CSEN 202 – Introduction to Computer Programming

Lecture 1: Introduction and overview

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German University Cairo, Faculty of Media Engineering and Technology

February 10/15, 2018

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- Lectures. Divided into 6 groups
  - Sunday 1st and Thursday 2nd slots
    Dr. Mohammed Abdel Megeed
  - Sunday 2nd and Monday 2nd slots.
    Prof.Dr. Slim Abdennadher
  - Thursday 3rd and 4th slots.
    Prof.Dr. Slim Abdennadher

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  - Practical assignments
  - Individual work with feedback and advice from your teaching assistant

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  - Practical assignments
  - Individual work with feedback and advice from your teaching assistant
- Labs.
  - Supervised lab assignments
  - Individual work during the labs

Grading

Tentative weights of the assessments:

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- Final exam 40%

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- Mid-term exam 25%

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- Quizzes 25%
- Lab Assignments 10%

Survival guide

How to succeed in this course:

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- Hang in!
  - Attend lectures, tutorials, and labs, take notes
  - Participate in the discussions, be active
  - Solve the assignments, understand the model solutions provided

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  - Participate in the discussions, be active
  - Solve the assignments, understand the model solutions provided
- Master the infrastructure!
  - Learn how to operate the software (editor, IDE)
  - Understand the interaction (input/output, error messages)
  - Contribute within the team
  - Install relevant software on your own computer/laptop

Remember that this is an introduction to computer programming

Survival guide

How to succeed in this course:

- Do not fall behind!
  - Regularly check the course website for announcements, updates, material, resources

    http://met.guc.edu.eg
  - Ask your TA (during the tutorial / office hours), professor (lecture)

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- Acquire new skills that will allow you to create useful and customized computer-based applications
- It is in the curriculum
- Acquire a useful vocabulary that will impress others in geeky conversations

Course outline

- Introduction to Java
- Fundamental Data Types
- Decisions
- Iteration
- Methods
- Recursion
- Classes and Objects
- Arrays

Today's topics and objectives

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- Background
  - Problem solving
  - Programming languages

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- Java
  - Introduction and history
  - Features and constructs

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  - Programming languages
- Java
  - Introduction and history
  - Features and constructs
- A first program
  - Getting started with Java
  - Some aspects of Java

So what is problem solving?

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The general steps of problem solving are

- Understand the problem
- Dissect the problem into manageable pieces
- Design a solution
- Consider alternatives and refine it
- Implement the solution
- Test the solution and fix any problems that exist

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- This technique is fundamental to software development. We will see how Java supports this approach.

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- A programming language employs a set of rules that dictate how the words and symbols can be put together to form valid program statements.
- Examples of Programming Languages:
  - Fortran
  - Cobol
  - C
  - C++, C#
  - Pascal
  - Prolog
  - JAVA

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There are four programming languages levels:

- Fourth-generation language — Higher order programming language that introduces complex abstractions and concepts
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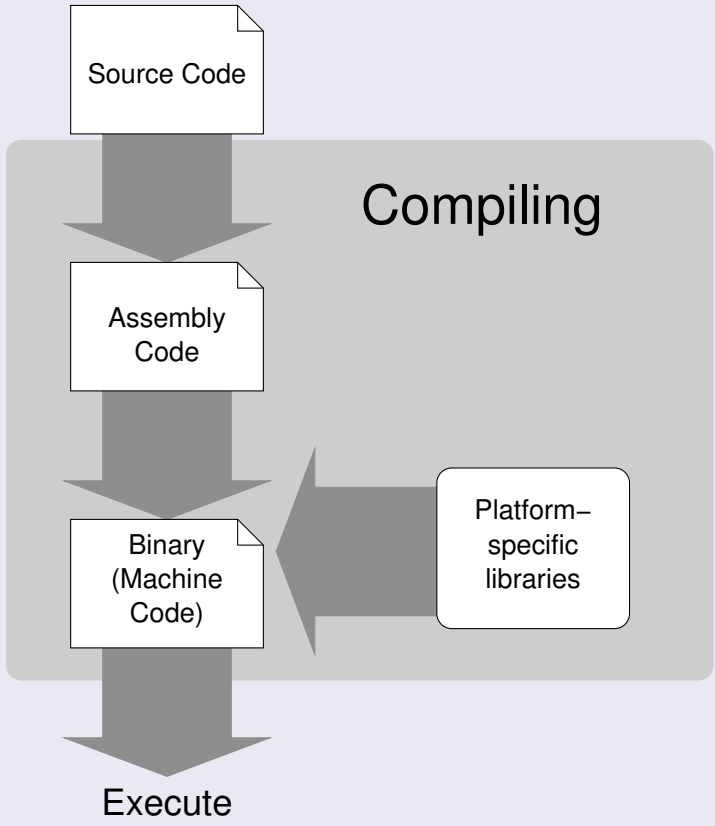
- Assembly language — Somewhat human-readable mnemonics that encode machine language (hardware-platform specific)
- Machine language — A byte-stream that can directly be processed by computing hardware (hardware-platform specific)

The normal compilation procedure

Translating/compiling a program (simplified)



What is Java?

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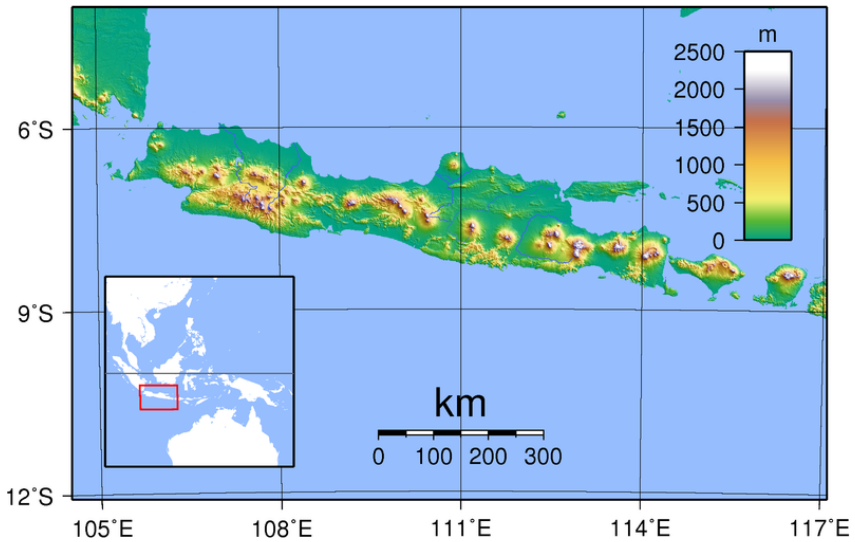

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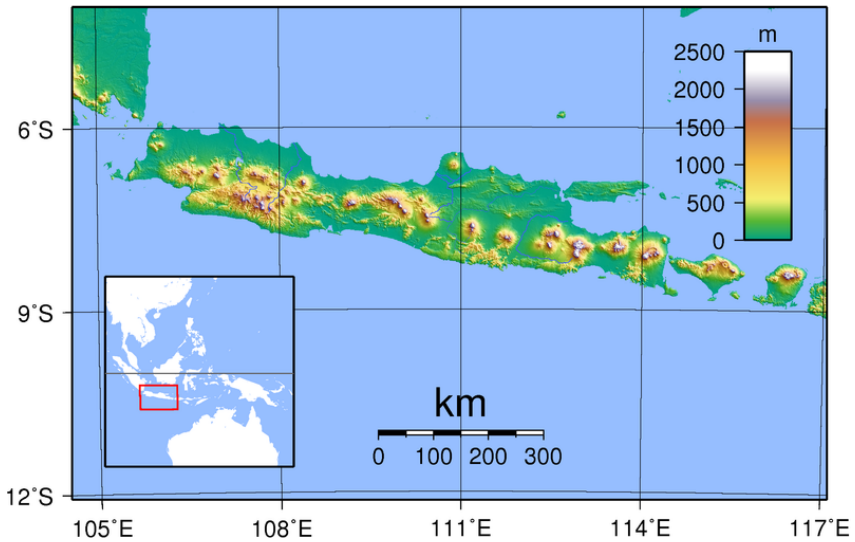

They grow a lot of coffee there.

What is Java?

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Programmers run on coffee.

What is Java?

It is the name of a programming language, because programmers love coffee.

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Seriously.

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- New goal was a general purpose language with an emphasis on portability and interpretation

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- Disadvantages:
  - Slower than C (more overhead)
  - Limits user ability

Hello world

The first Java program

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public class Hello {
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- The method `main` is the code that runs when you execute the program

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- Notice the lack of `.class` extension

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- The JVM for a platform reads byte code and executes it on that platform at run time.

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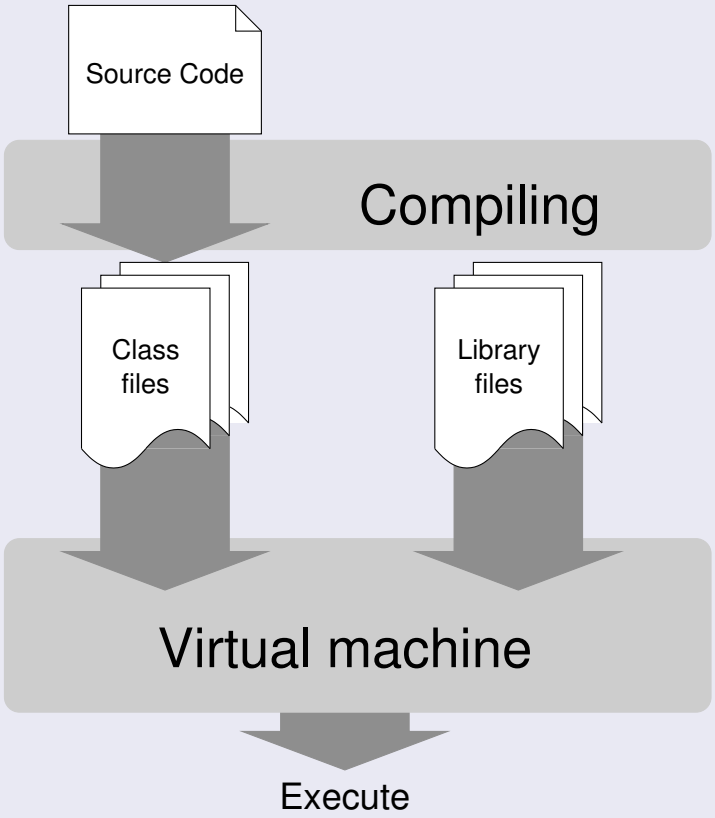

Concepts that we will handle later

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- The parameter `String[] args` contains the command line arguments

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- The keyword **`static`** means that `main` does not inspect or change objects of the `Hello` class.
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- The `System` class contains useful objects and methods to access system resources.

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- The `println` method will print a line of text.

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  - Must be different from any Java reserved words (or keywords).
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- We should try to use descriptive names.

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- Second kind of comments:

```
// This is the other type of comment.
// It covers the entire line
// and requires a new set
// of slashes for each new line.
```

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- Third kind of comments:

```
/** This is a javadoc comment. It
    also spans a several lines.    */
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- Runtime errors: Detected by the JVM when it is too late
  - `System.out.print(1/0);`