

# PseudoCode & Worked Example

Software Engineering 1

Dr Swen E. Gaudl

University of Plymouth 2022

# Mobile.Plymouth.ac.uk

Please Sign in using Code: 

# COMP1000 Agenda This Week:



## **Structure your thinking:**

FlowCharts & Mindmaps -> PseudoCode



## **Intro to computational thinking**

Create a program



## **Starting Your First Dotnet Example Project**

# Computational Thinking/ Algorithmic Thinking

What is an Algorithm?

- Finite process (has ending condition)
- Set of instructions (step-by-step)
- Should solve a specific instance of a problem

# Computational Thinking/ Algorithmic Thinking

- **Is not** about being able to follow an algorithm
- **Is** about translating a real-world problem into a computational problem
- Constructing a **good** computational solution
- If no good solution exists:
  - You need to be able to spec. why
  - Potentially come up with an approx. solution
- Involves abstracting the problem

# Computational Thinking/ Algorithmic Thinking

Abstraction:

- Looking at different levels/layers of the problem
- **extracting** smaller **essential** pieces
- **Ignore** pieces of problem that are not crucial
- Solving the pieces
- Integrate them and repeat

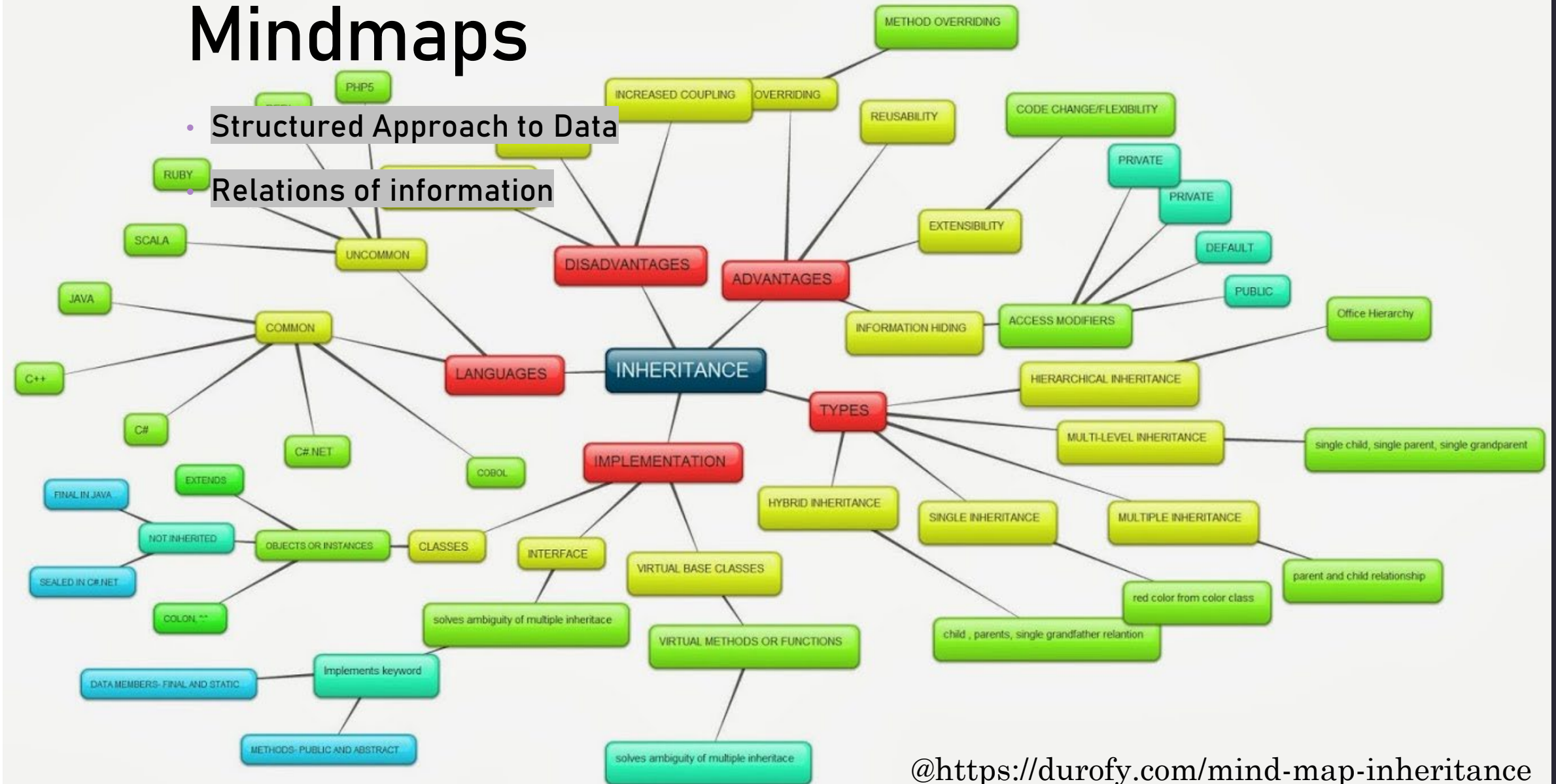
» Creates model of the actual problem

# Tools for looking at problems

# Mindmaps

- Structured Approach to Data







- Relations of information



@<https://durofy.com/mind-map-inheritance>



# Flow Chart Diagrams

Name	Symbol	Usage
Start or Stop		The beginning and end points in the sequence.
Process		An instruction or a command.
Decision		A decision, either yes or no.
Input or Output		An input is data received by a computer. An output is a signal or data sent from a computer.
Connector		A jump from one point in the sequence to another.
Direction of flow		Connects the symbols. The arrow shows the direction of flow of instructions.

# Flow Chart Diagrams

- Making a coffee!
- Making a coffee! (lower abstraction level)

Start/Stop

Process

Decision

Input/Output



# FlowChart

- Small set of symbols
- Take a given process
- Cut it into small pieces
- See where you have choices or want interactions
- Do elements repeat?
- Start simple
- Iterate

Start/Stop

Process

Decision

Input/Output



# FlowChart

- Not just used for programming
- Helpful tool to structure all kinds of processes

Start/Stop

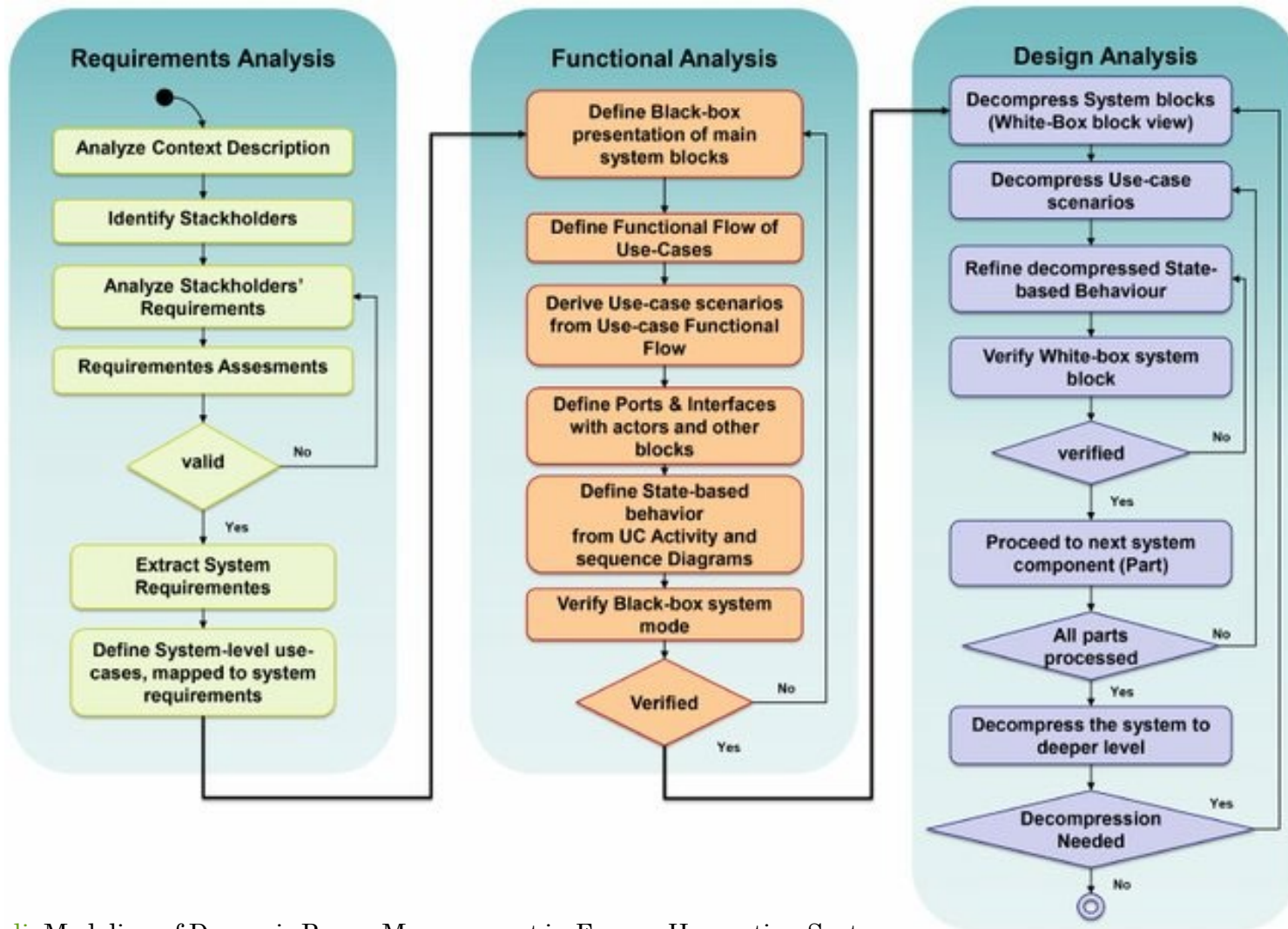
Process

Decision

Input/Output



# FlowChart



Start/Stop

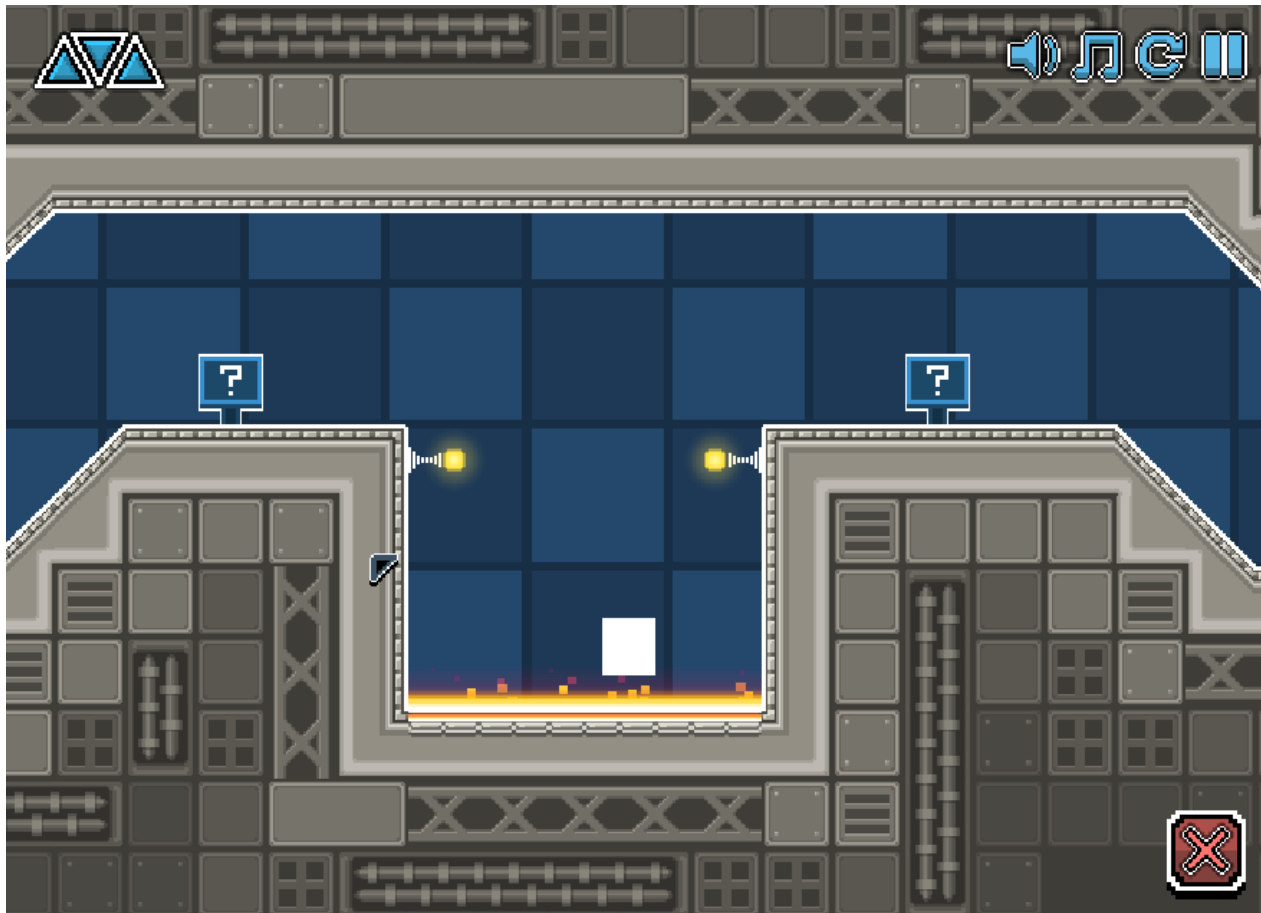
Process

Decision

Input/Output

# Exercise

- Play for 10 min: <https://arcadespot.com/game/geometrica/>



Start/Stop

Process

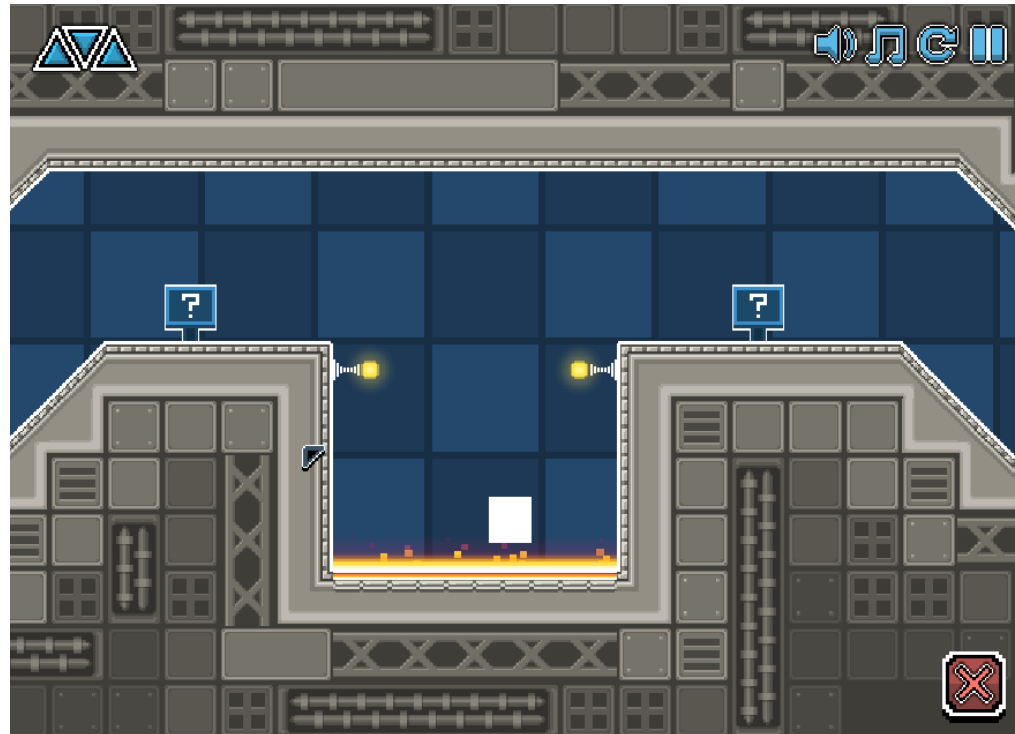
Decision

Input/Output



# Flow ChartExercise

- Based on what you played so far:
  - Design A Program Flow Diagram on How to Play the game



Start/Stop

Process

Decision

Input/Output



# PseudoCode

- Expressing processes
- without visual representation
- Elements:
  - Input
  - Output
  - While
  - For
  - Repeat-until
  - If-then-else
  - Specific instructions
- ordered top to bottom



Start/Stop

Process

Decision

Input/Output





# PseudoCode

- Take the flowchart from Geometrica
- Translate the process for jumping into pseudocode
- Discuss in your teams the outcome

## Some Exercises:

- Identify a process and create a flowchart for it
- Take the flowchart and create a pseudocode program for it
- Exchange the pseudocode with a class mate and test if you can create a valid flowchart from it -> check if your class mate thinks it is correct