

## Top-k Example: k=3

### 1. Original Probabilities

cat: 0.45  
dog: 0.18  
bird: 0.15  
fish: 0.10  
mouse: 0.08  
...: 0.04

→

**cat: 0.45**  
**dog: 0.18**  
**bird: 0.15**  
*(discard rest)*

→

Sum =  $0.45 + 0.18 + 0.15 = 0.78$

cat:  $0.45/0.78 = 0.58$

dog:  $0.18/0.78 = 0.23$

bird:  $0.15/0.78 = 0.19$

**Result: Sample from {cat: 58%, dog: 23%, bird: 19%}**

*Prevents sampling from long tail ("mouse" eliminated)*