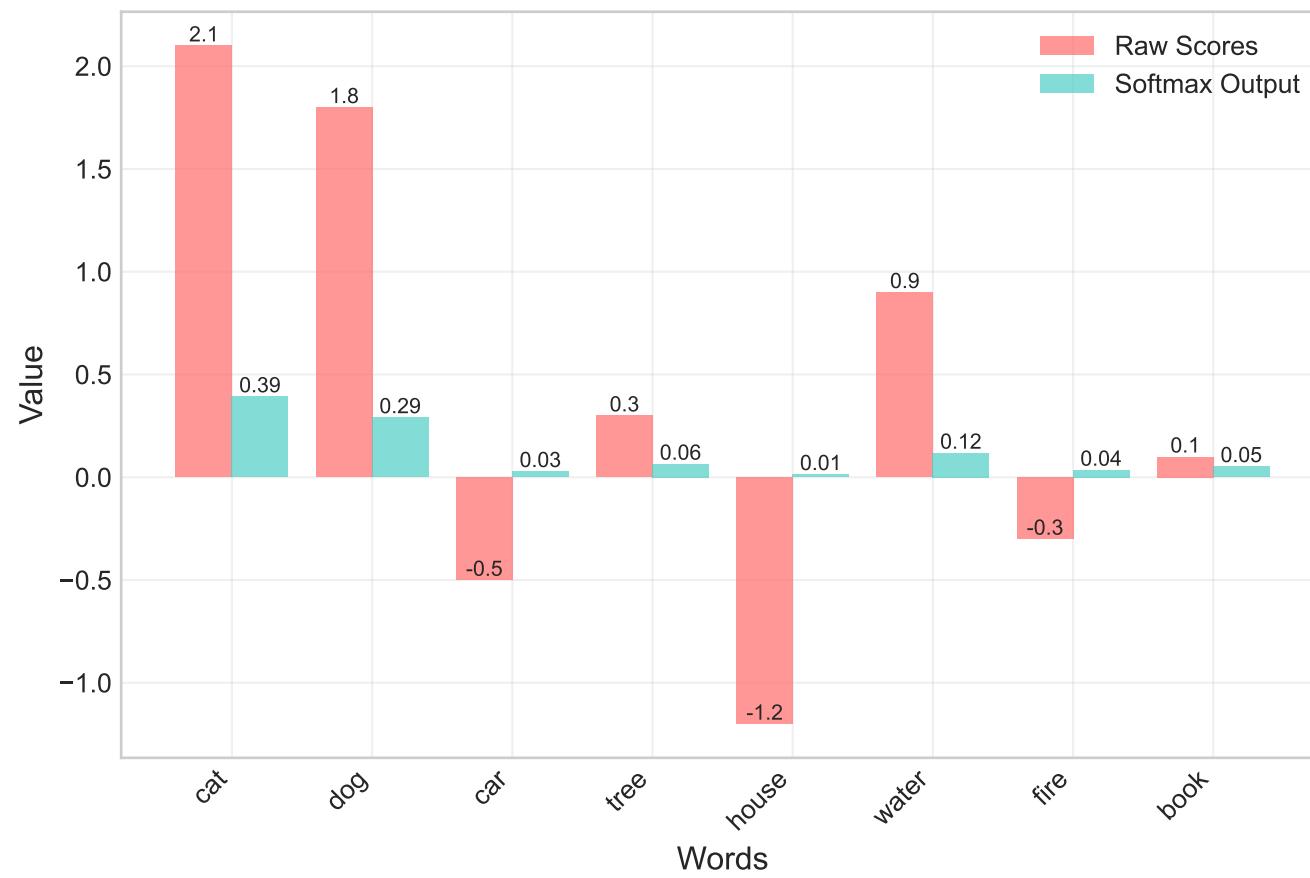
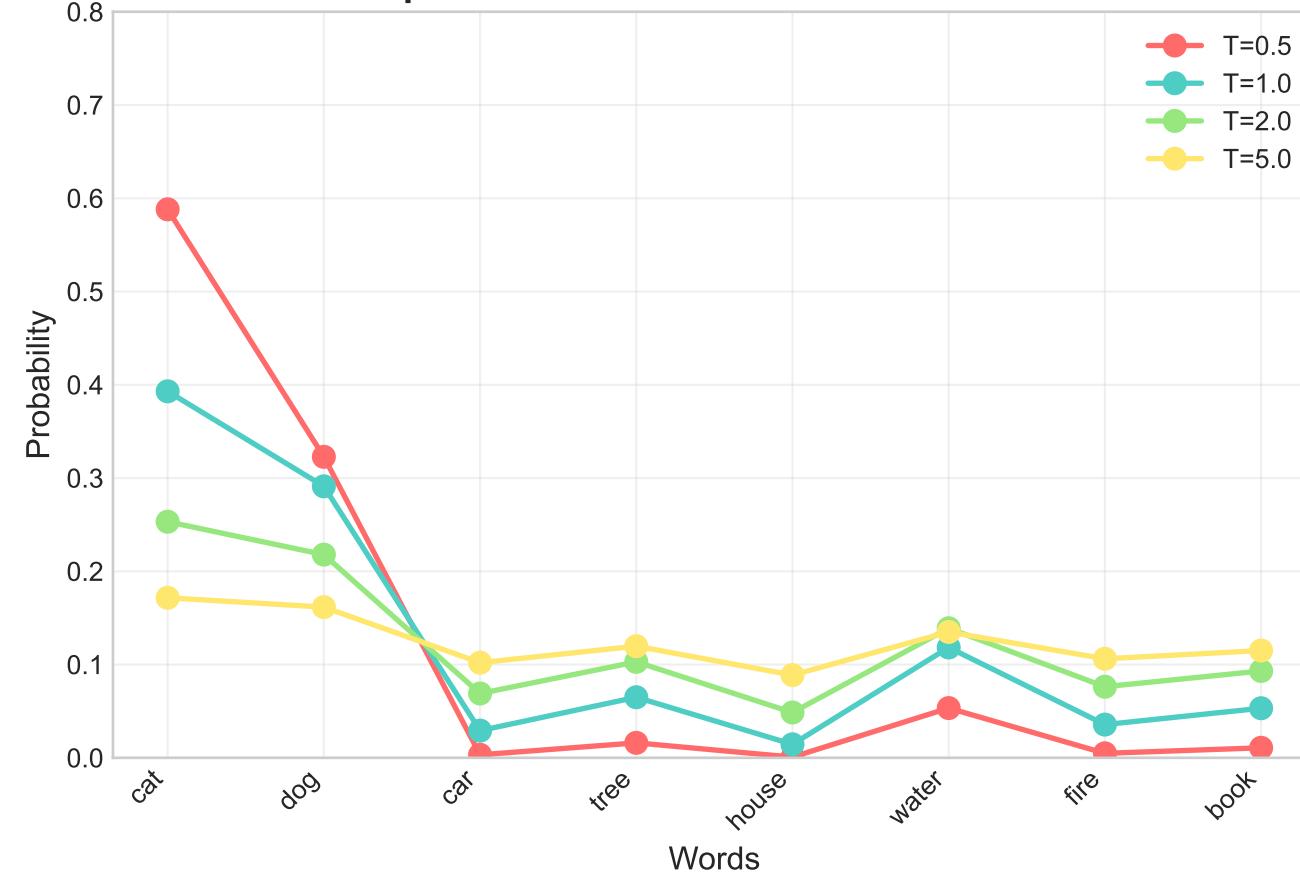


Softmax Function: Converting Scores to Probabilities

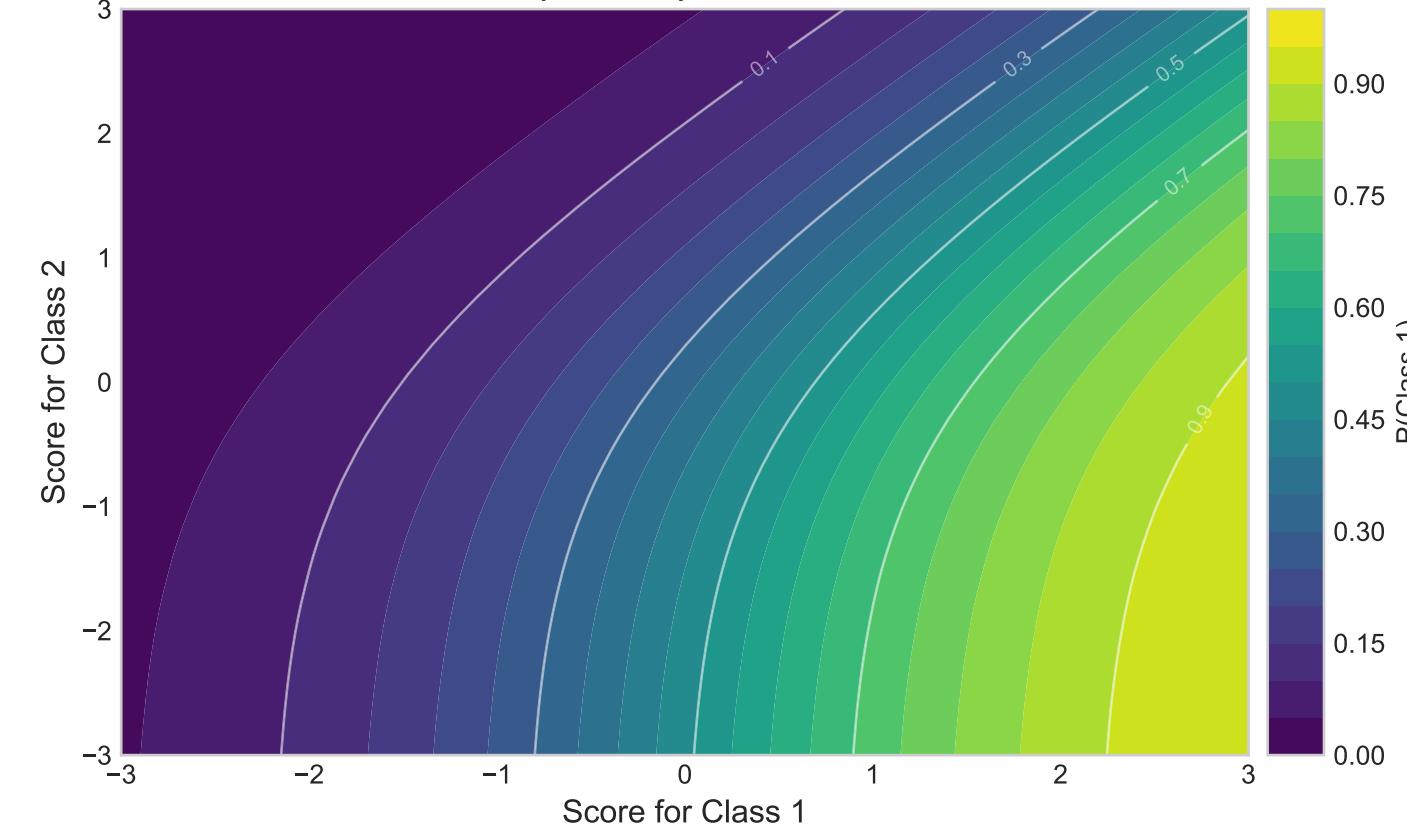
Softmax Transformation: Scores → Probabilities



Temperature Effect on Softmax Distribution



2D Softmax: P(Class 1) with Class 3 fixed at 0



Softmax Formula:

$$\text{Softmax}(x_i) = \frac{e^{x_i}}{\sum_{j=1}^n e^{x_j}}$$

Example Calculation:

Input scores: [2.0, 1.0, 0.1]

Step 1: Exponentiate
 $\exp(2.0) = 7.39$
 $\exp(1.0) = 2.72$
 $\exp(0.1) = 1.11$

Step 2: Sum = $7.39 + 2.72 + 1.11 = 11.22$

Step 3: Normalize
 $P_1 = 7.39/11.22 = 0.66$
 $P_2 = 2.72/11.22 = 0.24$
 $P_3 = 1.11/11.22 = 0.10$

Output: [0.66, 0.24, 0.10] (sum = 1.0)

- Key Properties:
- Output range: [0, 1]
 - Sum to 1.0
 - Preserves order
 - Differentiable