

Contrastive Search: How It Works

Step 1: Get Started

- city: 0.45
town: 0.18
area: 0.12

Score = $(1 - \alpha) \times P(\text{taken}) + \alpha \times \text{inactivity}$

score = $(1-\alpha) \times P(\text{token}) - \alpha \times \text{similarity}$

city: $0.4 \times 0.45 - 0.6 \times 0.2 = 0.372$

town: $0.4 \times 0.18 - 0.6 \times 0.75 = 0.33$

area: $0.4 \times 0.15 - 0.6 \times 0.65 = 0.372$

Step 2: Co

Winner: "town" (high prob, lower similarity)

- city: 0.92 (cosine similarity)
town: 0.75 (cosine similarity)
area: 0.65 (cosine similarity)
place: 0.60 (cosine similarity)

Key Insight: Balance probability (coherence) with diversity (novelty)

$\alpha=0$: Pure greedy | $\alpha=0.6$: Balanced | $\alpha=1.0$: Maximum diversity