Patterns, Groups, and Innovation: A Discovery Journey

Pre-Class Handout - Week 1

BSc Machine Learning for Innovation
Groups of 2-3 Students

Welcome to Discovery-Based Learning!

No technical knowledge required! This handout will guide you to discover fundamental concepts about patterns, grouping, and innovation through observation and experimentation. Work in groups of 2-3 and document your discoveries.

Page 1: The Dot Cloud Mystery

Observe & Record

Take 5 minutes to study the image above. In your group, discuss and write down:

1. **What do you see in this image?**

2. **Can you identify any patterns?**

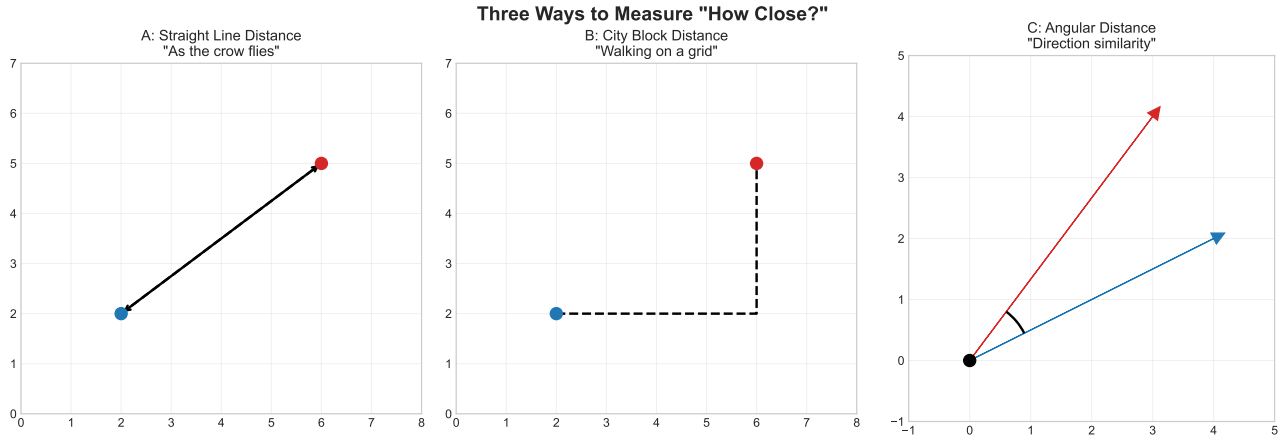
3. **How many distinct groups might there be?**

4. **What makes you think they're groups?**

Theory Question

"If you had to explain to someone what makes dots belong together, what rules would you create?"

Page 2: The Distance Concept



Discovery Exercise: "What is 'Close'?"

Imagine these 5 innovation profiles (each student has different strengths):

Student	Tech Skills	Creativity	Business	Research	Communication
Alice	8	3	5	7	4
Bob	7	4	6	8	3
Carol	2	9	3	1	8
David	3	8	2	2	9
Eve	9	2	8	6	5

Your Task:

1. **Define "similar students"** - What makes them similar?

2. **Create your own similarity rule**

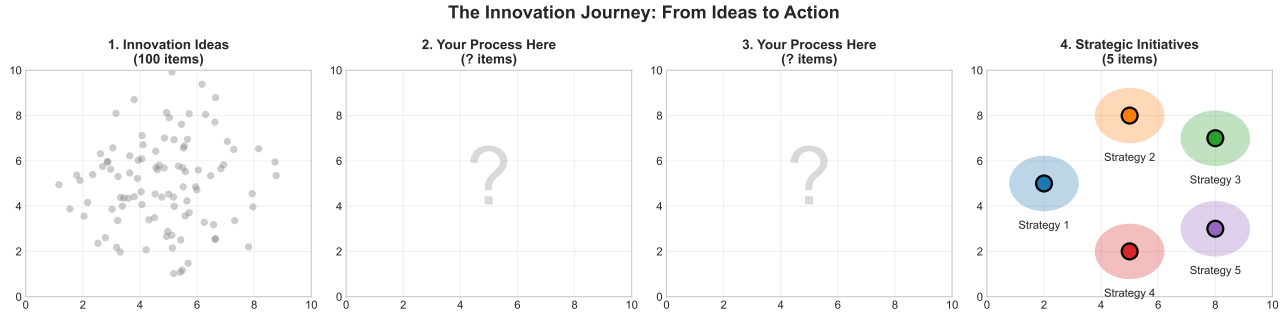
3. **Group the 5 students using YOUR rule**

4. **Document your decision process**

Theory Seeds (Don't define yet - just think about them)

- Proximity
- Similarity
- Homogeneity
- Separation
- Cohesion
- Distinction

Page 3: The Grouping Challenge



Thought Experiment

"You have 1000 innovation ideas. You need 5 strategic initiatives for the CEO."

Map Your Process

Draw or describe what happens in the blank panels (2 and 3):

Panel 2: What happens here?

Panel 3: What happens here?

Why not go directly from 1 to 4?

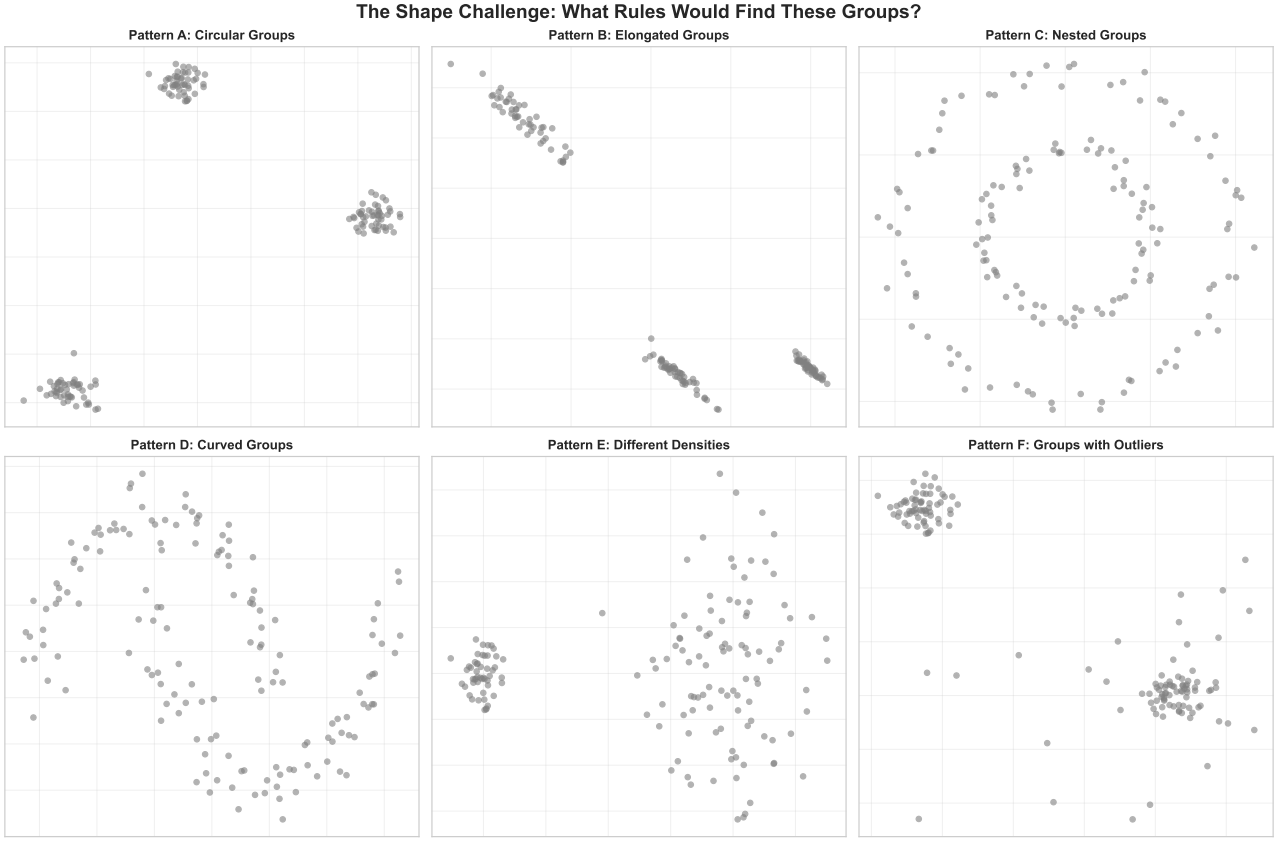
Discover the Pattern

Look at these number sequences and find the pattern:

- 1000 → ? → ? → 5
- 500 → ? → ? → 3
- 2000 → ? → ? → 7

What mathematical relationship might exist?

Page 4: Pre-Class Discovery Lab



For Each Pattern, Theorize:

1. **What rule would find these groups?**

   Pattern A: _____

   Pattern B: _____

   Pattern C: _____

   Pattern D: _____

   Pattern E: _____

   Pattern F: _____

2. **Would your rule work for all shapes?**

3. **What assumptions are you making?**

Bring to Class

- Your grouping rules (written as if teaching a computer)
- Your theory about the ??? steps in the innovation journey
- Questions about what didn't work
- Ideas about how patterns relate to innovation

Innovation Connection

Think: How do these patterns relate to:

- Finding innovation opportunities?
- Grouping similar ideas?
- Identifying strategic themes?
- Reducing complexity in decision-making?