

Topic 1.1: Introduction to Algorithms, Programming, and Compilers

LO: 1.1.A, 1.1.B, 1.1.C | Skill: 1.A | Scenario: Algorithms in everyday life — then your first Java program

Standards & Skills Map — Topic 1.1

CED-aligned reference: the learning objectives, essential knowledge, and suggested skill this topic targets. For teacher use during planning, observation, and feedback.

Learning Objectives

- **LO 1.1.A** Represent patterns and algorithms found in everyday life using written language or diagrams.
- **LO 1.1.B** Explain the code compilation and execution process.
- **LO 1.1.C** Identify types of programming errors.

Essential Knowledge

- **1.1.A.1** Algorithms define step-by-step processes for completing a task or solving a problem; they can be represented with written language or diagrams.
- **1.1.A.2** Sequencing defines an order for the steps in a process; steps are completed one at a time.
- **1.1.B.1** Code can be written in any text editor, but an integrated development environment (IDE) is often used because it provides tools to write, compile, and run code.
- **1.1.B.2** A compiler checks code for some errors; errors detectable by the compiler must be fixed before the program can be run.
- **1.1.C.1** A syntax error is a mistake where the rules of the programming language are not followed; these are detected by the compiler.
- **1.1.C.2** A logic error is a mistake that causes the program to behave incorrectly or unexpectedly; these are found by testing with specific data.
- **1.1.C.3** A run-time error occurs during execution and typically causes the program to terminate abnormally.
- **1.1.C.4** An exception is a type of run-time error from an unexpected condition not caught by the compiler; it interrupts the program's normal flow.

Suggested Skill

Skill 1.A — Determine an appropriate program design to solve a problem or accomplish a task.

College & exam alignment

AP Computer Science A is equivalent to a first-semester, college-level introductory programming course taught in Java. The error-type vocabulary and the compile/run model introduced here recur throughout the course and on both exam sections.