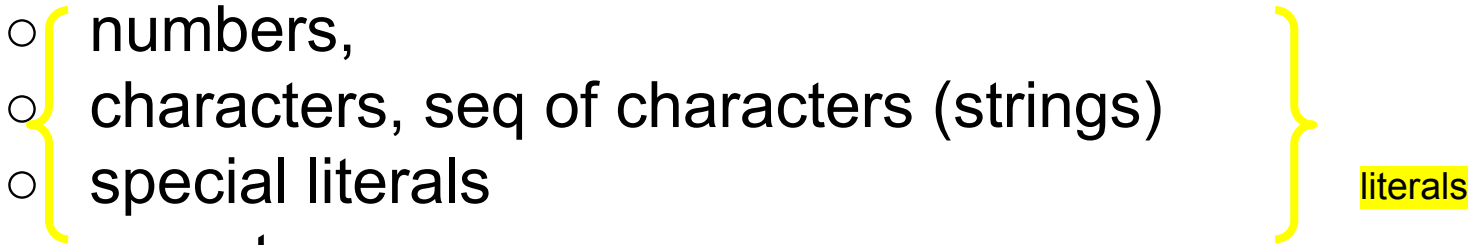# Tinker Academy

AP Computer Science Prep (Java DS & Algo)

Lecture 1 - Java Fundamentals 2 (Literals)

Winter 2015

Lecture 1 - Java Fundamentals 2

Compilation Process
- Java source code split into "token" sequence
- Tokens are either
  - numbers,
  - characters, seq of characters (strings)
  - special literals
  - operators
  - language keywords
  - identifiers
  - punctuation, comments, whitespace

literals

Literals

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Common Literals

- Strings (within double quotes "")
- chars (within single quotes '')
- integers (no quotes)
- numbers (no quotes)

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Java Program

```java
/**
 * HelloWorld is a Java Class
 * The entire code for HelloWorld is contained in this file "HelloWorld.java"
 */
public class HelloWorld {
    // main is a Java Method. Other programs can send messages to the main method
    public static void main(String[] args) {
        String message = "Hello World";
        System.out.println(message); // prints Hello World to the console
        char c = 'A'
        System.out.println(c);   // prints A onto the console
        int a = 2048;
        System.out.println(a);   // prints 2048 onto the console
    }
}
```

HelloWorld.java

Number Literals

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Compilation Process (Number Tokens)
- Numbers can be
  - integers (...-1,-2,0,1,2…)
  - decimals (3.14159265…)
- Numbers are stored in memory
- integers occupy 4 locations (32 bits)
- decimals occupy 8 locations (64 bits)

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Number Token	Treated as	# Locations for Storage
-1	Integer	4
0	Integer	4
1	Integer	4
1L	Long Integer	8
-100l	Long Integer	8
3.141592	Double Precision Number	8
3.141592f	Single Precision Number	4
-2E3	Double Precision Number (-2000)	8

Character Literals

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Compilation Process (Character Tokens)
- Upto 65,536 different characters (called chars)
- Upper case is different from lower case
- Each character has a number code
- Sequence of characters is called a String
- length of Strings is the number of characters

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Character Token	Number Code	Treated as	# Locations for Storage
'c'	99	Character (char)	1
'C'	67	Character (char)	1
'1'	49	Character (char)	1

chars use single quotes

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Character Sequence Token	Number Codes	Treated as	# Locations for Storage
"Hello World"	72,101,108,108,111,32,87,111,114,108,100	String	1

Strings use double quotes
Number codes are based on ASCII

Special Literals

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Special Literal	Means
true	Boolean value of TRUE
false	Boolean value of FALSE
null	A value that does not refer to any object

*arrays will be covered in a future lecture

Class Activity