# Introduction to Decision Support Systems (DSS)

Week 1 – Definition, Scope, History, Types, and Practical Examples

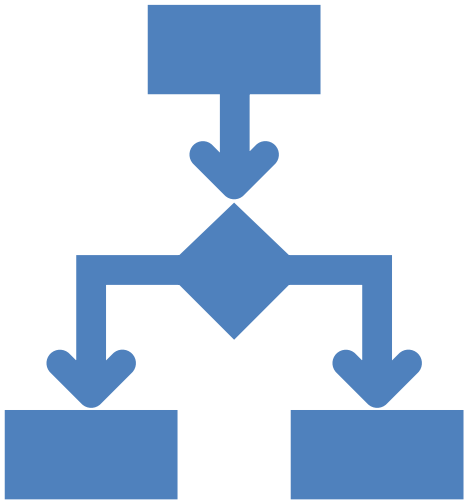
# Learning Objectives - Part 1

- Define Decision Support Systems (DSS)
- Understand their scope and purpose
- Explore real-world applications in business

# Learning Objectives - Part 2

- Understand DSS historical evolution
- Relation to MIS, EIS, ERP
- Classify DSS types
- Apply practical exercises using sample datasets

# Definition & Scope (1)

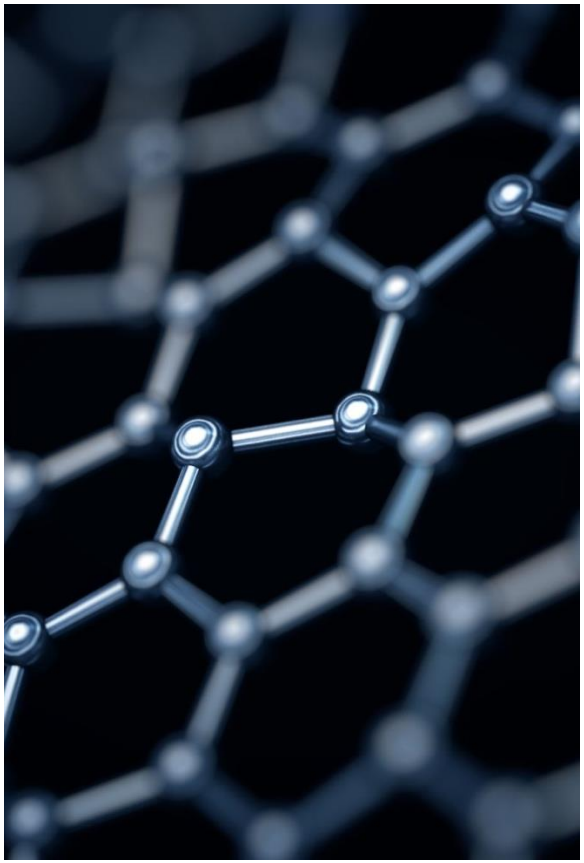


- Decision Support System (DSS) is an information system that supports business or organizational decision-making.

# Definition & Scope (2)

- DSS helps in semi-structured and unstructured problems, unlike traditional MIS which focuses on structured tasks.

# Definition & Scope (3)



## Key Characteristics:

- Supports, not replaces, decision-making
- Provides analytical tools and models
- Controlled by the user

# Definition & Scope (4)

- Scope: DSS can be applied in finance, healthcare, supply chain, marketing, government, and many other sectors.

# Definition & Scope (5)

DSS enhances decision quality, reduces decision time, and increases managerial effectiveness.

# Historical Evolution (1)

- 1960s–70s: Originated from Management Information Systems (MIS), focusing on reporting structured information.

# Historical Evolution (2)

- 1970s–1980s: DSS emerged to handle semi-structured and unstructured problems using models and data analysis.

# Historical Evolution (3)

- EIS (Executive Information Systems) in the 1980s provided dashboards and executive summaries for top managers.

# Historical Evolution (4)

- ERP (Enterprise Resource Planning) systems from 1990s onward integrated DSS capabilities across organizational functions.

# Historical Evolution (5)

- Comparison Table: MIS vs DSS vs EIS vs ERP (Features, Users, Decision Support Type).

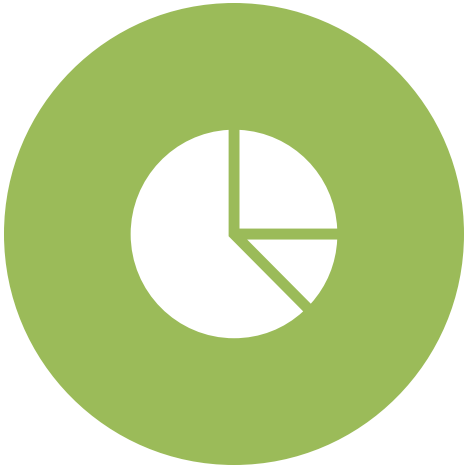
# Historical Evolution (6)

- DSS bridges the gap between raw data and managerial decision-making by combining data, models, and user interface.

# Historical Evolution (7)

Modern DSS often incorporates AI and analytics for predictive and prescriptive insights.

# Data-Driven DSS



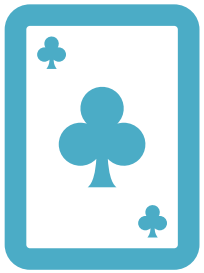
USES LARGE DATASETS, WAREHOUSES, OLAP CUBES, DASHBOARDS FOR REPORTING AND TREND ANALYSIS.

EXAMPLE: SALES DASHBOARDS, INVENTORY TRACKING.

# Data-Driven DSS - Example & Explanation

- Detailed example and scenario of Data-Driven DSS usage.
- Steps, outcomes, and benefits.

# Model-Driven DSS



Uses analytical, optimization, and simulation models to analyze 'what-if' scenarios.

Example: Financial forecasting, production planning.

# Model-Driven DSS - Example & Explanation

- Detailed example and scenario of Model-Driven DSS usage.
- Steps, outcomes, and benefits.

# Knowledge-Driven DSS

Employs rules, AI, and expert knowledge to suggest decisions.

Example: Clinical Decision Support Systems (CDSS), diagnostic AI systems.

# Knowledge-Driven DSS - Example & Explanation

- Detailed example and scenario of Knowledge-Driven DSS usage.
- Steps, outcomes, and benefits.

# Communication-Driven DSS

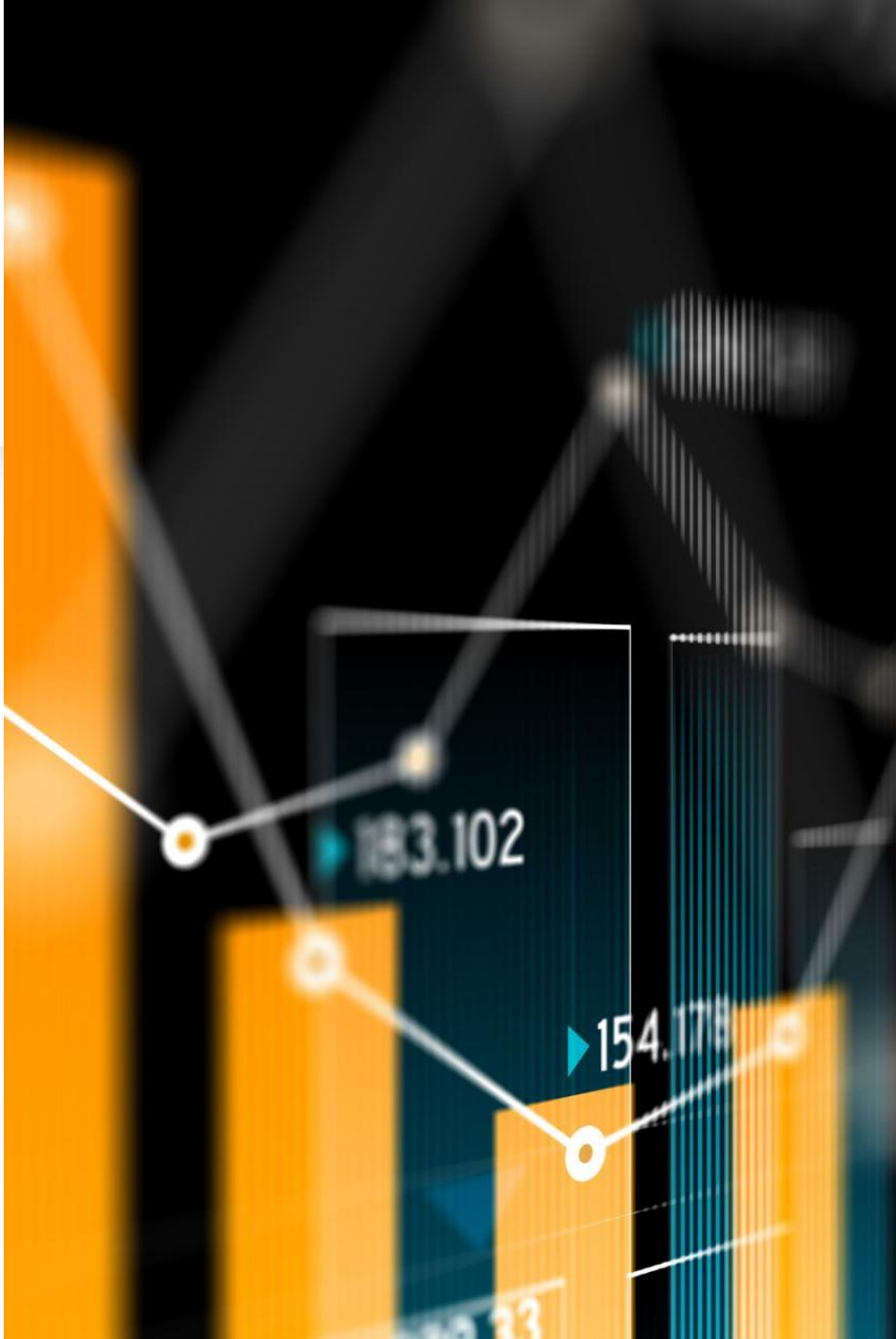
- Supports group collaboration and communication to facilitate decision-making.
- Example: GDSS, collaborative project management tools.

# Communication-Driven DSS - Example & Explanation

- Detailed example and scenario of Communication-Driven DSS usage.
- Steps, outcomes, and benefits.

# DSS Example (1)

- Business: Retail sales dashboards, inventory optimization, marketing campaign analysis.



# DSS Example (2)

Business: Financial risk assessment using model-driven DSS (forecasting, scenario analysis).

# DSS Example (3)

- Healthcare: Clinical Decision Support Systems (CDSS) for diagnosis and treatment recommendations.

# DSS Example (4)

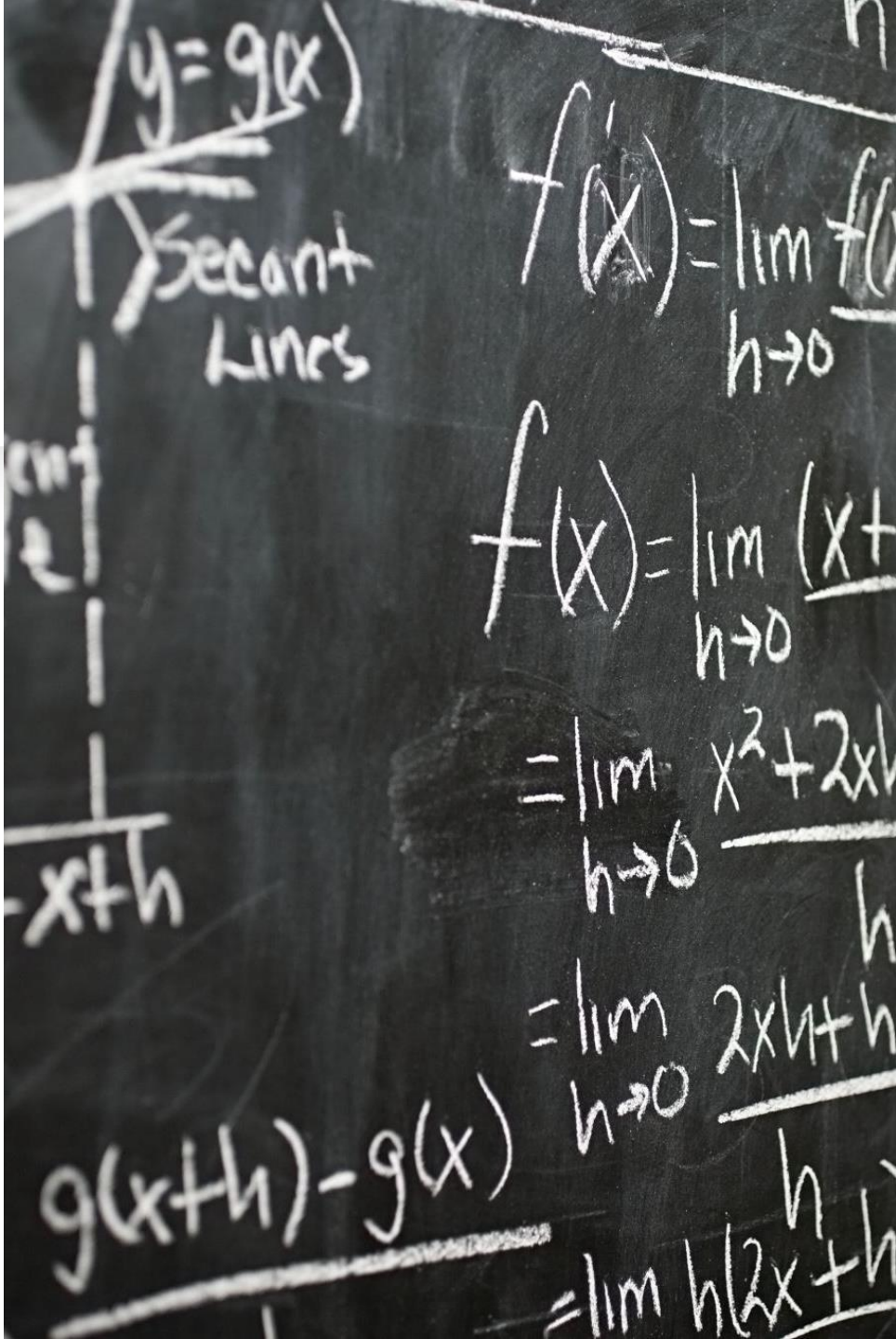
Healthcare: IBM Watson oncology – AI-assisted treatment suggestions.

# DSS Example (5)

Healthcare: Patient monitoring alert systems for early detection of critical conditions.

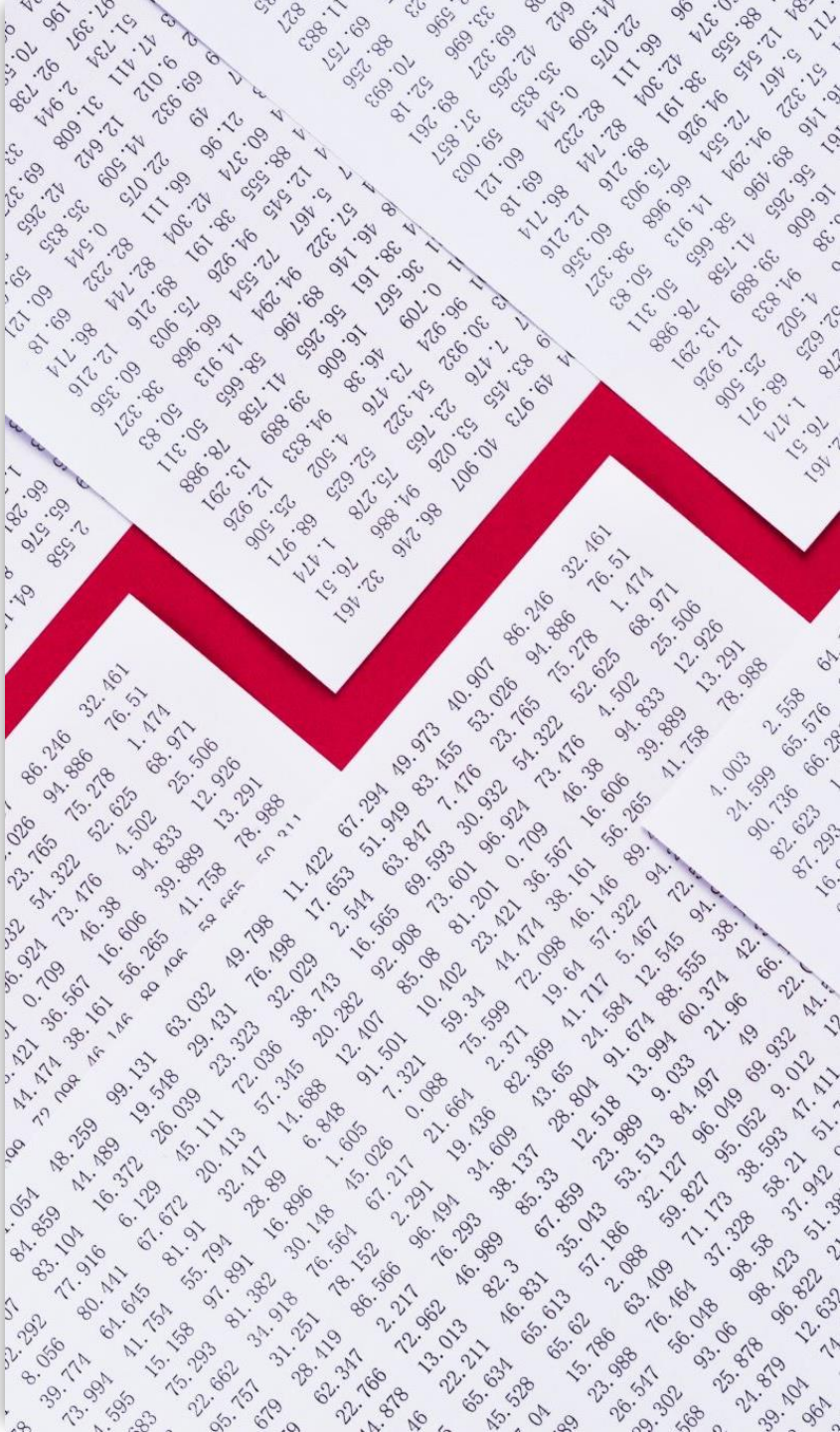
# DSS Example (6)

- Summary: DSS improves efficiency, accuracy, and quality of decisions across sectors.



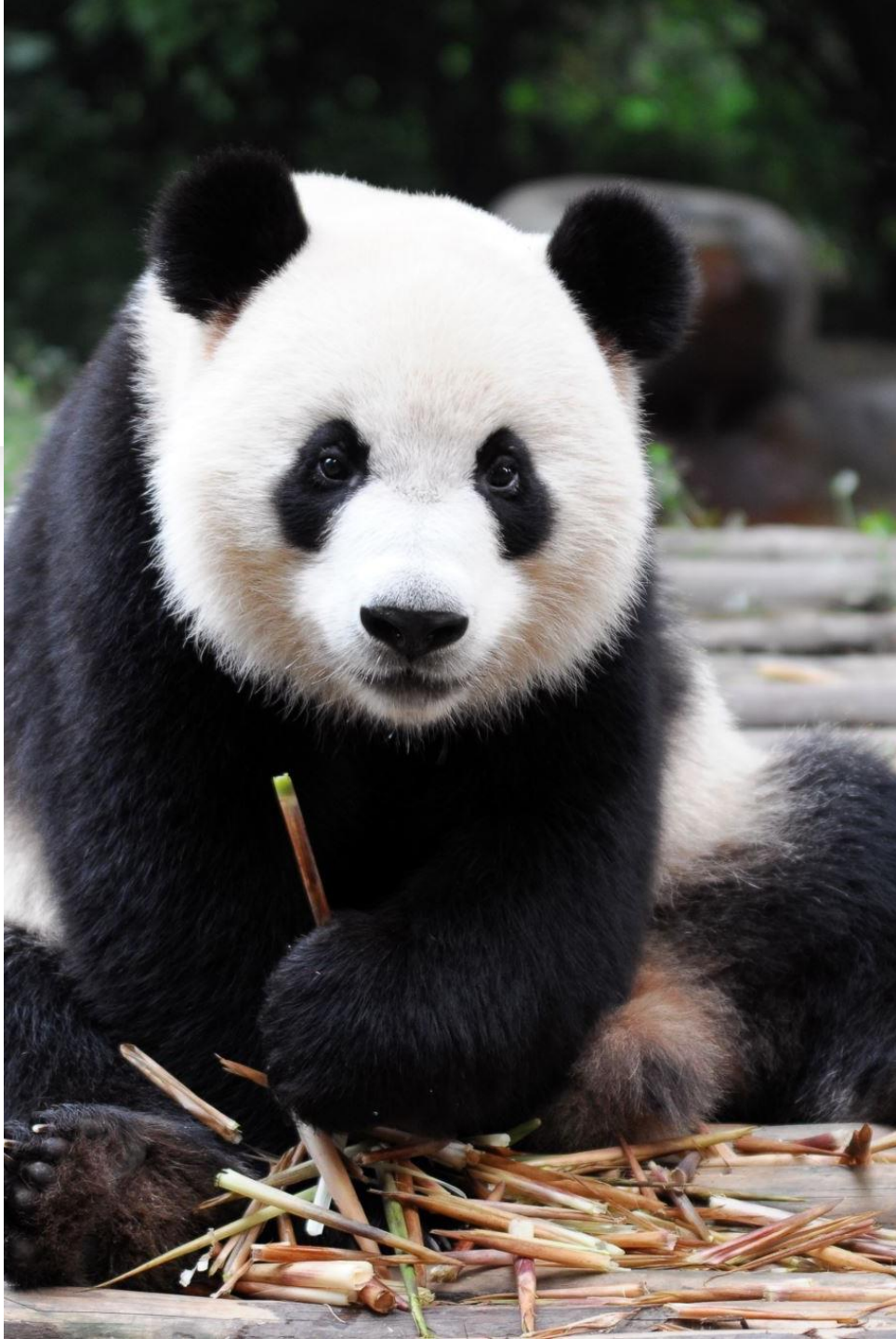
# Practical Exercise (1)

- Exercise 1 – Business: Load 'business_sales.csv' into Python (Pandas) and generate summary reports.



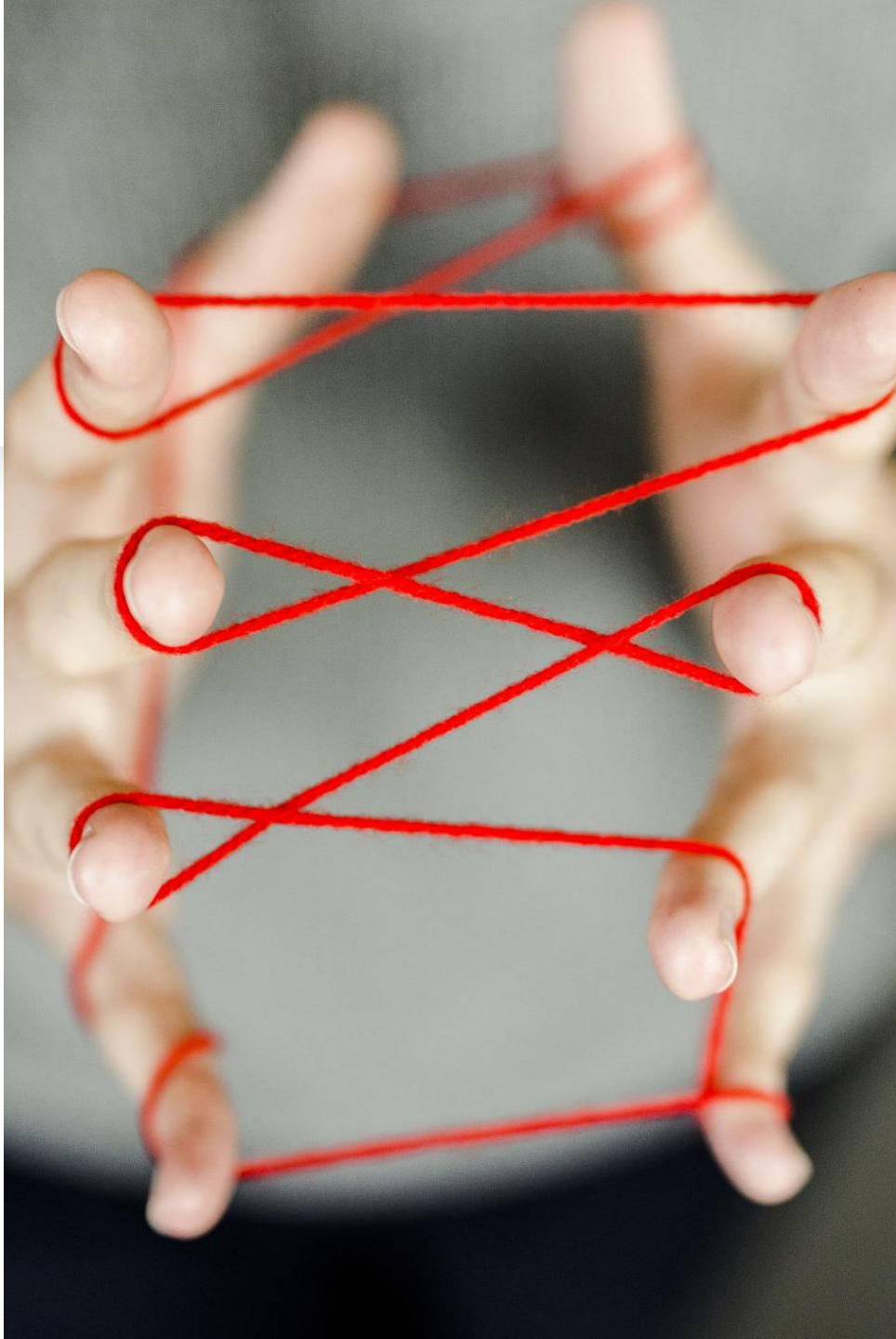
# Practical Exercise (2)

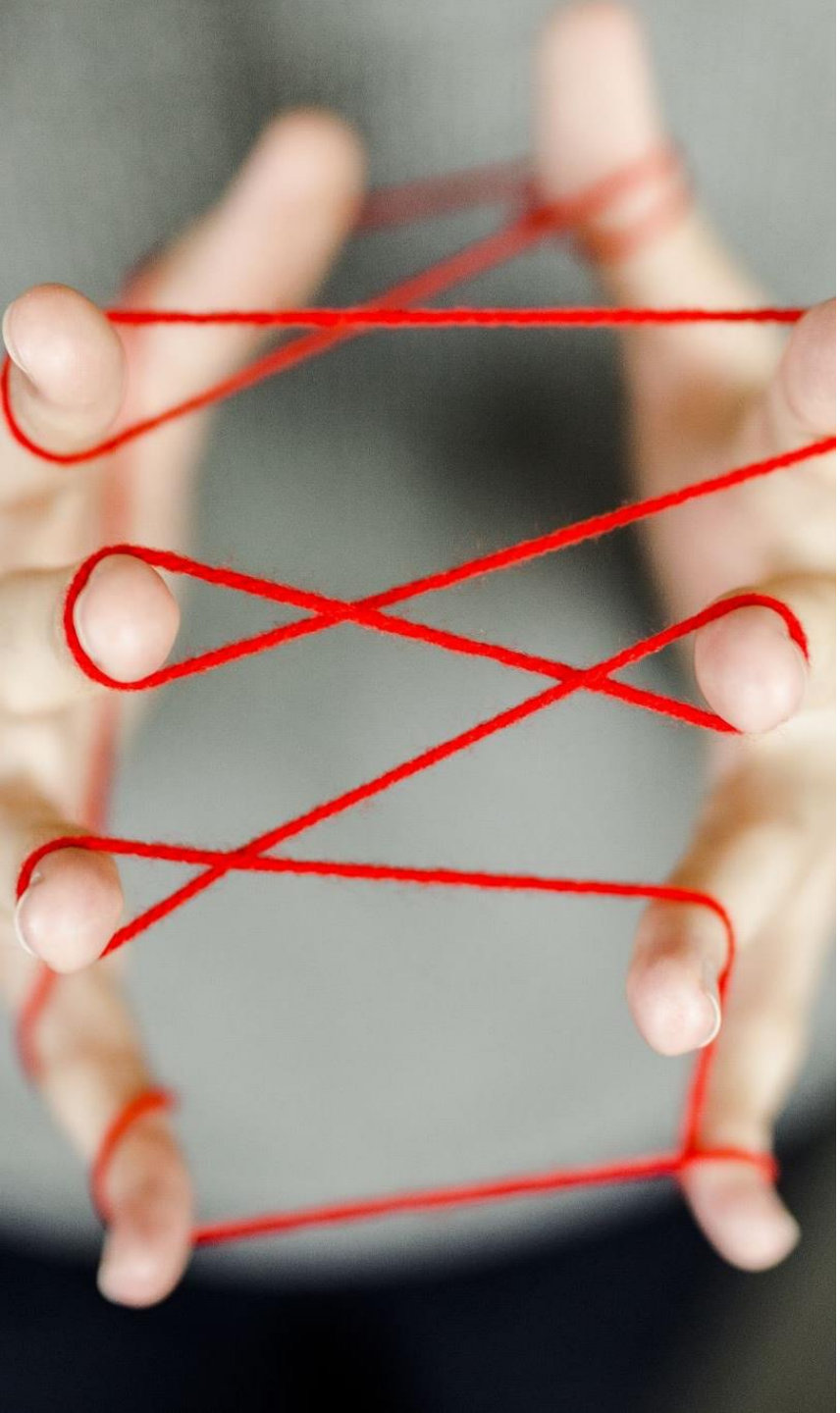
- Exercise 1 – Step 1: Import pandas and read CSV file.



# Practical Exercise (3)

- Exercise 1 – Step 2: Generate descriptive statistics and pivot tables.





# Practical Exercise (4)

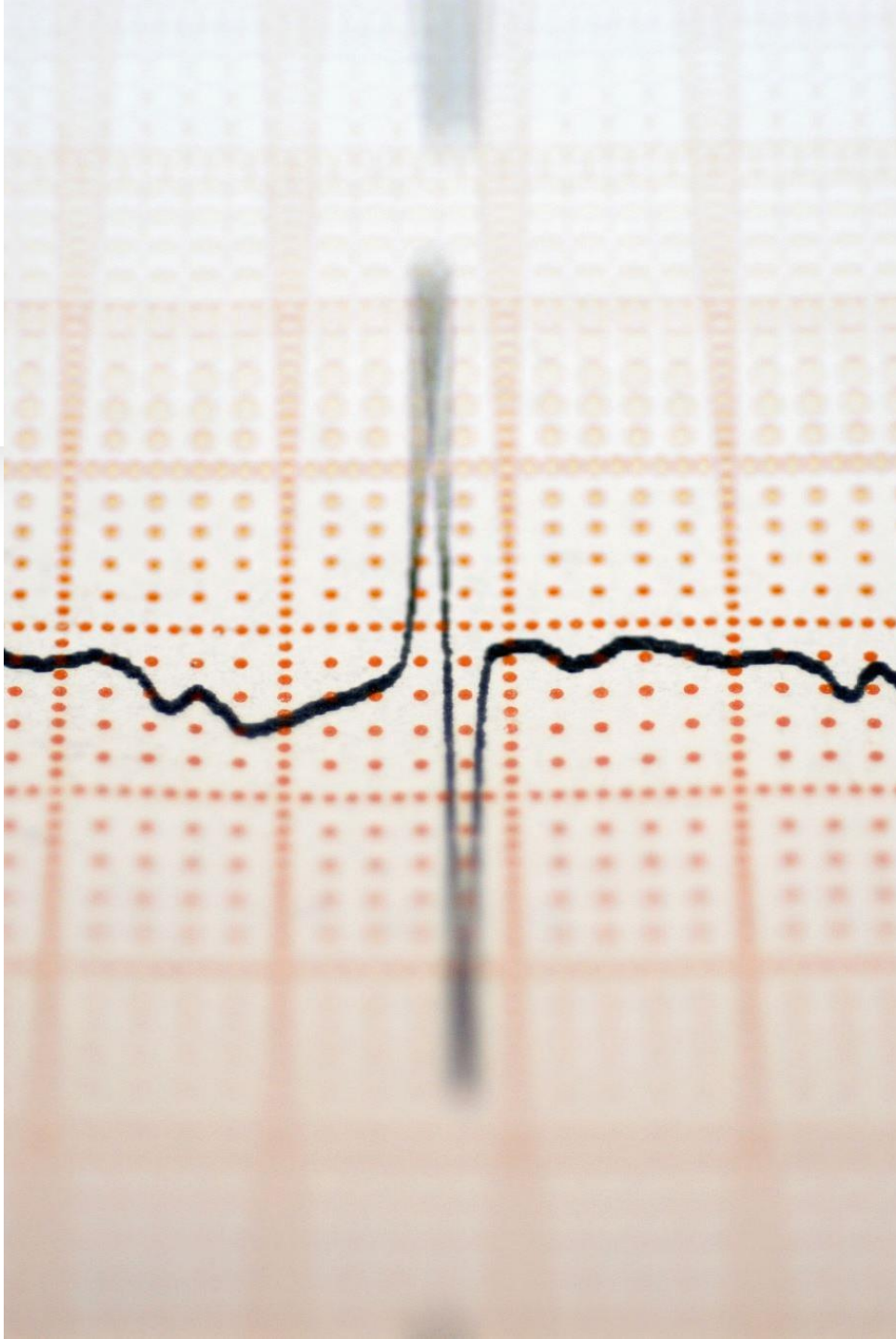
- Exercise 1 – Step 3: Create simple charts to visualize sales trends.

# Practical Exercise (5)

Exercise 1 – Extension:
Add filtering by month or product category.

# Practical Exercise (6)

- Exercise 2 – Healthcare: Load 'healthcare_patients.csv' and create rule-based diagnosis.



# Practical Exercise (7)

- Exercise 2 – Step 1: Read CSV using pandas.

# Practical Exercise (8)

Exercise 2 – Step 2: Define IF-THEN rules for symptoms to diagnosis mapping.

# Practical Exercise (9)

Exercise 2 – Step 3: Apply rules and create a new column 'SuggestedDiagnosis'.

# Practical Exercise (10)

Exercise 2 – Step 4: Analyze results and discuss potential improvements.

# Practical Exercise (11)

Exercise 2 – Extension: Add severity scoring or probability-based suggestions.

# Practical Exercise (12)

- Exercise Summary: Compare business and healthcare DSS applications and outcomes.

# Week 1 Summary

DSS defined and its scope explained

Historical evolution covered

DSS types and real-world examples examined

# Next Week Preview

Decision-Making Foundations & Simon’s Model