Compilation: Preliminaries

Introduction to Compiler Construction

Outline

Outline

Compilers

Interpreters

Phases of Compilation

Why Study Compilers?

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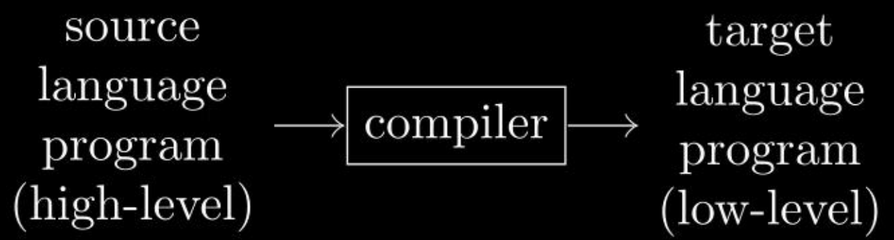
A compiler translates a source language program into a target language program



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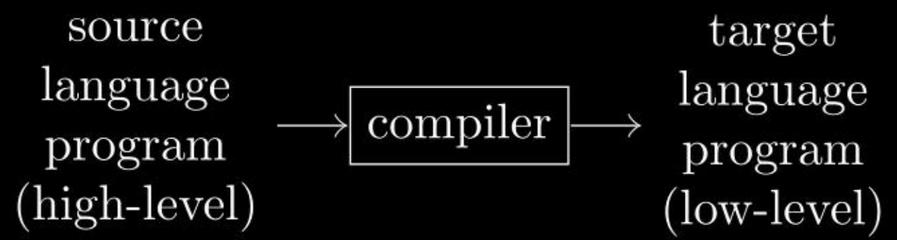

Examples (source language): C, Java, *j--*, *iota*

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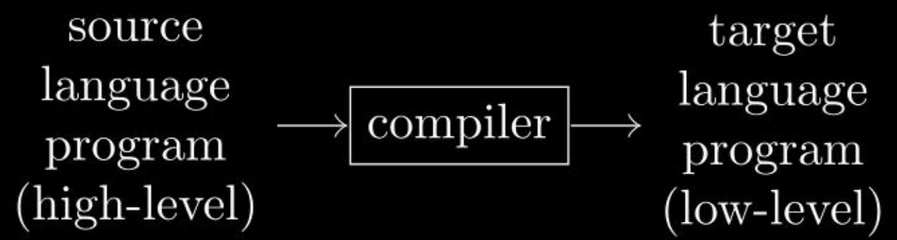

Examples (source language): C, Java, *j--*, *iota*

Examples (target language): Intel x86 instructions, JVM instructions, Marvin Machine instructions

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- Syntax of constructs such as classes, methods, statements, and expressions
- Semantics (ie, meaning) of the constructs

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- Marvin Machine

Interpreters

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Examples: Bash, Python

Phases of Compilation

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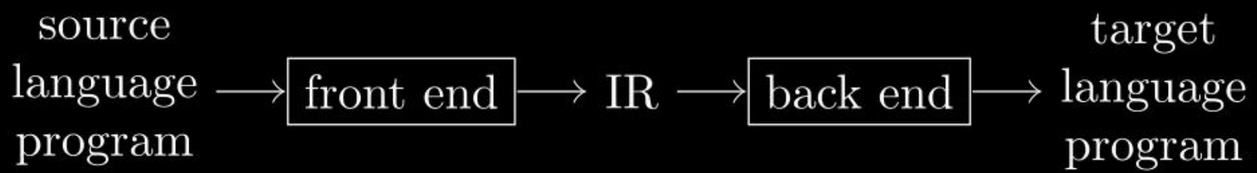
A compiler can be broken into a front end and a back end



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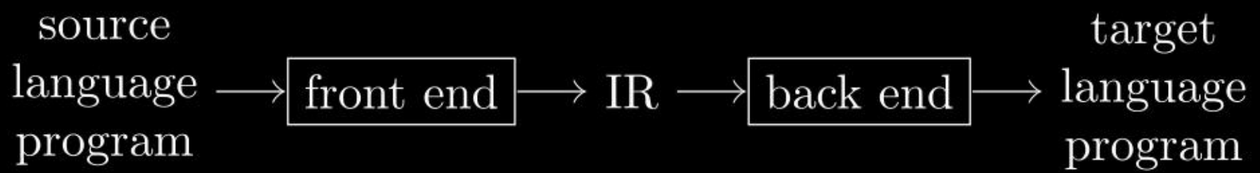

Separating the front end from the back end enables code re-use

Phases of Compilation

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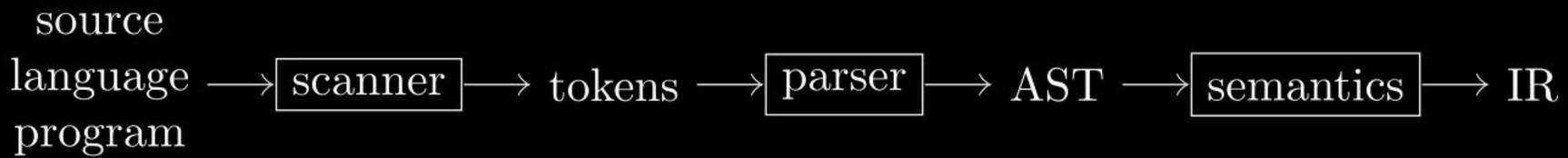
The front end can be decomposed into a sequence of analysis phases



Phases of Compilation

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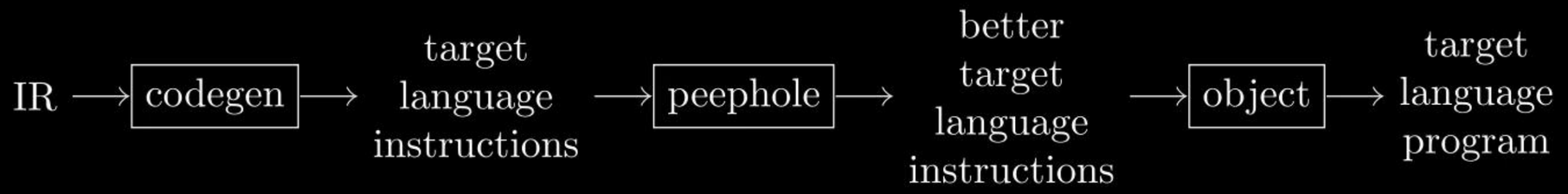
The back end can be decomposed into a sequence of synthesis phases



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A compiler sometimes has an optimizer between the front end and the back end

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Compilers are programs and writing programs is fun