1. **Bernoulli Distribution**

- ✅ **One trial**, two outcomes: success (1) or failure (0)
- 📌 Keywords: "single coin toss", "pass/fail", "yes/no", "true/false"
- 🎯 Parameters: p (probability of success)
- 📇 Example: "A machine either works or fails in one test."

Trigger phrase: "Exactly one trial with binary outcome"

2. **Binomial Distribution**

- ✅ **Fixed number of independent Bernoulli trials**
- 📌 Keywords: "number of successes in n trials", "3 coin flips", "10 defective items out of 100"
- 🎯 Parameters: n (number of trials), p (success probability)
- 📇 Example: "What's the probability of getting 4 heads in 6 coin tosses?"

Trigger phrase: "Counting successes across multiple identical trials"

3. **Poisson Distribution**

- ✅ **Counts of events in a fixed interval (time, space, volume)**
- 📌 Keywords: "rate", "per hour", "per km²", "rare events", "calls per minute"
- 🎯 Parameter: λ (average rate)
- 📇 Example: "Probability of 3 emails arriving in an hour"

Trigger phrase: "Counting rare events over continuous time or space"

4. **Normal Distribution**

- ✅ **Continuous data, bell-shaped curve**
- 📌 Keywords: "mean and standard deviation", "approximately normal", "CLT", "z-scores"
- 🎯 Parameters: μ (mean), σ (standard deviation)
- 📇 Example: "Heights of students are normally distributed with mean 160 cm…"

Trigger phrase: "Continuous variable with symmetric spread around mean"