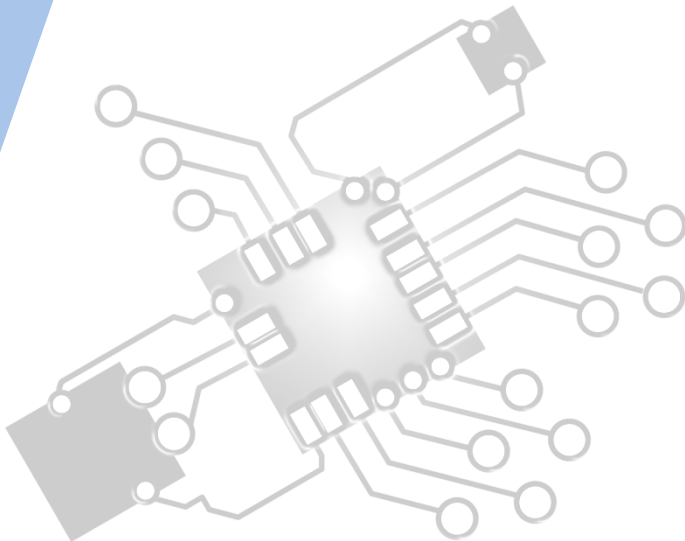




Computer Organisation

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 2 Overview

Computer architecture

2.1.1 Outline the architecture of the central processing unit (CPU) and the functions of the arithmetic logic unit (ALU) and the control unit (CU) and the registers within the CPU

2.1.2 Describe primary memory. 2 Distinguish between random access memory (RAM) and read-only memory (ROM), and their use in primary memory

2.1.3 Explain the use of cache memory

2.1.4 Explain the machine instruction cycle

Secondary memory

2.1.5 Identify the need for persistent storage

Operating systems and application systems

2.1.6 Describe the main functions of an operating system

2.1.7 Outline the use of a range of application software

2.1.8 Identify common features of applications

Binary representation

2.1.9 Define the terms: bit, byte, binary, denary/decimal, hexadecimal

2.1.10 Outline the way in which data is represented in the computer

Simple logic gates

2.1.11 Define the Boolean operators: AND, OR, NOT, NAND, NOR and XOR

2.1.12 Construct truth tables using the above operators

2.1.13 Construct a logic diagram using AND, OR, NOT, NAND, NOR and XOR gates



1: System design

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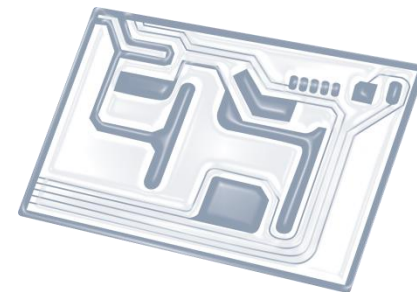


7: Control

D: OOP



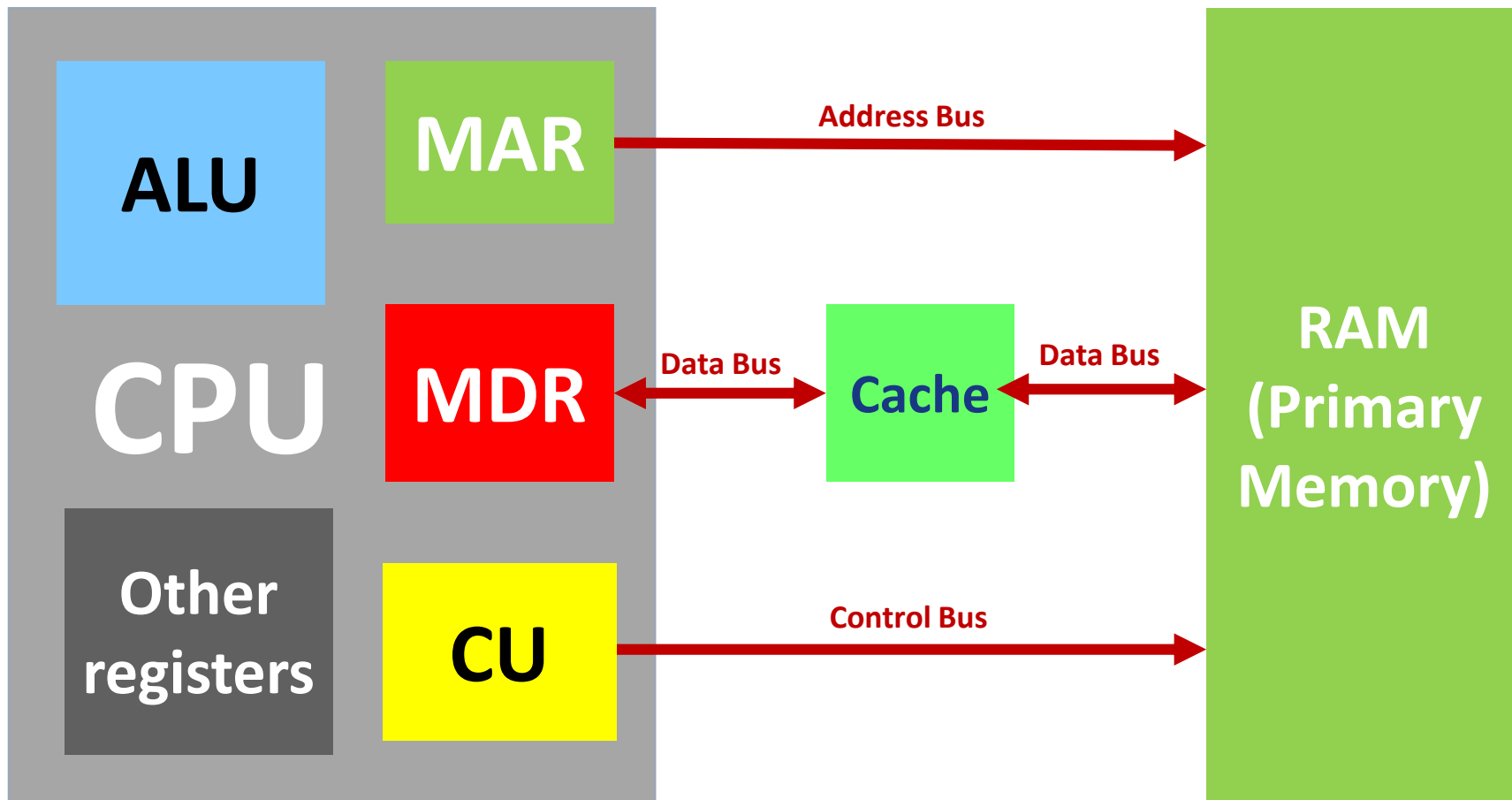
Topic 2.1.3

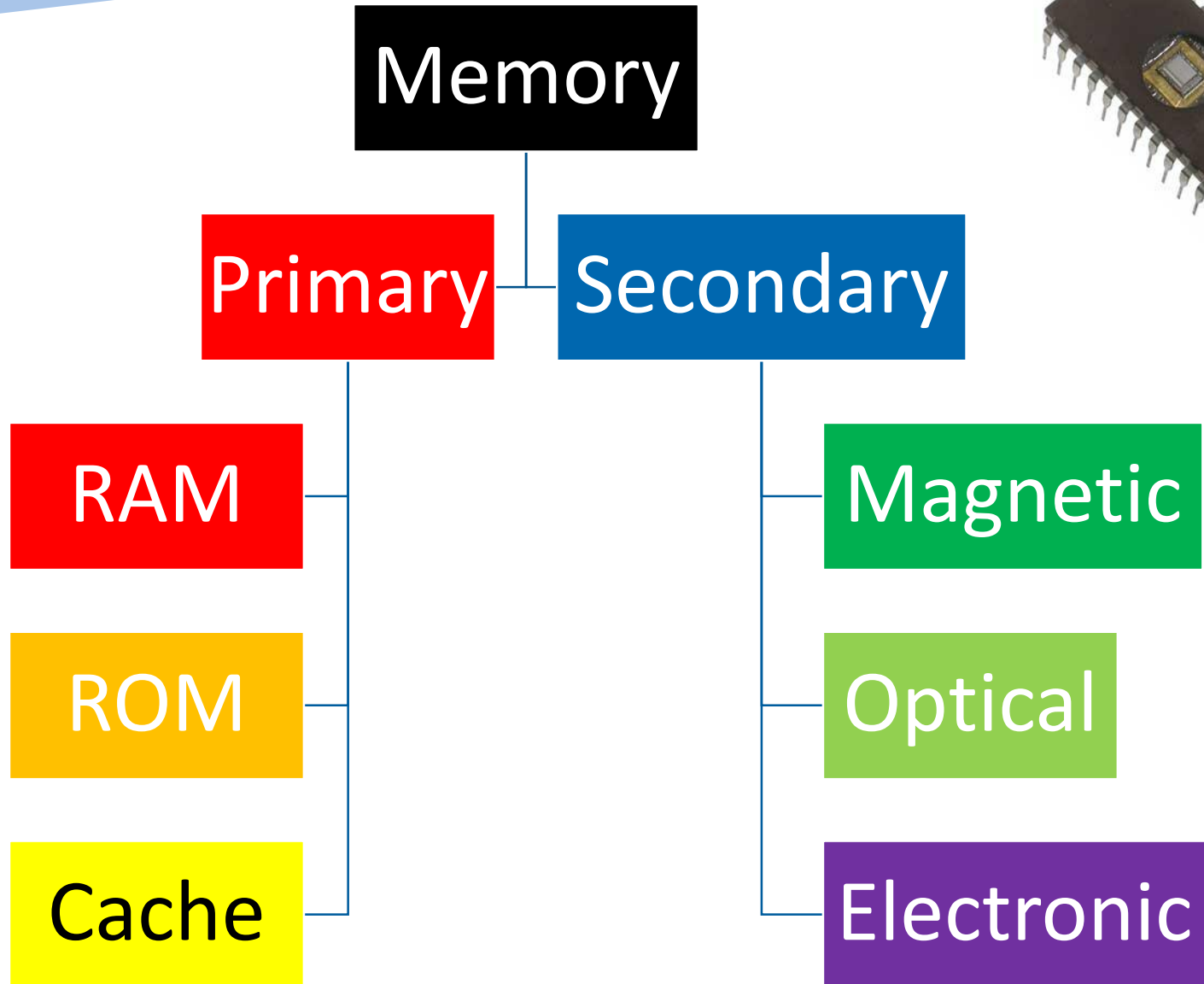


Explain the use of **cache memory**.



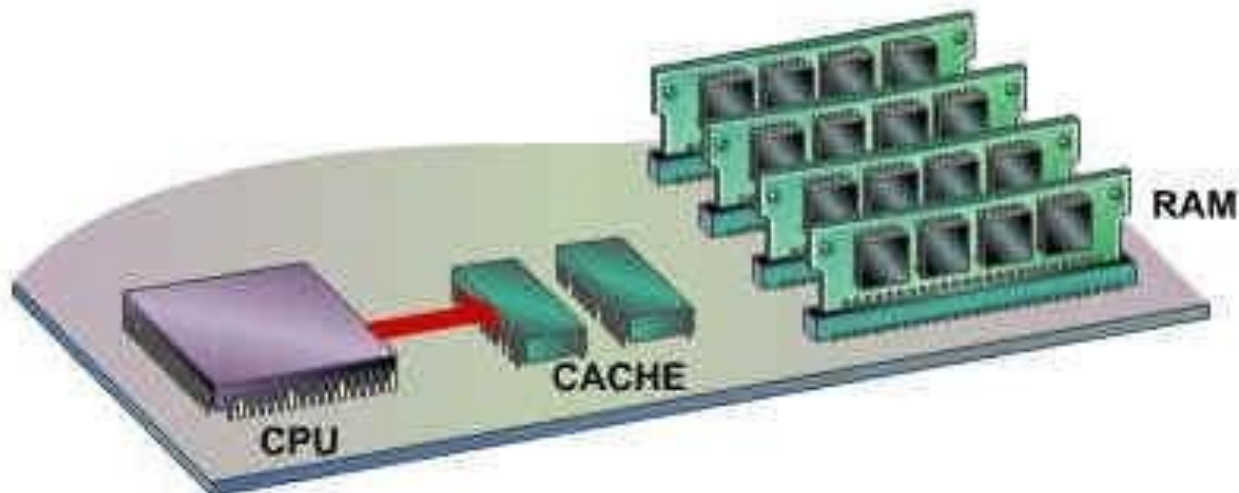
Simplified model: CPU, RAM

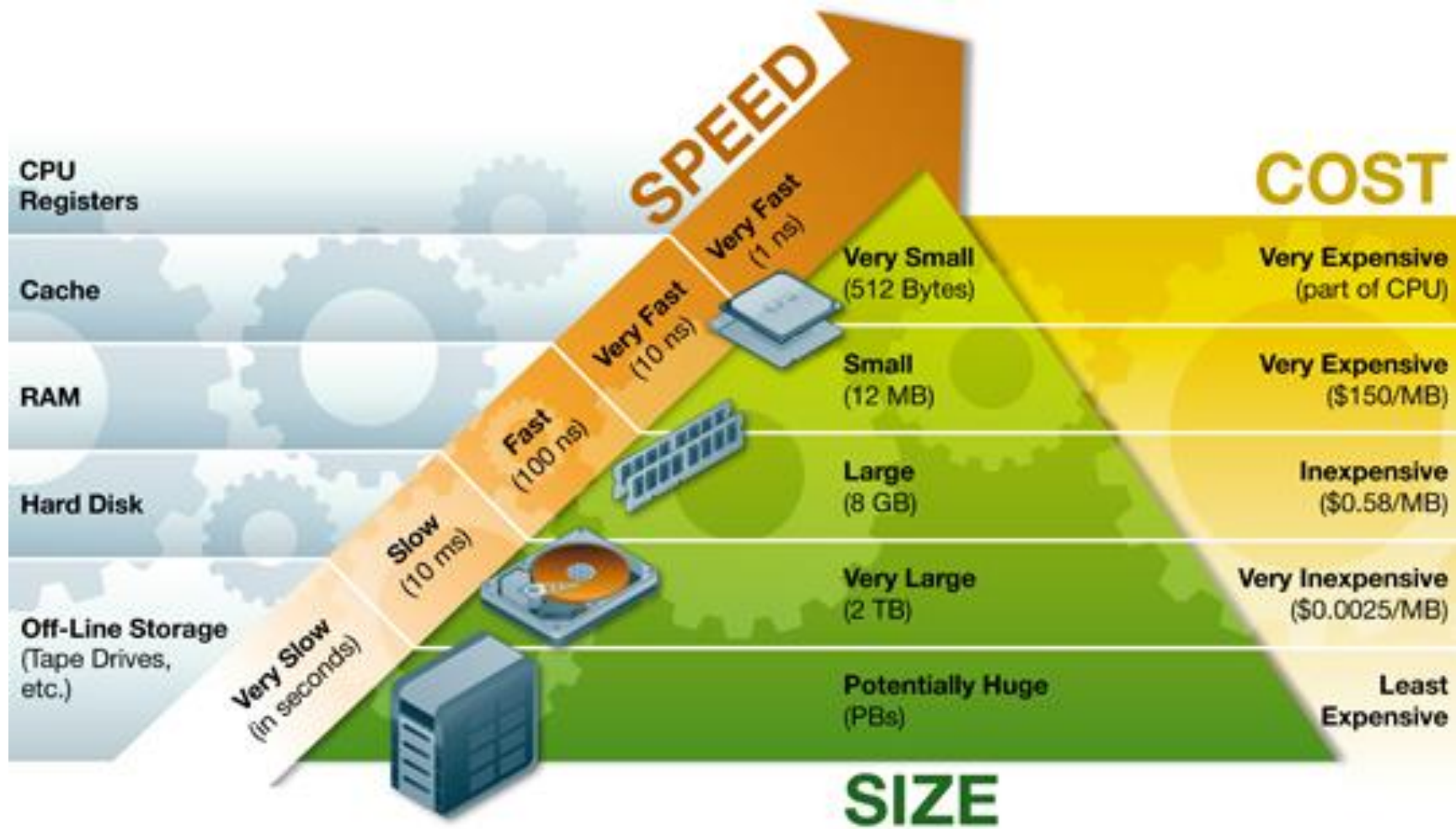




Definition: cache

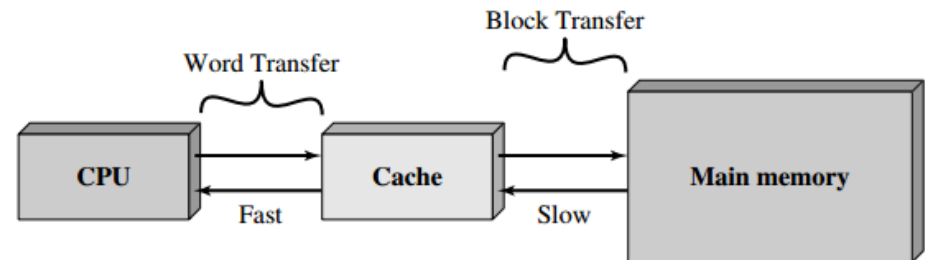
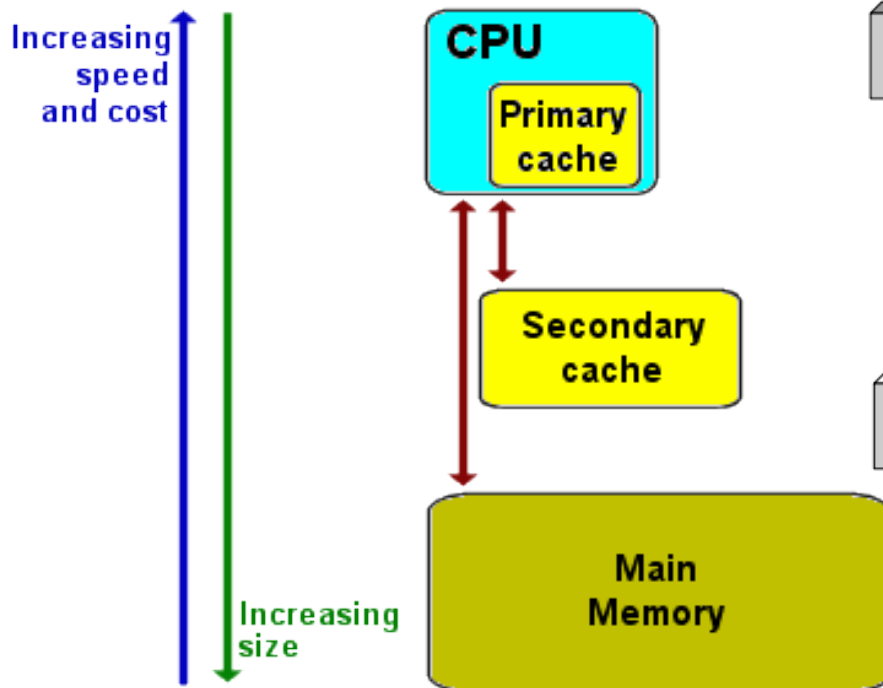
A type of **small, high-speed** memory **inside** the CPU used to hold **frequently used data**, so that the CPU needs to access the much slower RAM less frequently



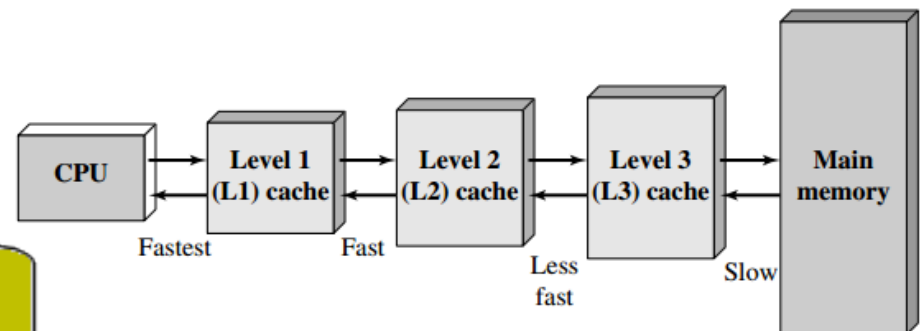


Cache levels*

*Although **not examined**, it is good to know that cache actually exists in **levels/stages** in modern computers



(a) Single cache



(b) Three-level cache organization

Cache **hit** vs Cache **miss**

Video (YouTube) link: <https://youtu.be/Zr8WKIOIKsk>

