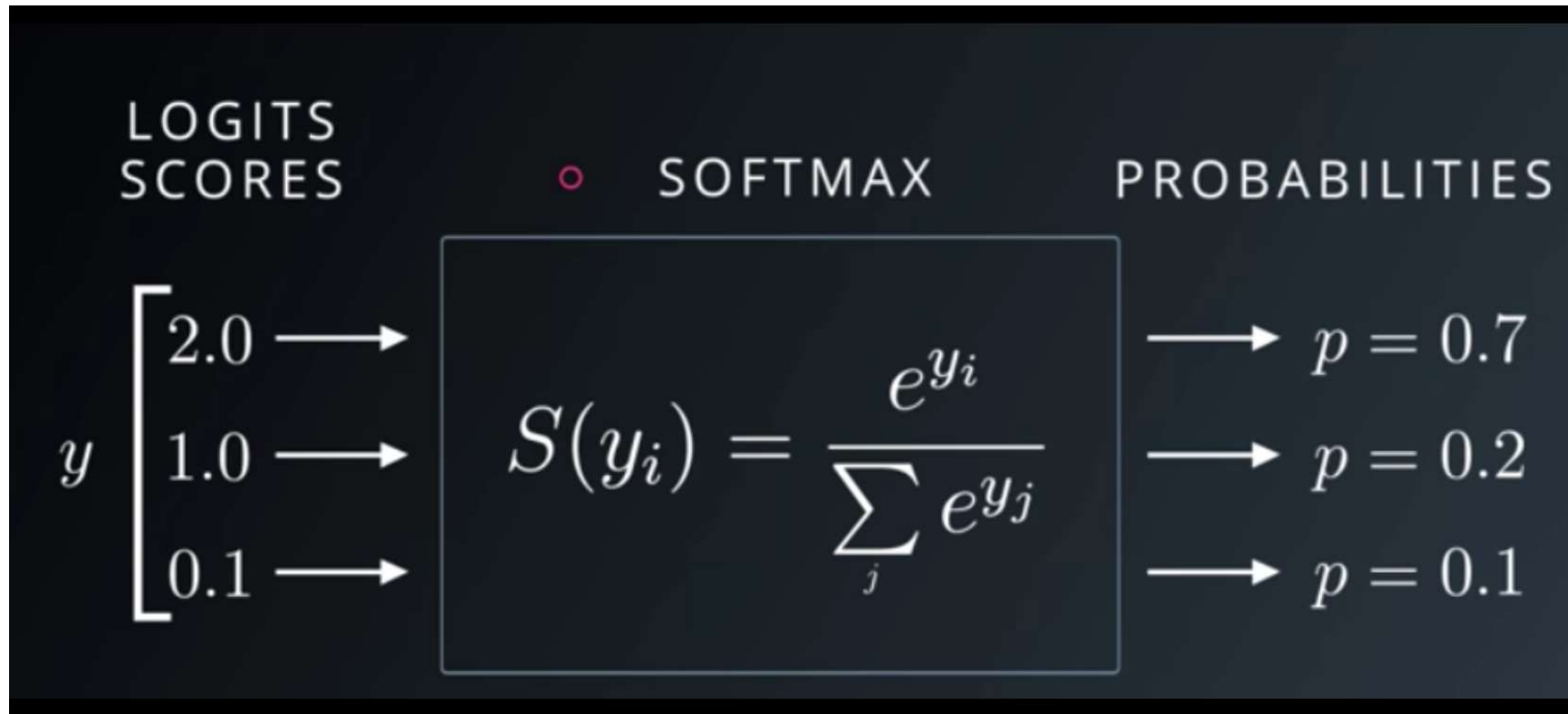
$CE = -\ln(0.7) + -\ln(0.3) + -\ln(0.4) = 2.48$

Multi-Class Cross-Entropy

ANIMAL	DOOR 1	DOOR 2	DOOR 3
🦆	p_{11}	p_{12}	p_{13}
🦫	p_{21}	p_{22}	p_{23}
🦭	p_{31}	p_{32}	p_{33}

$y_{1j} = 1$ if 🦆 behind 🚪j

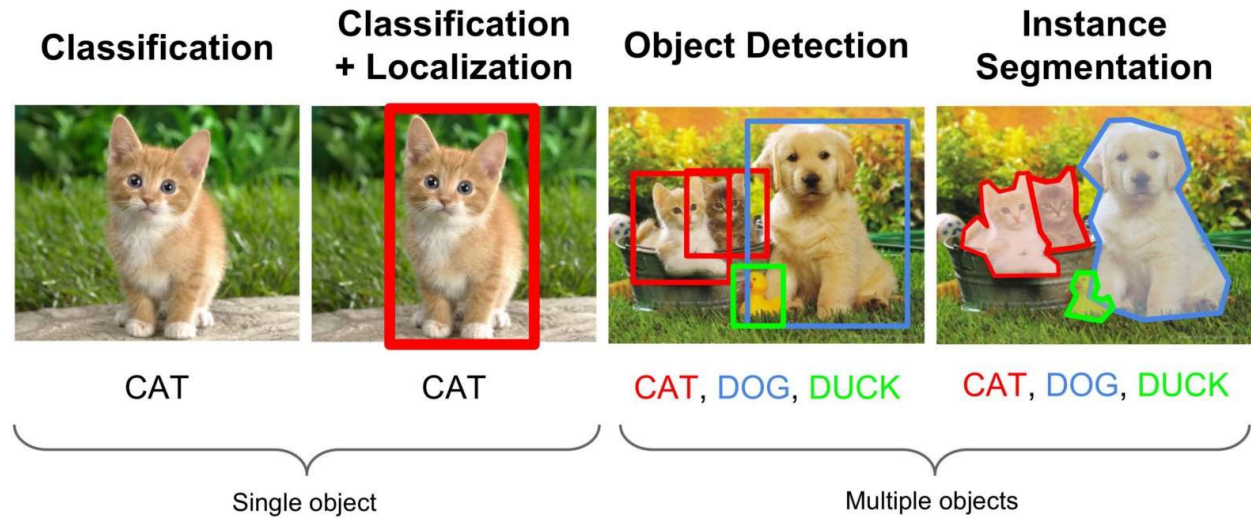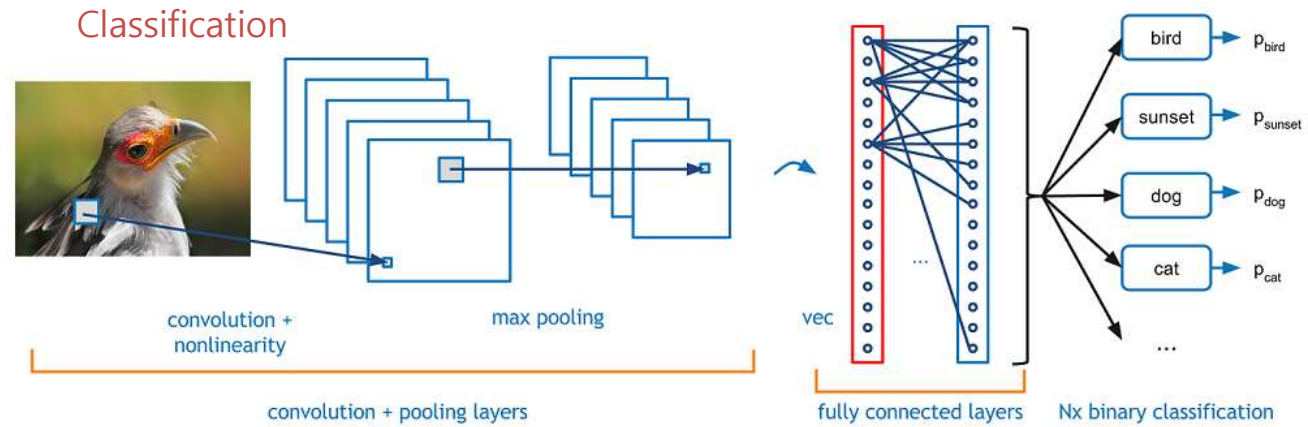$y_{2j} = 1$ if 🦫 behind 🚪j

$y_{3j} = 1$ if 🦭 behind 🚪j

$$\text{Cross-Entropy} = -\sum_{i=1}^{n}\sum_{j=1}^{m} y_{ij}\, \ln(p_{ij})$$

SoftMax

What is Classification?

- Classification vs.
- Localization
- Detection
- Segmentation

Confusion Matrix in Numeric

Truth

Predicted	Asphalt	Concrete	Grass	Tree	Building	Total
Asphalt	2385	4	0	1	4	2394
Concrete	0	332	0	0	1	333
Grass	0	1	908	8	0	917
Tree	0	0	0	1084	9	1093
Building	12	0	0	6	2053	2071
Total	2397	337	908	1099	2067	6808

Confusion Matrix in %