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# CSYE 6200

## Concepts of Object Oriented Design

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# Java Program

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- Lecture

1. Constants

2. Variables: NOT INITIALIZED BY  
DEFAULT

1. Char

2. integer

3. float

3. Scope

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- Java is all about Classes

- A Class is used to instantiate (i.e., create) one or more Objects

Java program is made up of various classes

- User created classes
  - Libraries: Pre-existing classes

- Java Class Libraries

- Classes organized in packages

- We ALWAYS create OUR classes in packages

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- Java Program

- Create Java source (.java) file

- editor or Integrated Design Environment (IDE)
    - javac Hello.java

- Compile source file

- Compiler (javac) creates .class file

- Load classes (.class) into memory

- Class loader loads class files from disk

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- Java Program

- Verify

- Byte code verifier: checks byte codes in each class for security

- JVM

- Just-in-time (JIT) compiler translates bytecodes into machine specific language for execution

NOTE: Java Program execution begins in the main method

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- Java Types
    - Primitive Types
      - boolean, char, short, int, float, long, double.
      - Stack memory allocation
    - Non-Primitive (Reference) Types
      - Used to reference and hold Objects, e.g. String
      - Heap memory allocation
  - Java is
    - a STRONGLY TYPED LANGUAGE
    - a STATICALLY TYPED LANGUAGE

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- Java is a **STRONGLY TYPED LANGUAGE**
    - All variables are required to have types
  - Java is a **STATICALLY TYPED LANGUAGE**
    - Once assigned a type variables retain that type assignment for duration of program execution
      - EXCEPTION: type casting



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- Classes are Reference types
    - Class variable holds reference (i.e. pointer) to actual object allocation on heap
  - Class methods (like functions)
    - Each supplied argument must have a type
    - The return value must have types
    - Methods which do not return a value use void

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- 8 Primitive Types

- boolean: ONLY true or false
- byte: 8-bits
- char: 16-bits
- short: 16-bits
- int: 32-bits
- float: 32-bits
- long: 64-bits
- double: 64-bits

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- Online Information

- Java 8

- <http://docs.oracle.com/javase/8/docs/api/index.html>

- Java 7

- <http://docs.oracle.com/javase/7/docs/api/index.html>

- Java 16

- <https://docs.oracle.com/en/java/javase/16/docs/api/index.html>

- Java 20

- <https://docs.oracle.com/en/java/javase/20/docs/api/index.html>