



Introduction to Computational Thinking: Course Introduction and Overview

What is Computational Thinking?

Problem Solving Process



- formulates the solution to a problem in the form of algorithms
- solves by using computer
- consists of several parts

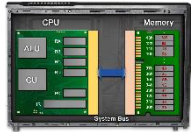
A L G O R I T H M

- a sequence of step-by-step instructions
- tells the computer how to solve a problem
- used extensively in many real-world applications

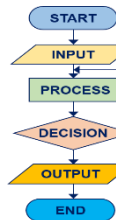
OUTLINE



Overview of
Programming
Language



Computer
Internal
operations



Basic Program
Structure and
Construct



Computational
Thinking
Process



Algorithm
Complexity



Computing
Trends

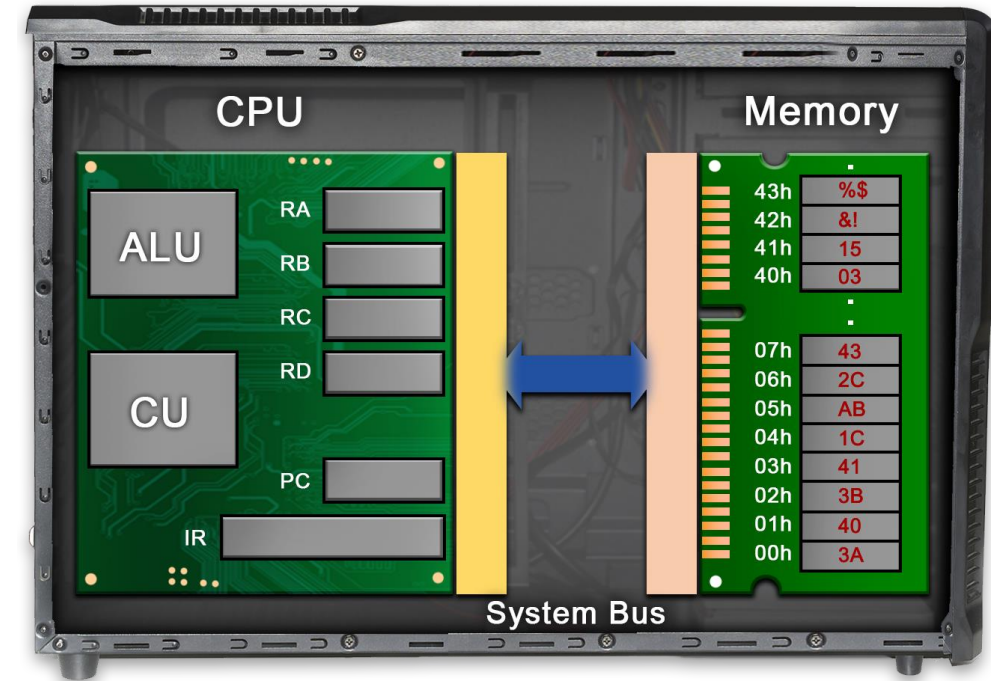
Overview of Programming Language

- Machine language
- High level programming languages
 - C, C++, Python, Java



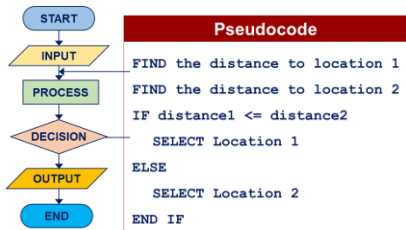
Computer Internal Operations

- Microprocessor
- Calculations performed at very high speed
 - Addition, Subtraction, Multiplication, Boolean operations



Basic Program Structure and Construct

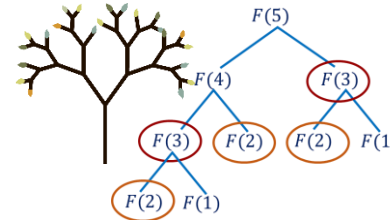
Flowchart and Pseudocode



Data Types and Variables

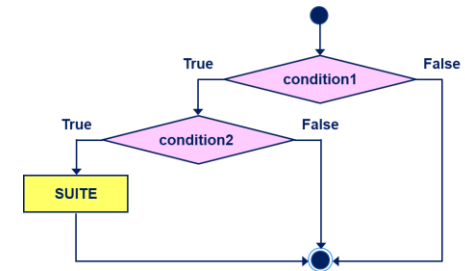


Iteration, Recursion



Selection

Branching

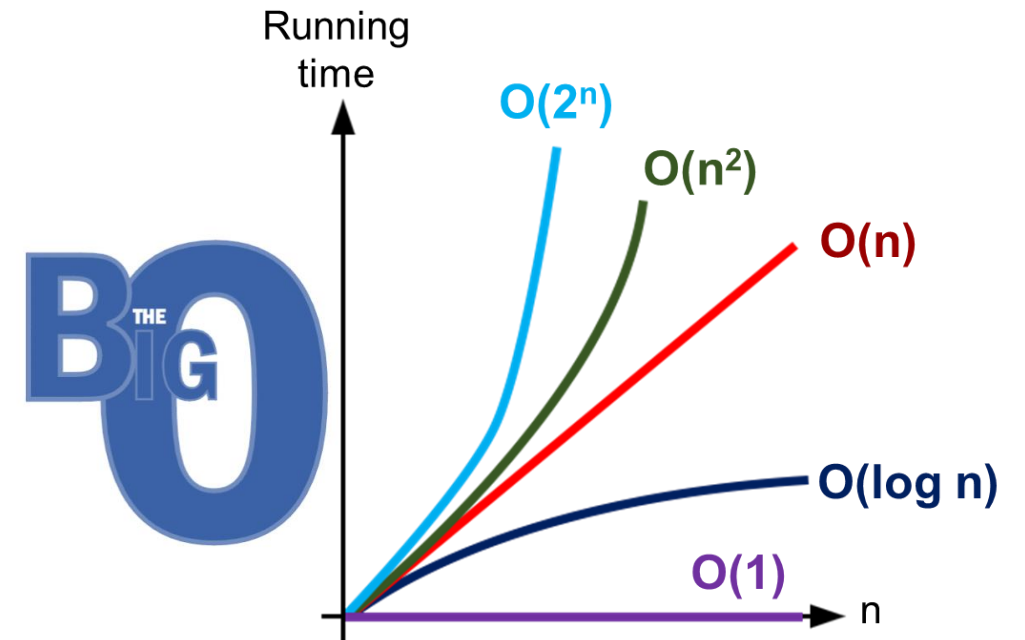


Computational Thinking Process

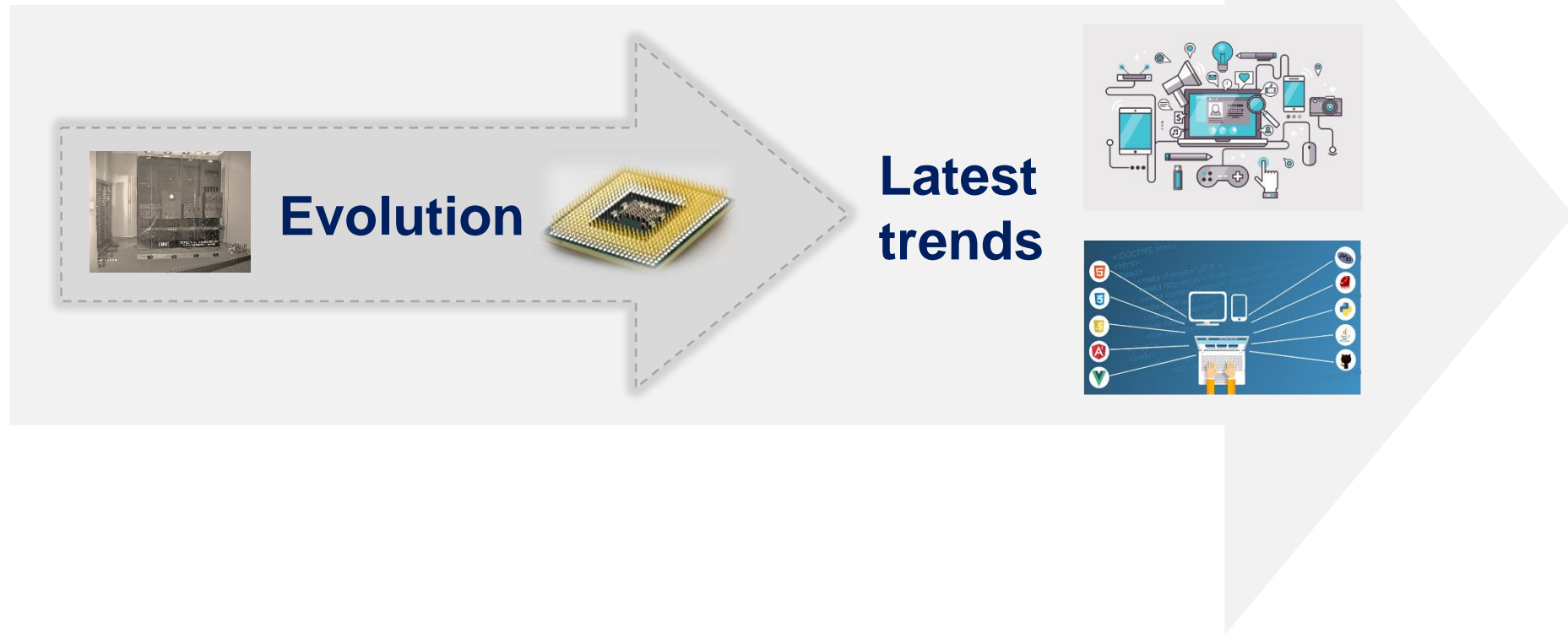


Algorithm Complexity

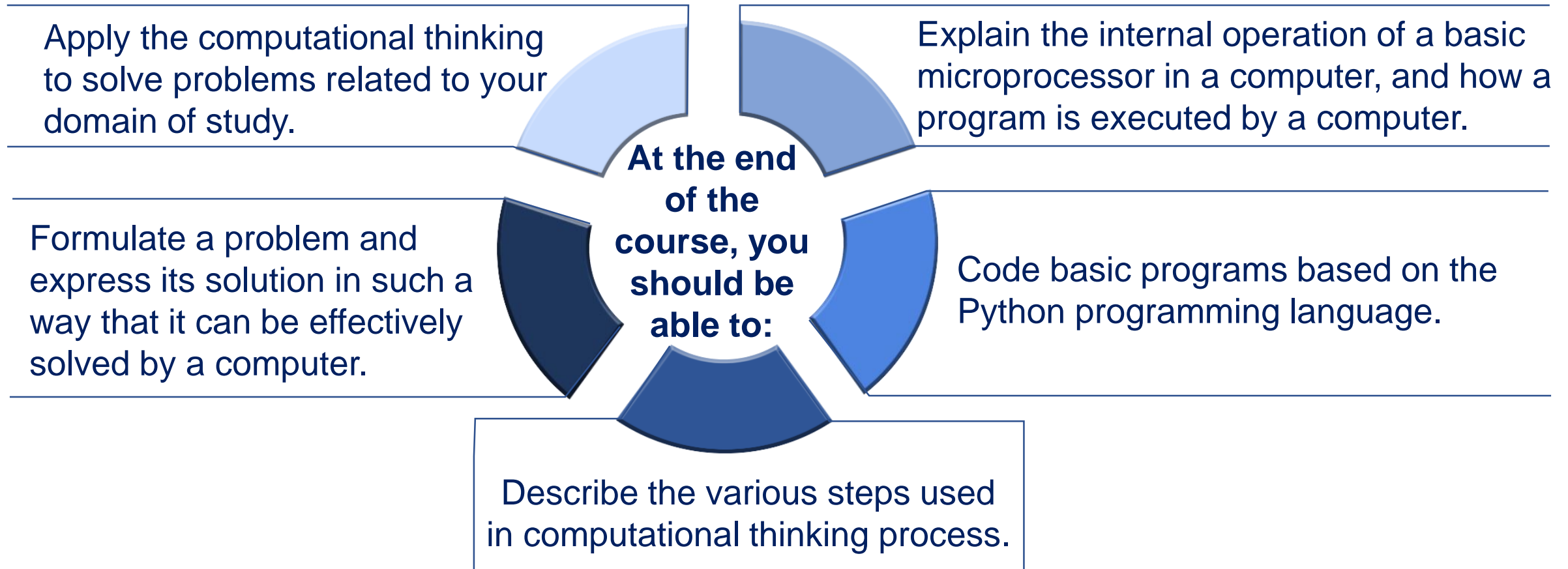
- **Big O notation**
 - to describe and compare the time complexity of algorithms
- **Scalability of algorithms**
 - input data size increases








Computing Trends





Intended Learning Outcomes



References for Images

No.	Slide No.	Image	Reference
1	3		Thinking Problem [Online Image]. Retrieved July 18, 2018 from https://pixabay.com/en/thinking-problem-picture-2987873/ .
2	4, 5		Monitor screen [Online Image]. Retrieved July 18, 2018 from https://pixabay.com/en/monitor-screen-computer-speaker-2455524/ .
3	4, 9		By Wolfdog1 - self-made, CC BY-SA 3.0, retrieved July 18, 2018 from https://en.wikipedia.org/w/index.php?curid=15325014 .
4	4, 10		By Jerry Mason - http://www.sitegroundwebhostingreviews.com , CC BY-SA 4.0, retrieved July 18, 2018 from https://commons.wikimedia.org/w/index.php?curid=56791665 .
5	10		By The original uploader was TexasDex at English Wikipedia. - Transferred from en.wikipedia to Commons by Andrei Stroe using CommonsHelper., CC BY-SA 3.0, retrieved July 18, 2018 from https://commons.wikimedia.org/w/index.php?curid=6557095 .

References for Images

No.	Slide No.	Image	Reference
6	10		Microprocessor [Online Image]. Retrieved July 18, 2018 from https://pixabay.com/en/amd-cpu-processor-microprocessor-1310766/ .
7	10		By Edtech.gr - CC BY-SA 4.0, retrieved July 18, 2018 https://commons.wikimedia.org/w/index.php?curid=69119979 .