Innovation Through Clustering:
Practical Discovery Exercises

Take-Home Innovation Challenges - Week 1

BSc Machine Learning for Innovation
Individual or Team Exercises

Exercise Objective

Apply clustering concepts to real innovation challenges. Each exercise builds from simple observation to strategic implementation. Complete at least 3 exercises for full understanding.

Exercise 1: Customer Feedback Clustering

Scenario

You're working with a food delivery startup that has 100 customer complaints from last month. They need to identify the main problem areas to prioritize fixes.

Data Sample (First 10 complaints):

1. "Food was cold when it arrived"
2. "Driver couldn't find my address"
3. "App crashed during payment"
4. "Food took 90 minutes to arrive"
5. "Missing items from my order"
6. "Payment was charged twice"
7. "Driver was rude"
8. "Food quality was poor"
9. "App wouldn't accept my coupon"
10. "Delivery time estimate was wrong"

Tasks:

A. Manual Clustering (10 min)

- Group similar complaints together
- Name each cluster (e.g., "Delivery Issues")
- Count complaints per cluster

Your Clusters:

1. Cluster Name: _____ Count: _____

2. Cluster Name: _____ Count: _____

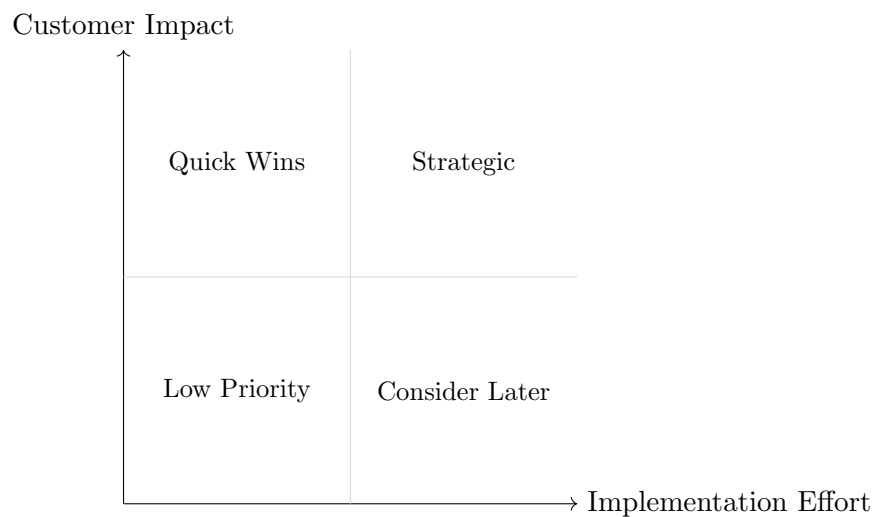3. Cluster Name: _____ Count: _____

4. Cluster Name: _____ Count: _____

B. Innovation Opportunities (10 min)

For each cluster, propose one innovation:

Problem Cluster	Innovation Solution

C. Priority Matrix (5 min)

Plot your solutions on Impact vs Effort:

Customer Impact

Quick Wins   Strategic

Low Priority   Consider Later

Implementation Effort

Exercise 2: Product Feature Space

Scenario

Your team has brainstormed 15 features for a new fitness app. You need to group them into coherent releases.

Features with Attributes:

Feature	Dev Time (weeks)	User Value (1-10)	Technical Risk (1-10)
Social sharing	2	7	3
AI coach	8	9	9
Progress graphs	1	6	2
Video tutorials	3	8	4
Meal planner	4	7	5
Heart rate monitor	2	8	6
Community forum	3	6	3
Workout library	2	9	2
Personal records	1	7	2
Music integration	2	5	4
Virtual races	5	6	7
Habit tracker	2	8	3
Coach messaging	4	7	6
Calorie counter	2	8	3
Equipment finder	3	4	5

Tasks:

A. 3D Clustering Challenge

Using the three dimensions (Dev Time, User Value, Risk), identify natural groupings:

Group 1: "_____"
Features: _____

Group 2: "_____"
Features: _____

Group 3: "_____"
Features: _____

B. Release Planning

Based on your clusters, create a 3-release roadmap:

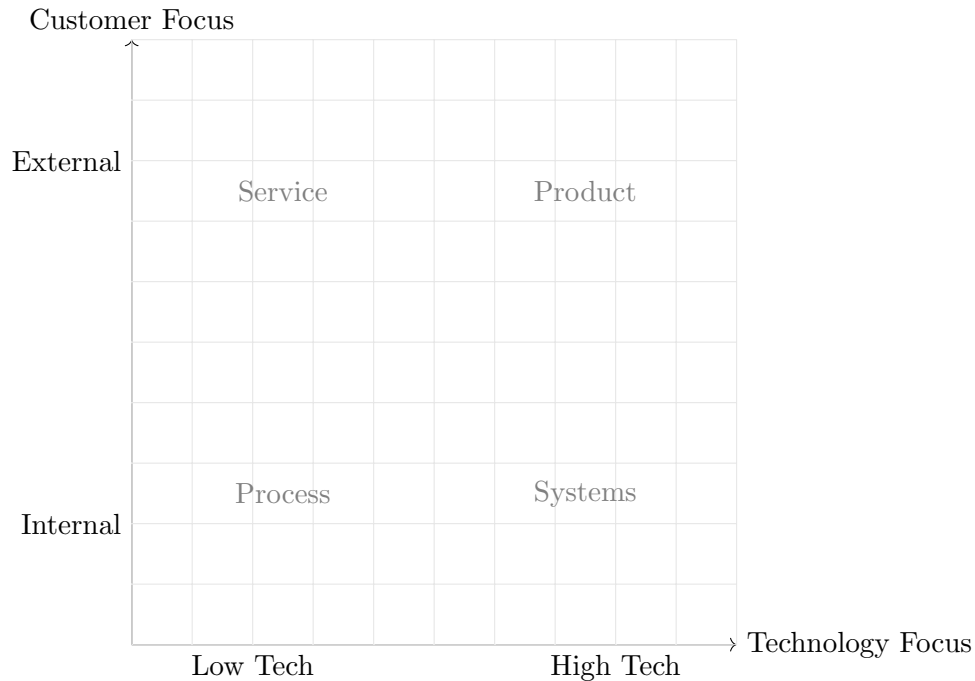| Release 1.0	Release 2.0	Release 3.0
Month 1-2	Month 3-4	Month 5-6
Features:	Features:	Features:

Exercise 3: Innovation Ecosystem Mapping

Scenario

Map your organization's innovation initiatives to find gaps and overlaps.

Innovation Dimensions:

Customer Focus

External   Service   Product

Process   Systems

Internal

Low Tech   High Tech   Technology Focus

Tasks:

A. Plot Your Initiatives

Think of 10 current or potential innovation projects in your domain. Plot them above.

B. Cluster Analysis

1. Which quadrant has the most initiatives? _____

2. Which quadrant is empty (white space)? _____

3. Do you see any natural clusters? Describe: _____

C. Strategic Insights

Gap Analysis: What innovation opportunity exists in the white space?

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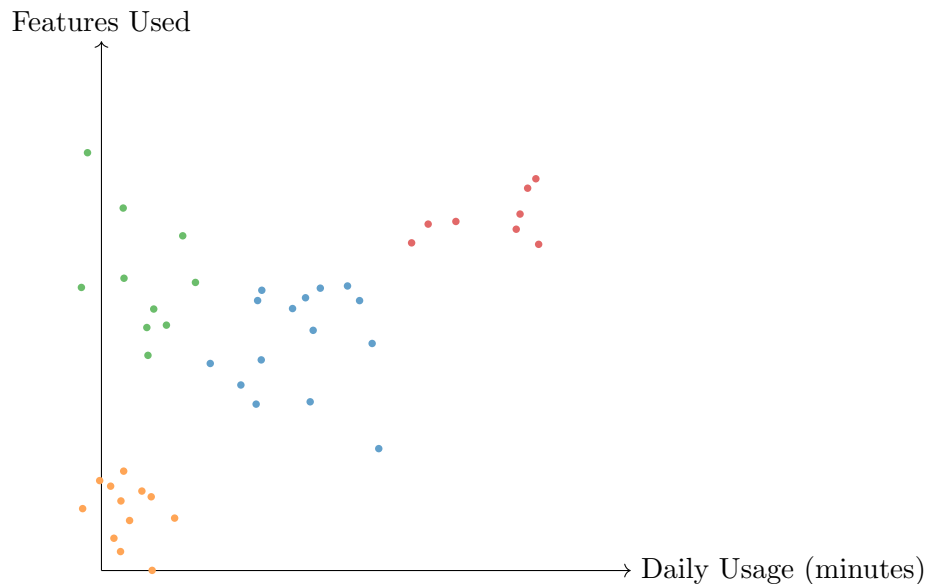**Overlap Issue:** Where are you over-investing?

Balance Strategy: How would you redistribute resources?

Exercise 4: Persona Discovery Through Behavior

Scenario

You have usage data from 1000 app users. Instead of demographics, you'll cluster by behavior.

Sample User Behaviors:

Tasks:

A. Behavioral Personas

Without knowing demographics, create personas based on the usage patterns:

Persona Name	Behavior Pattern	Likely Needs
"_____"		
"_____"		
"_____"		
"_____"		

B. Innovation for Each Persona

Design one feature specifically for each persona:

1. **Persona 1 Feature:** _____

2. **Persona 2 Feature:** _____

3. **Persona 3 Feature:** _____

4. **Persona 4 Feature:** _____

Exercise 5: Competitive Landscape Clustering

Scenario

Analyze competitors to find your unique innovation space.

Competitor Attributes Matrix:

Create your own analysis for 5 competitors in your field:

Competitor	Price Level (1-10)	Feature Count (1-10)	Market Share (%)	Innovation Rate (Updates/Year)
_____				
_____				
_____				
_____				
_____				

Tasks:

A. Strategic Groups

Based on your analysis, identify 2-3 strategic groups:

Group 1: _____
Members: _____
Strategy: _____

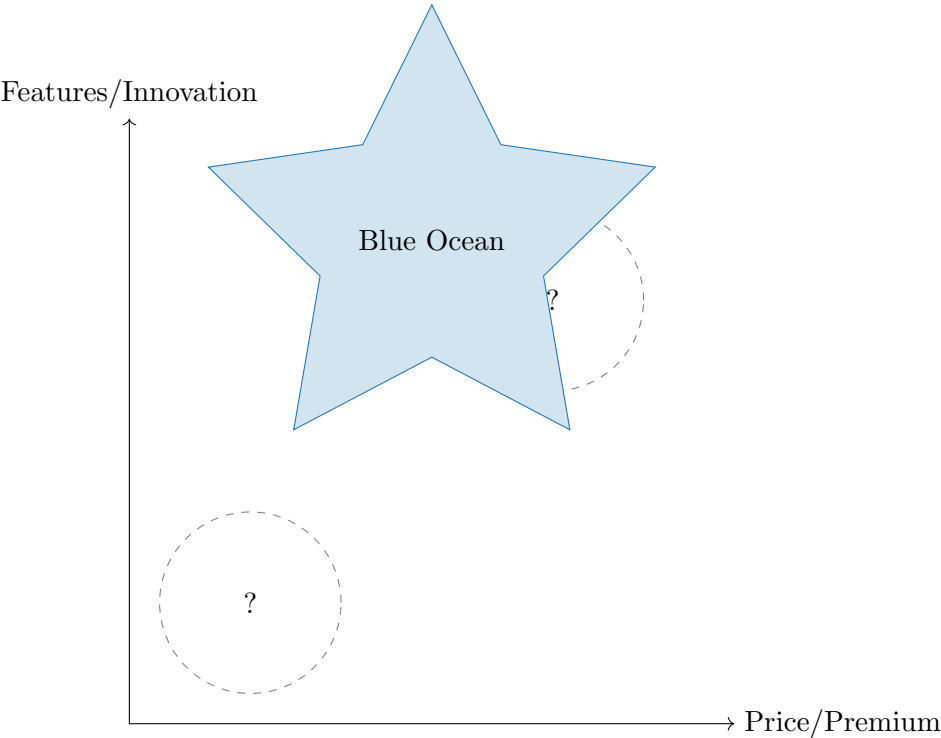**Group 2:** _____
Members: _____
Strategy: _____

Group 3: _____
Members: _____
Strategy: _____

B. Blue Ocean Discovery

Where is the uncontested market space (no cluster)?

Features/Innovation

Blue Ocean

?

?

Price/Premium

Challenge: Real-World Application

Your Innovation Challenge

Apply clustering to a real problem in your domain:

1. Problem Definition

What innovation challenge are you solving?

2. Data/Dimensions

What are you clustering? What dimensions matter?

3. Clustering Approach

How will you group items? What's your distance metric?

4. Expected Clusters

What groups do you expect to find?

5. Innovation Actions

What will you do with the clustering results?

Reflection

Learning Synthesis

Key Insight: What's the most valuable thing you learned about clustering for innovation?

Application: How will you use clustering in your next project?

Learning Synthesis