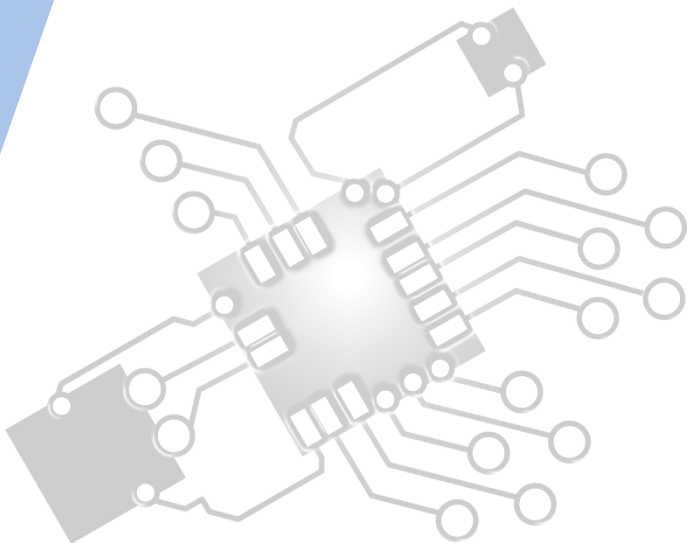




Computational thinking, problem-solving and programming:

General Principals

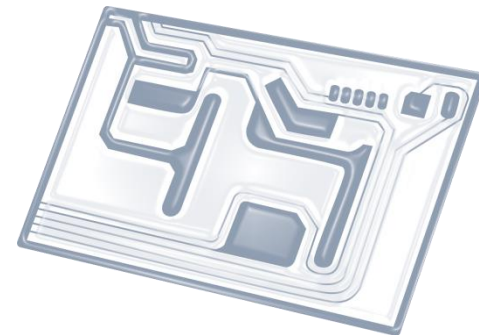
IB Computer Science



*Content developed by
Dartford Grammar School
Computer Science Department*



HL Topics 1-7, D1-4



1: System design



2: Computer Organisation



3: Networks



4: Computational thinking



5: Abstract data structures



6: Resource management



7: Control



D: OOP

HL & SL 4.1 Overview

Thinking procedurally

4.1.1 Identify the procedure appropriate to solving a problem

4.1.2 Evaluate whether the order in which activities are undertaken will result in the required outcome

4.1.3 Explain the role of sub-procedures in solving a problem

Thinking logically

4.1.4 Identify when decision-making is required in a specified situation

4.1.5 Identify the decisions required for the solution to a specified problem

4.1.6 Identify the condition associated with a given decision in a specified problem

4.1.7 Explain the relationship between the decisions and conditions of a system

4.1.8 Deduce logical rules for real-world situations

Thinking ahead

4.1.9 Identify the inputs and outputs required in a solution

4.1.10 Identify pre-planning in a suggested problem and solution

4.1.11 Explain the need for pre-conditions when executing an algorithm

4.1.12 Outline the pre- and post-conditions to a specified problem

4.1.13 Identify exceptions that need to be considered in a specified problem solution

Thinking concurrently

4.1.14 Identify the parts of a solution that could be implemented concurrently

4.1.15 Describe how concurrent processing can be used to solve a problem

4.1.16 Evaluate the decision to use concurrent processing in solving a problem

Thinking abstractly

4.1.17 Identify examples of abstraction

4.1.18 Explain why abstraction is required in the derivation of computational solutions for a specified situation

4.1.19 Construct an abstraction from a specified situation

4.1.20 Distinguish between a real-world entity and its abstraction



1: System design

2: Computer Organisation



3: Networks

4: Computational thinking



5: Abstract data structures

6: Resource management

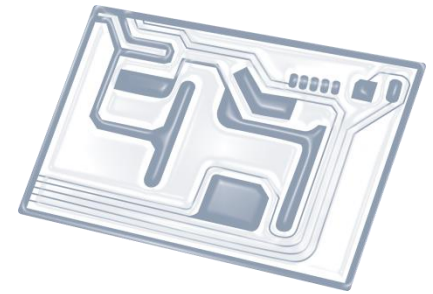


7: Control

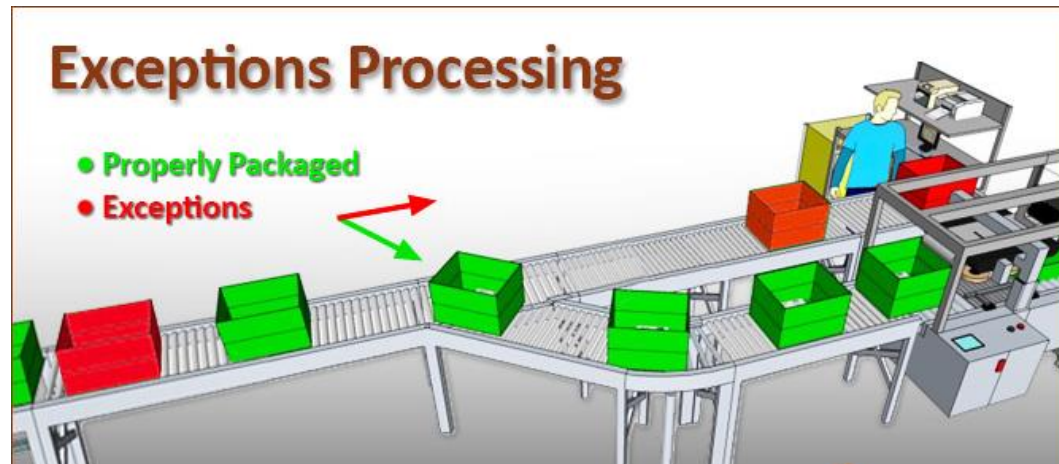
D: OOP



Topic 4.1.13



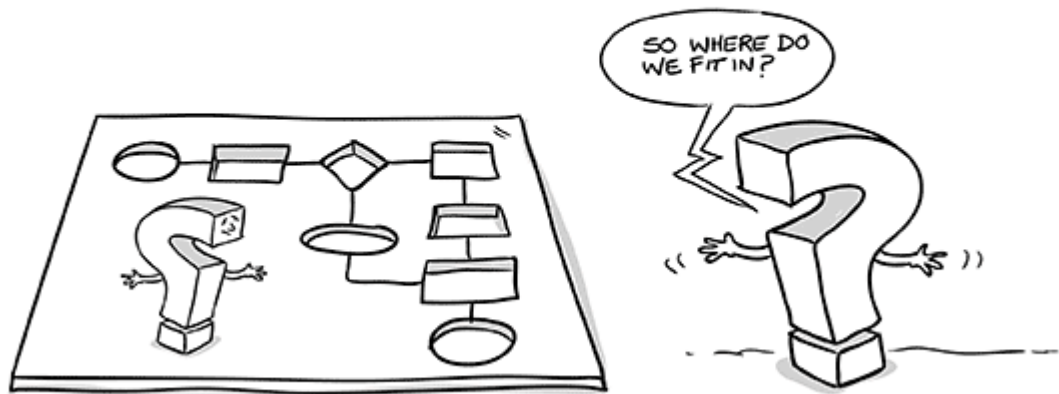
Identify **exceptions** that need to be considered in a specified problem solution



Example:

- Identify the pre-conditions for calculating the end-of-year-bonus when not all employees have worked for the company for the whole year.

Dealing with Exceptions in processes



Basic rule: **think ahead!**

