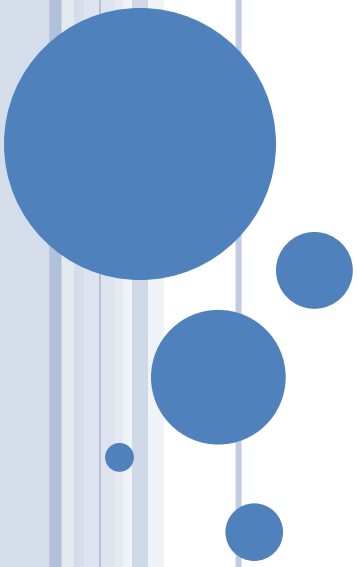


Comp 110 – Introduction to Programming

Instructor: Prasun Dewan

Prerequisites

- None

Computer World

Hardware	Memory
Operating System	Memory Page
Program	Memory Word
Processor	Memory Address
Instruction (e.g. add 2 to 5)	Running a Program
Source Code	Interactive Program
Object Code	Non-interactive (Batch) Program
Programming Language	Program arguments
Machine Language	Runtime
Programmers	Editor
Library (of Code)	Editing Programs
Translator (Compilers/Interpreter)	Lexical Error
Users	Syntax Error
Disks	Semantics Error
	Logic Error
	Debugging
	Style Principles

Theater Analogy

- Play
- Concert
- Talk
- Speech
- Cooking Lessons
- Town Hall Meeting

Theater World – Part 1

Management

Manages

Stage

Performer

Assists

Stagehand

Performance Script

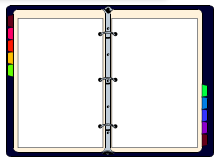
Written in

Performance Language

Follows

Stored in

Notebook or Teleprompter



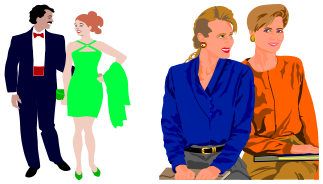
Fetched from

Performs

Archive

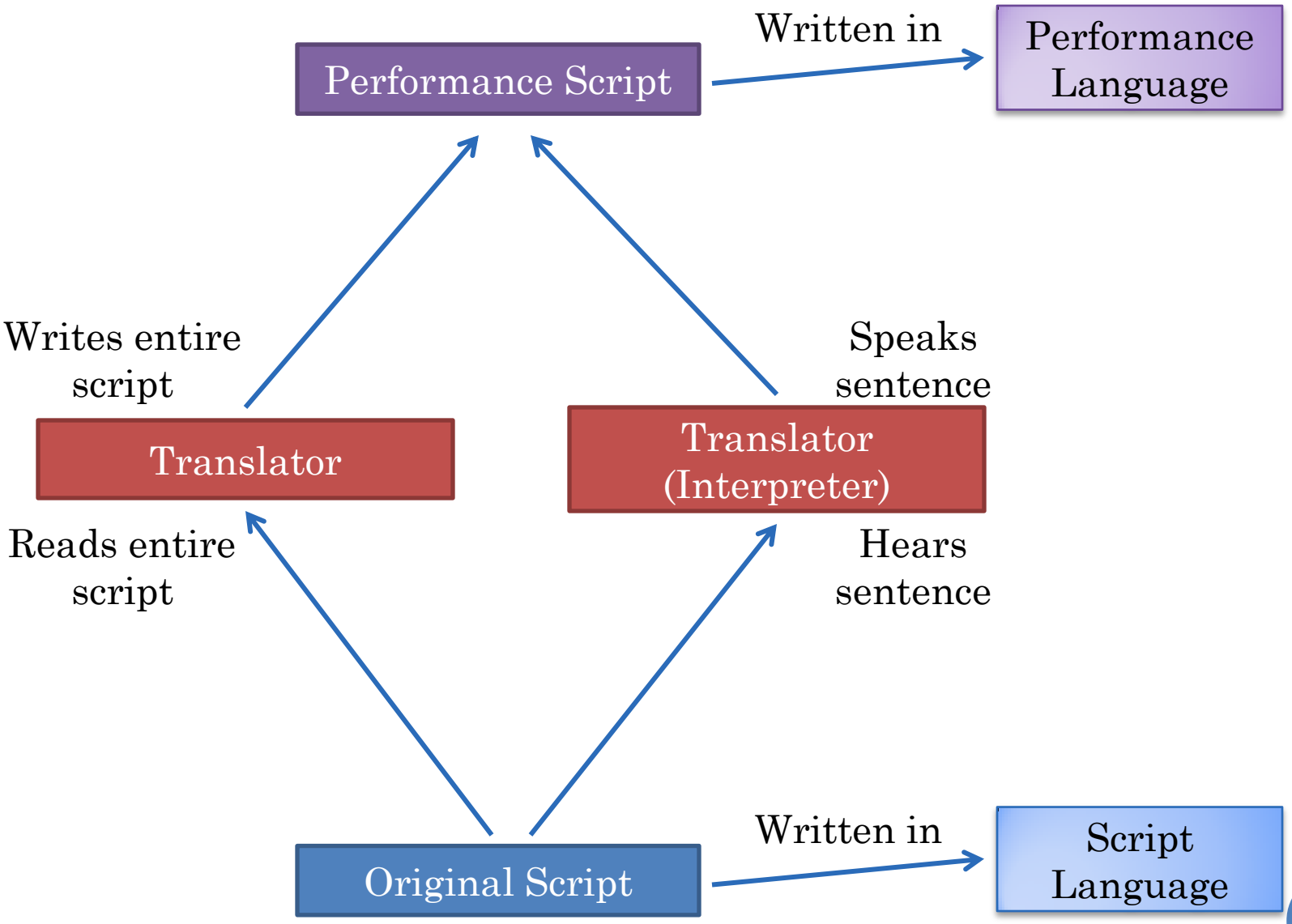
Audience

Real

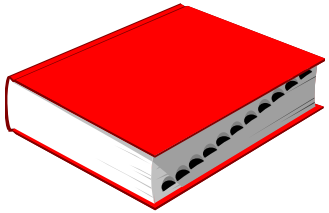


Trial

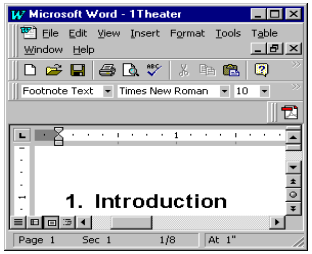
Theater World – Part 2

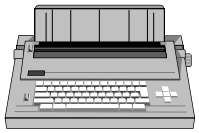


Theater World – Part 3



Reference Material





Typewriter, Text Editor

Word Processor, Script Writer
Translator / Interpreter,
Stagehand, Performer

Links

Secretary

Checked by

Syntax, Semantics,
Logic, & Style

Uses

Script Writer

Problems

Written by

Original Script

Written in

Script Language

Computer World – Part 1

Operating System

Manages

Computer

Processor

Assists

Runtime

Object Code

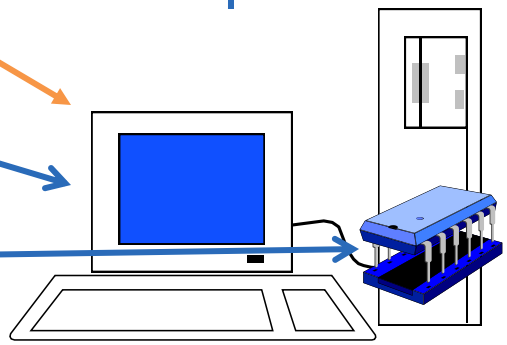
Written in

Machine Language

Follows

Stored in

Memory



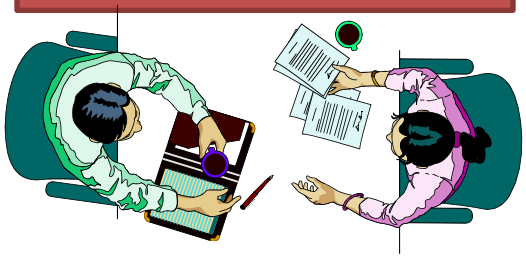
Interacts with

Fetched from

Disk, Tape

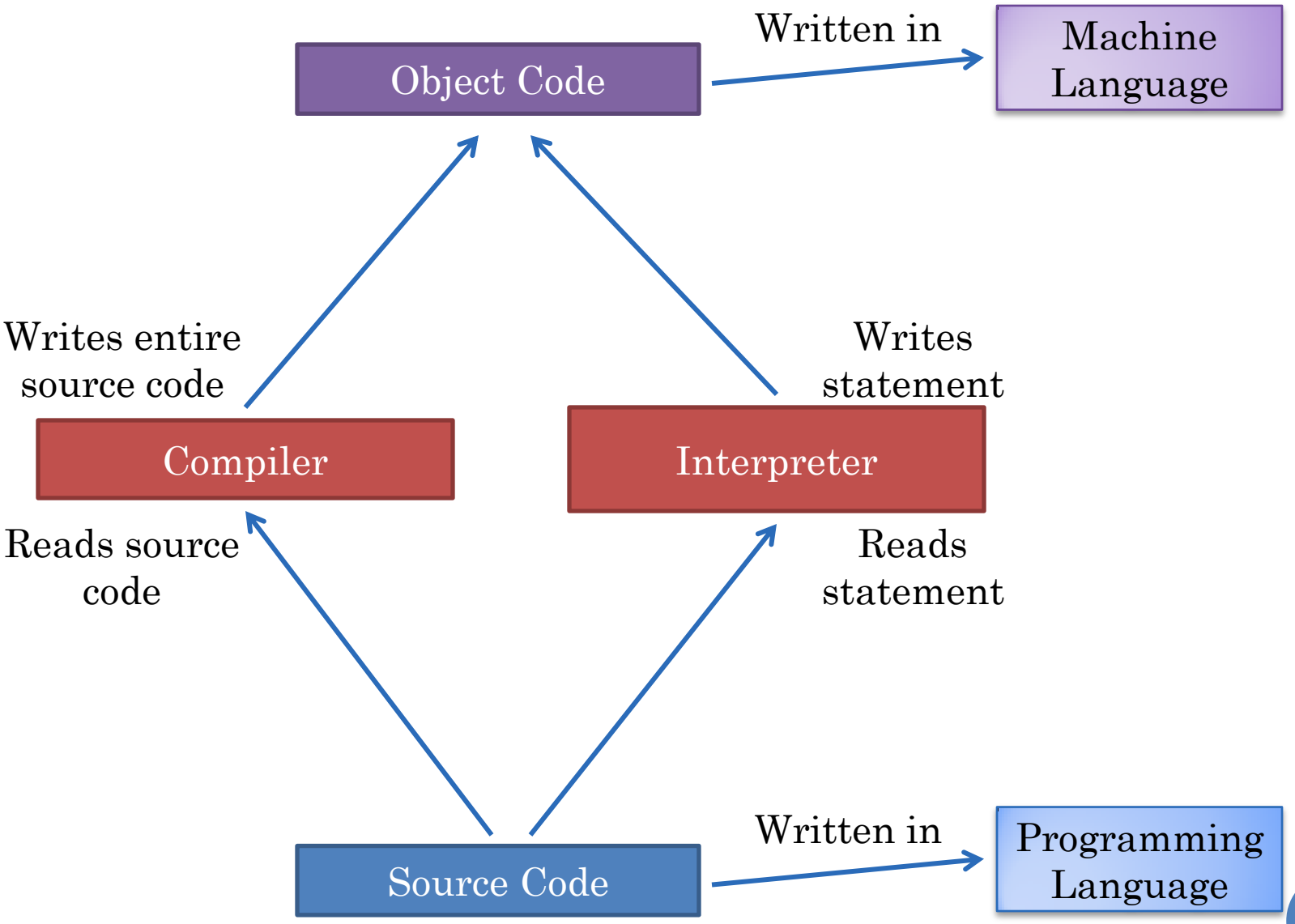
Users

Real

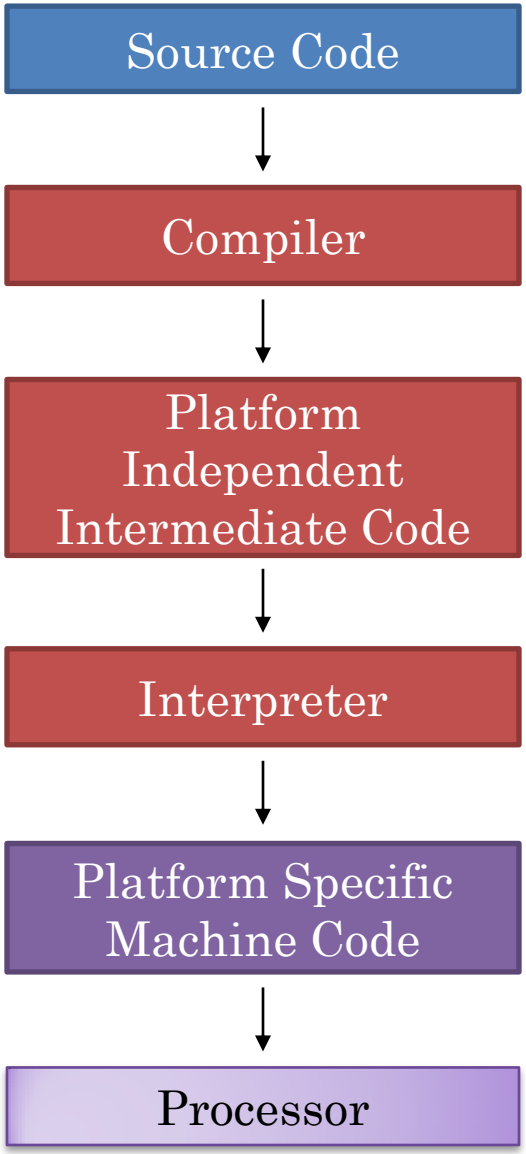


Debugging

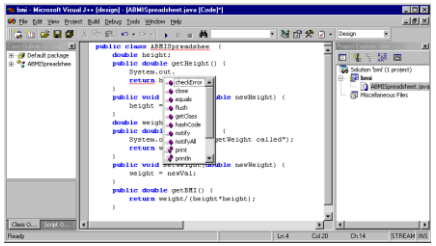
Computer World – Part 2



Translating Using Both a Complier and An Interpreter



Theater World – Part 3



Libraries

Typewriter, Text Editor

Editor, Programmer, Translator, Operating System Runtime, Processor

Links

Linker

Checked by

Syntax, Semantics, Logic, & Style

Uses

Programmer

Problems

Written by

Source Code

Written in

Programming Language

Computer vs. Theater

Computer	Theater
Hardware	Theater
Operating System	Theater Management
Program	Performance
Processor	Performer
Instruction (e.g. add 2 to 5)	Performance action (e.g. walk 3 steps.)
Source Code	Original Script
Object Code	Performance Script
Programming Language	Script Language (e.g. German)
Machine Language	Performance Language (e.g. English)
Programmers	Script Writers
Library (of Code)	Reference Material (from Books)
Translator (Compilers/Interpreter)	Translator (Before/During Performance)
Users	Audience
Disks	Archival Storage Areas
Memory	Script performance notebook accessible to performers
Hardware	Theater

Computer vs. Theater

Computer	Theater
Memory Page	A Notebook Page
Memory Word	A Notebook Line
Memory Address (Page Number, Word Number)	Line Identification (Page Number, Line Number)
Running a Program	Performing a Script
Interactive Program	Performance with audience participation
Non-interactive (Batch) Program	Performance with no audience participation
Program arguments	Special instructions at start of performance
Runtime	Stage-Hands
Editor	Typewriter/Wordprocessor
Editing Programs	Writing Scripts
Lexical Error	Spelling Error
Syntax Error	Grammar Error
Semantics Error	Inconsistencies in Script
Logic Error	Execution Error
Debugging	Staging trial performances
Style Principles	Style Principles

Computer vs. Theater

- CPU is fast: can do several performances at one time.
- CPU is dumb: no improvisation possible.
- Machine language much lower-level than programming language.

Why Java

- Modern, modular (object-oriented) language.
- Good Error Detection.
- Rich Library Embodying Many Good Programming Principles
- Can Write Teaching Tool (ObjectEditor)

Java Versions, Dialects & Programming Enviromnet

- JDK 1.5+
- Eclipse IDE Programming Environment
- Will not matter

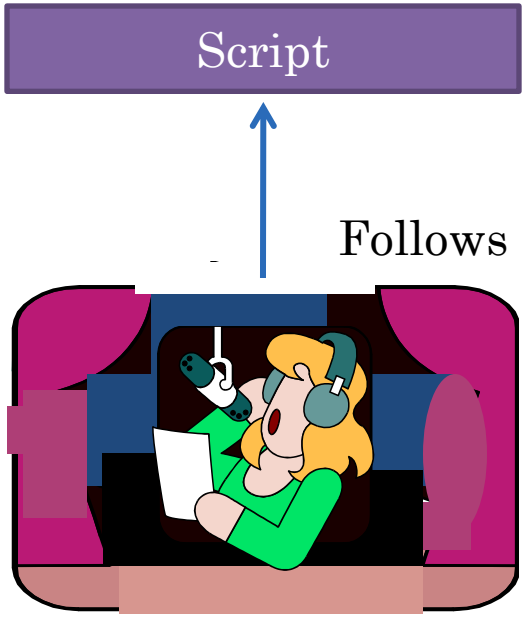
Computer vs. Program Model

Processor

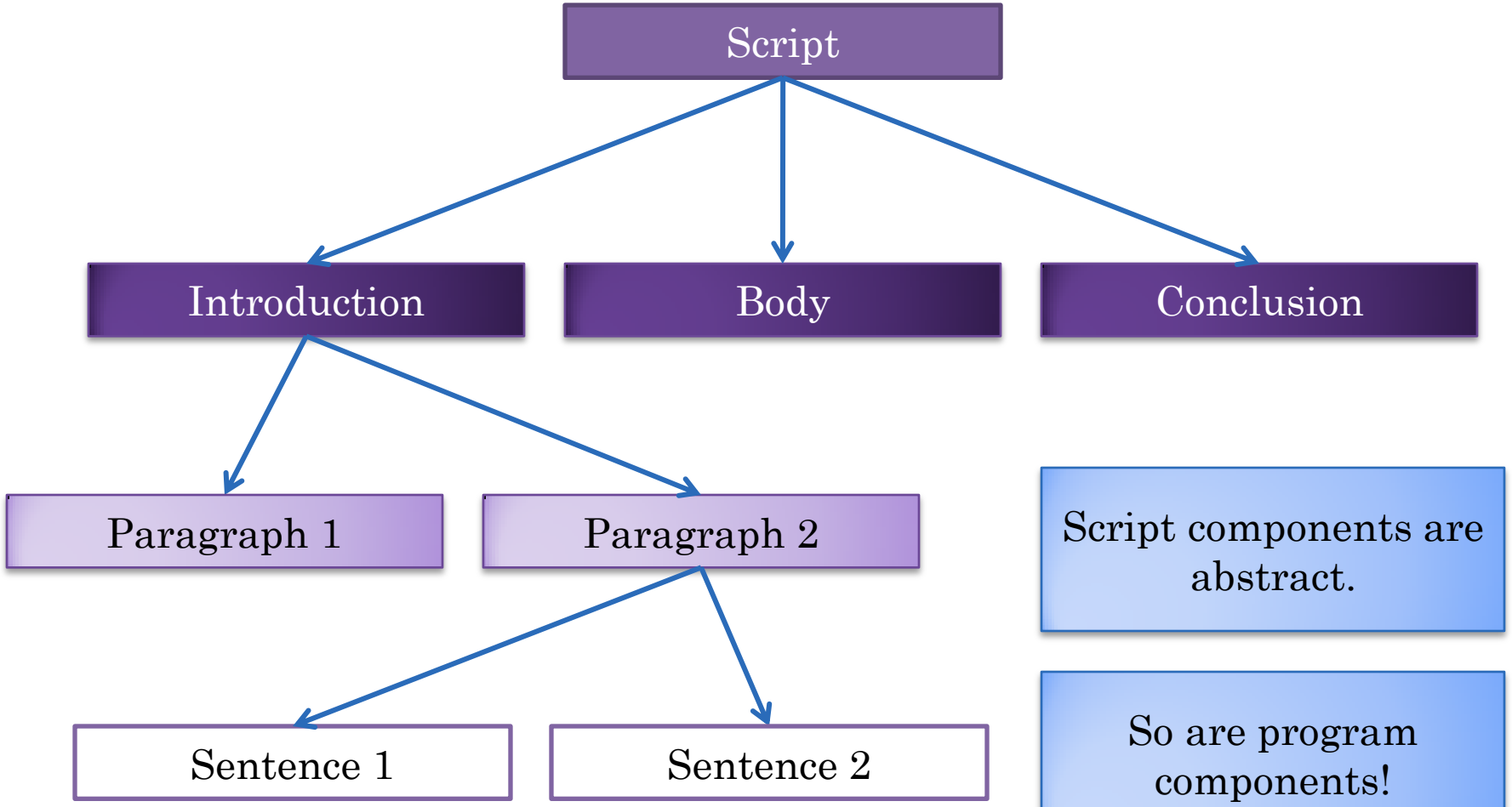
Program
(source code)

Compiler

Structuring in Scripts



Structuring in Scripts



Script components are abstract.

So are program components!

Computer vs. Program Model

Processor

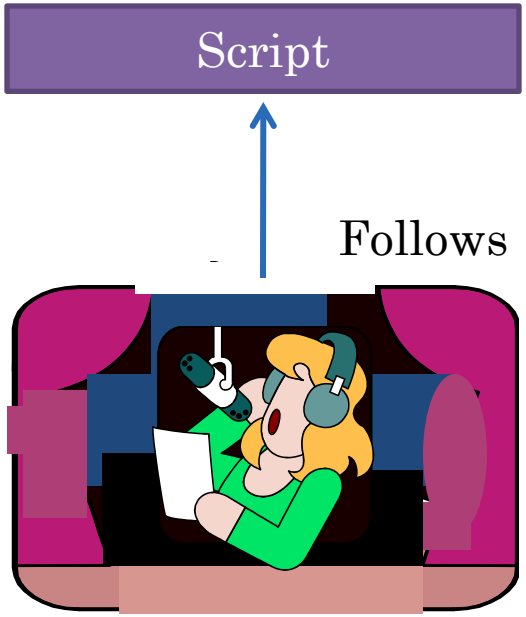
Program
(source code)

Compiler

Outline

- Intuitive Explanation
- Two Concrete Examples
- Calculators
  - square
  - BMI
- Basic Java program elements, programming styles, error handling
- Running and interacting with a Java program

Structuring in Scripts



Structuring in Scripts