University of Sheffield

Part 2: Restructuring - Intro

Software Reengineering

(COM3523 / COM6523)

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The University of Sheffield

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#1146 901

What is Software Reengineering?

Two pillars of software reengineering

Part 1

Understanding

Legacy Software

Part 2

Restructuring

Legacy Software

What you have learned so far …

Part 1

Understanding

Legacy Software

Static analysis

Dynamic analysis

Repository analysis

…

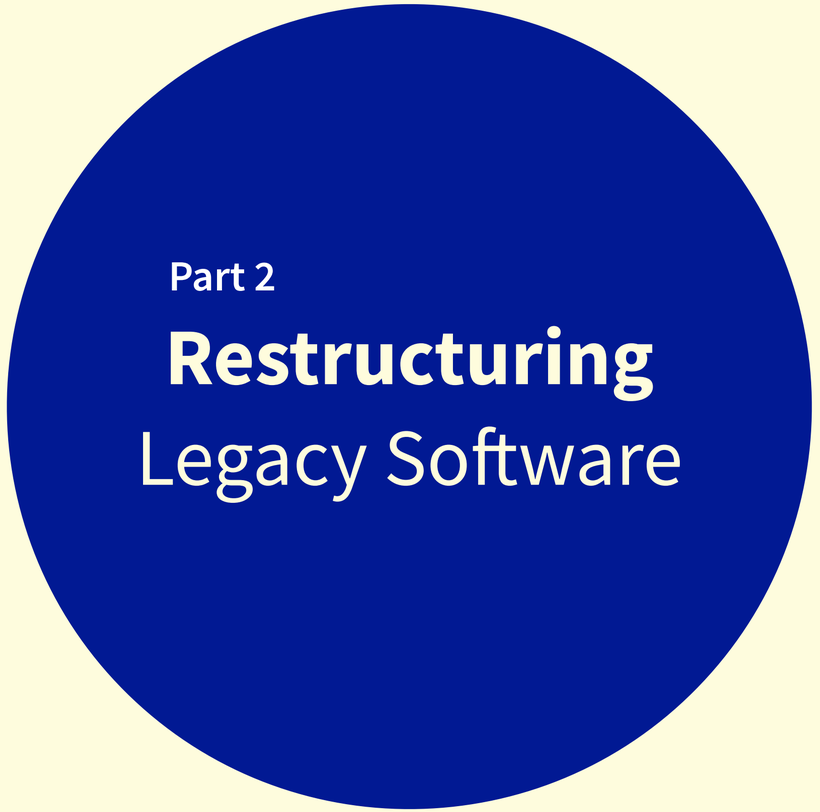
What you will learn from now on …

Testing

Responsibilities

Code clones

Dead code



The four main topics in restructuring legacy software

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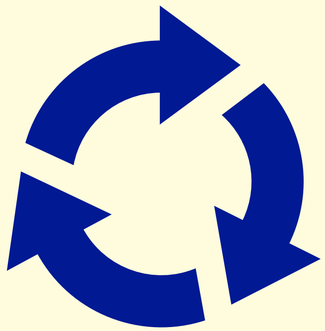
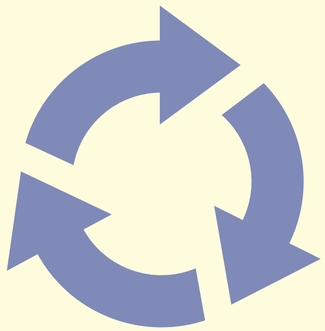


Testing for Reengineering

The four main topics in restructuring legacy software



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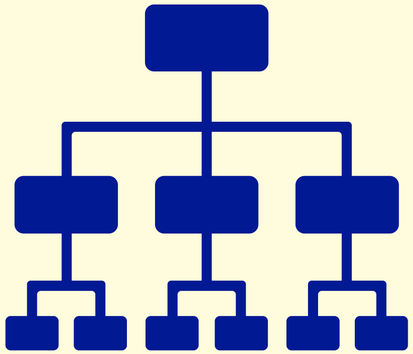
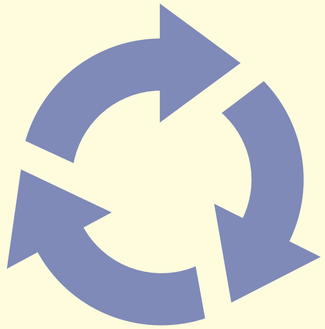


Redistribute Responsibilities

The four main topics in restructuring legacy software



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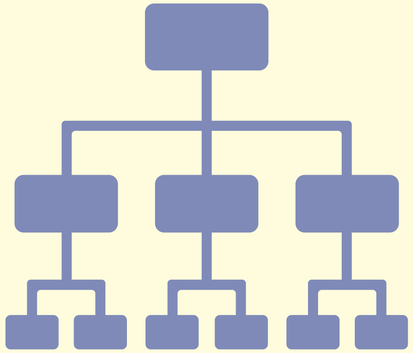
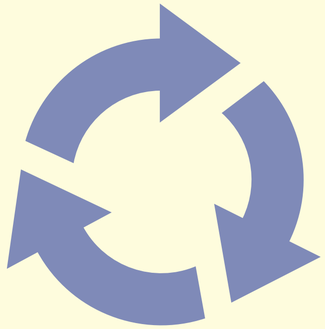


Redistribute Responsibilities

Manage Code Clones

The four main topics in restructuring legacy software



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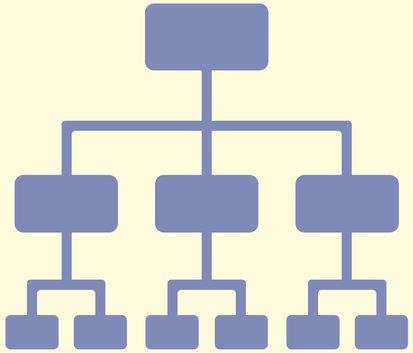

Redistribute Responsibilities

Manage Code Clones

Remove Dead Code

One more thing!

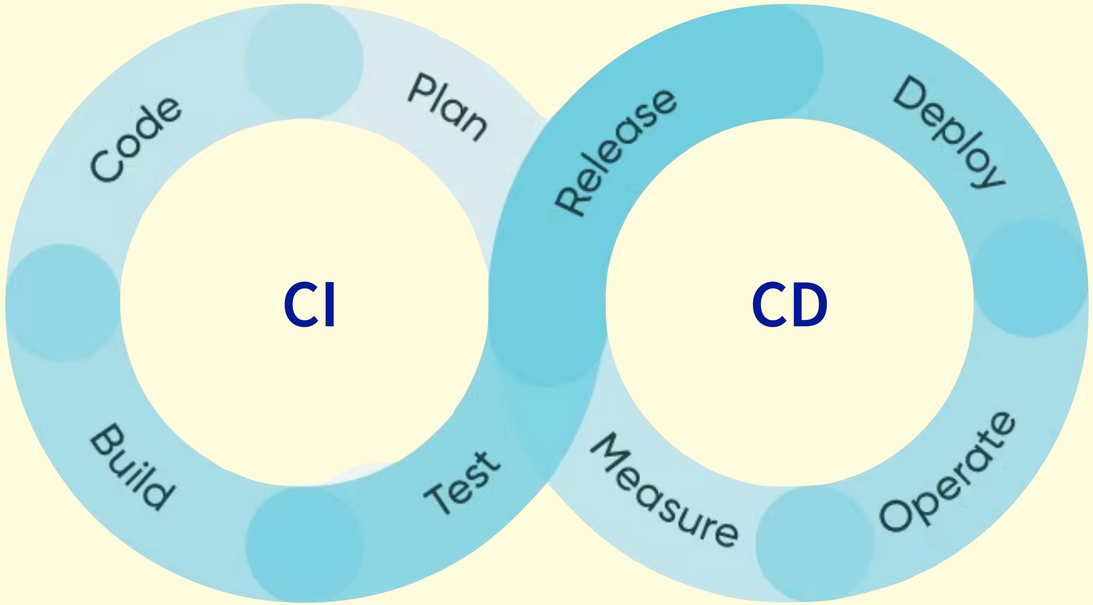

Image from https://www.servicenow.com/uk/products/devops/what-is-cicd.html

Learning objectives for Part 2

To learn frequent ***reengineering problems*** and ***solutions*** as "***patterns***".

To understand the ***objectives*** and ***tradeoffs*** for individual reengineering patterns.

To ***restructure*** legacy software with educated decisions.

What are “patterns”?

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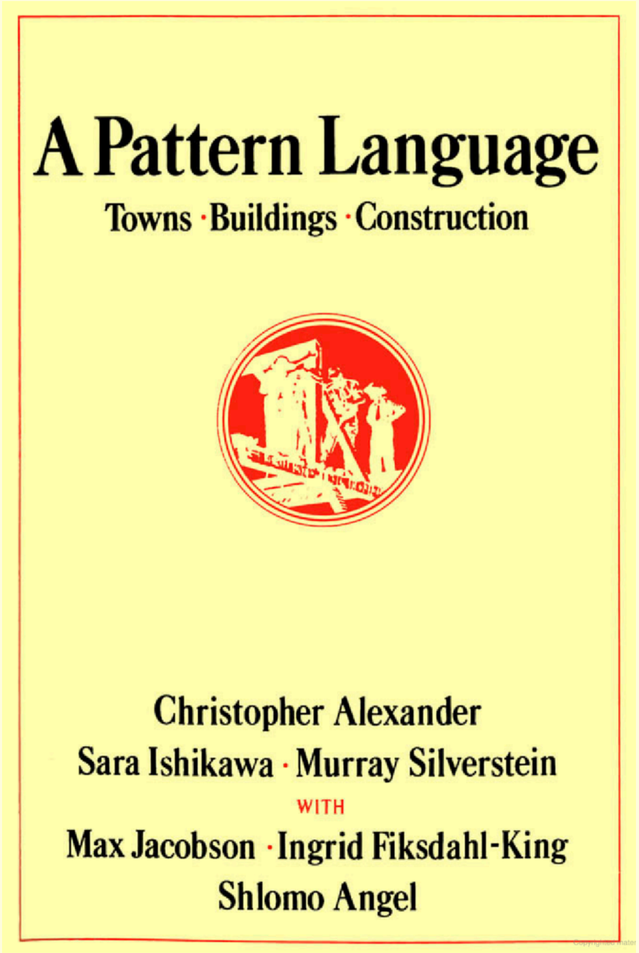
- Architect Christopher Alexander and his colleagues introduced ***patterns*** as a literary form in his book.



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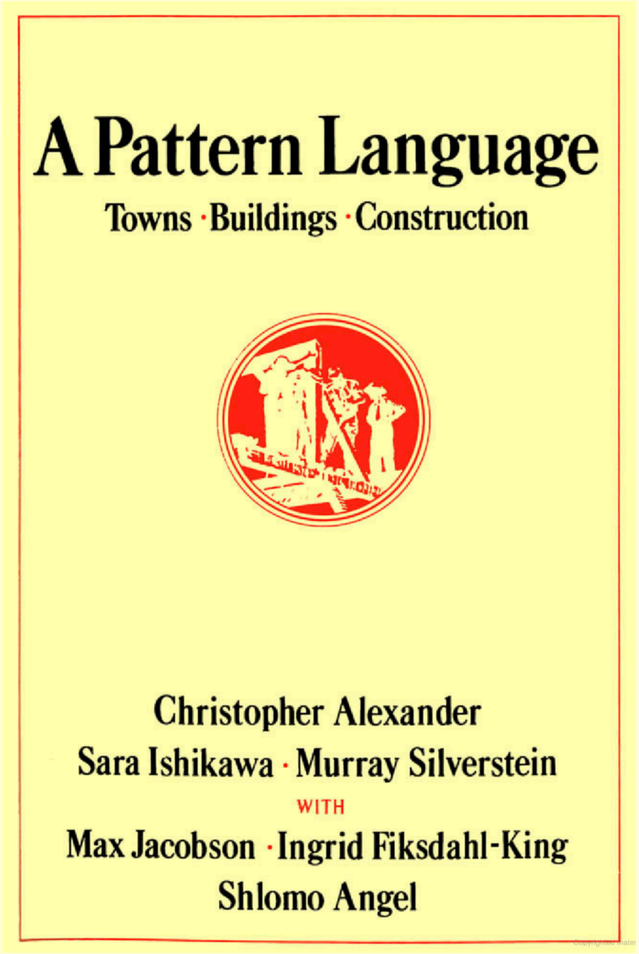

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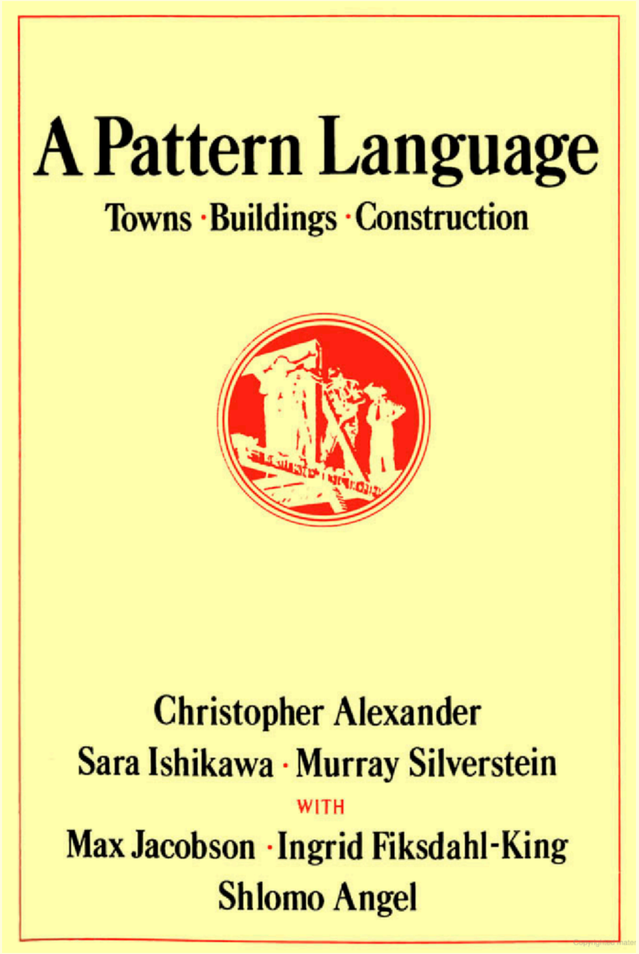
What are “patterns”?

- Architect Christopher Alexander and his colleagues introduced ***patterns*** as a literary form in his book.
- They present a systematic method for architecting various **physical structures**, from rooms to buildings and towns.
- They introduced patterns to discuss ***issues*** and ***tradeoffs***.



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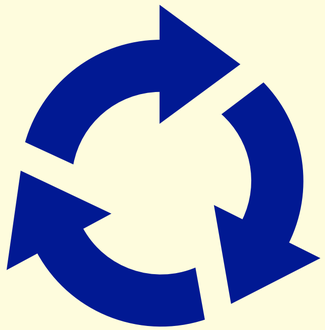
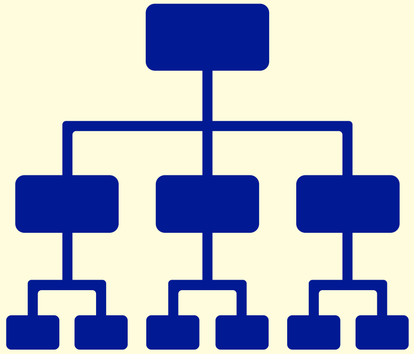
Reengineering patterns

- Let us discuss ***recurring issues*** and ***tradeoffs*** in reengineering legacy systems.
- Help in diagnosing ***problems***, identifying ***weaknesses***, and finding ***solutions***.



Testing for Reengineering



Redistribute Responsibilities

Manage Code Clones

Remove Dead Code

For each reengineering pattern, you will learn …

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1. Problem

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2. Solution

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4. Examples

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2. Solution
3. Related techniques
4. Examples
5. Tradeoffs (pros, cons, difficulties)

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1. Problem
2. Solution
3. Related techniques
4. Examples
5. Tradeoffs (pros, cons, difficulties)
6. Advanced topics

How are reengineering patterns different from refactoring?

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Refactoring is a technique to resolve specific reengineering patterns.

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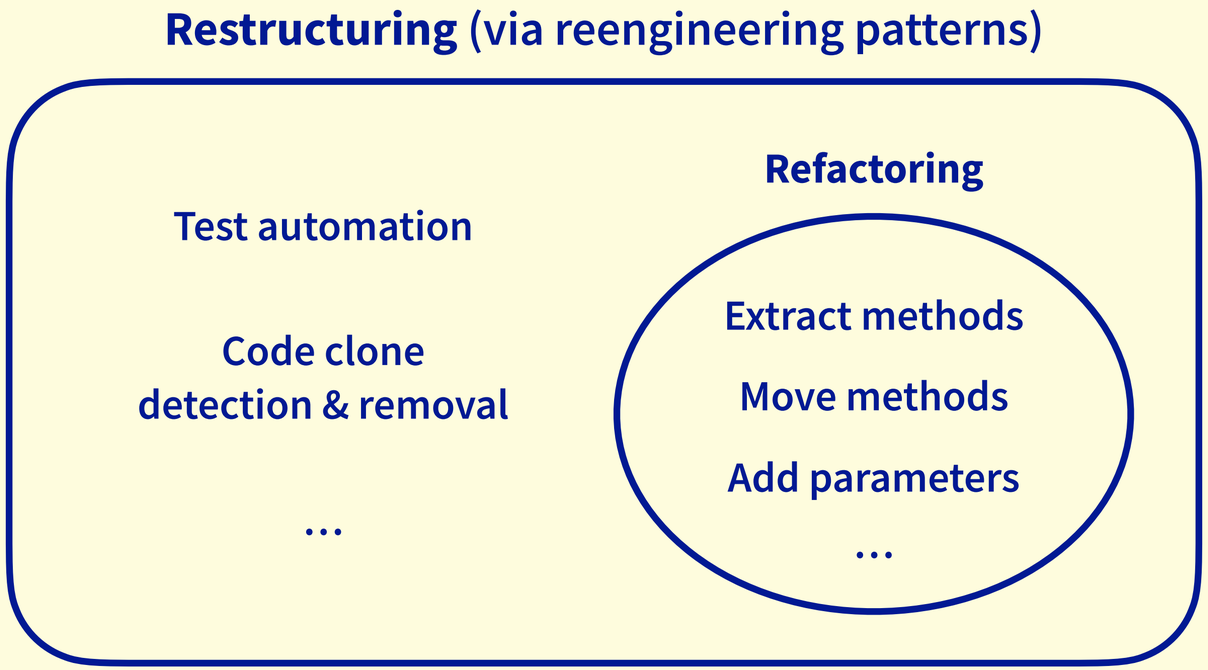
Refactoring is a technique to resolve specific reengineering patterns.

Reengineering patterns entail more than refactoring (e.g., test automation).



Our journey will be …

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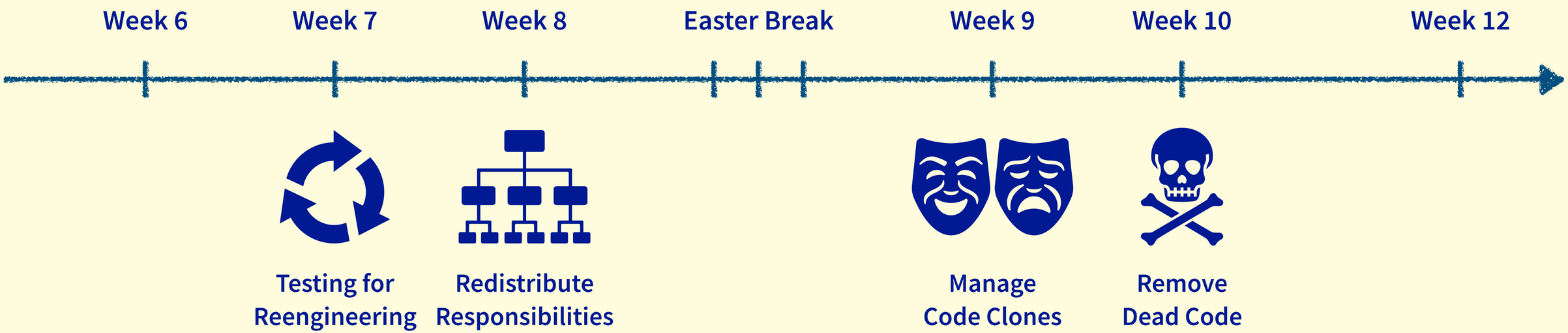

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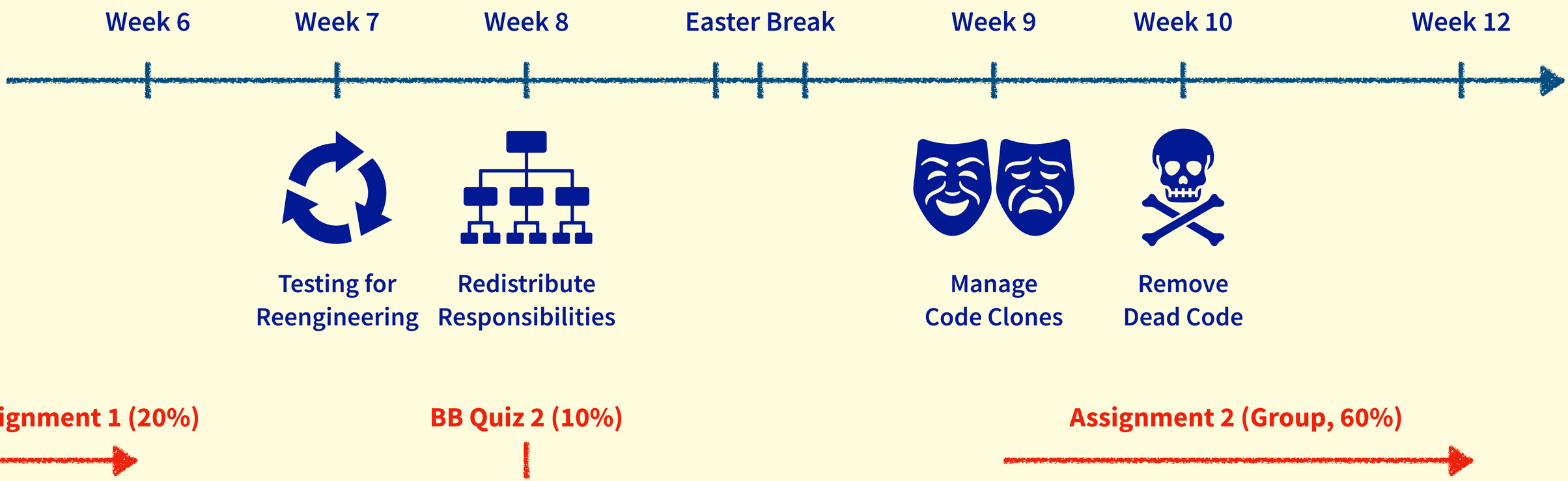

Weekly lab sessions

You will get hands-on experience with the corresponding lecture materials.

Each session will have a live demonstration (by an instructor) followed by lab exercises.

The answers for the lab sessions will be available by the end of the week.

Where can I get support?

Where can I get support?

- Sli.do

Where can I get support?

- Sli.do
- Your group

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- Blackboard discussion forum

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- Office hours (available on Blackboard - Staff Contacts)
  - Please only send us emails directly as a last resort.

Reading material

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- The following book covers the main concepts of the restructuring part:
  - *“Object Oriented Reengineering Patterns”* by Serge Demeyer, Stéphane Ducasse, and Oscar Nierstratz.
  - The book is available as a **free** e-book here: http://scg.unibe.ch/download/oorp/

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- Additionally, each lecture will include relevant papers or chapters from books.
  - Check out the "**Reading List (click here)**" on Blackboard - all the links are there.

Any questions?

You can use the Sli.do Q&A if you prefer!