## 🔥 Temperature in Language Models

**Definition:**

temperature controls the **randomness** of a model's output.

- **Low temperature** → more deterministic, focused, and predictable.

- **High temperature** → more random, creative, and diverse.

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## 📊 Temperature Ranges & Effects

- **0.0 – 0.3** → Deterministic, factual, predictable.

- **0.5 – 0.7** → Balanced, coherent, explanatory.

- **0.9 – 1.2** → Creative, storytelling, humor.

- **1.5-2** → Maximum randomness, wild ideas, brainstorming.

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## 🛠 Recommended Use Cases

| Use Case | Recommended Temperature |
|---|---|
| **Factual answers** (math, code, facts) | 0.0 – 0.3 |
| **Balanced response** (QA, explanations) | 0.5 – 0.7 |
| **Creative writing** (stories, jokes) | 0.9 – 1.2 |
| **Brainstorming / wild ideas** | 1.5-2 |

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## ✅ Key Insight:

- Use **lower values** when accuracy and reliability matter.

- Use **higher values** when creativity and variety are desired.