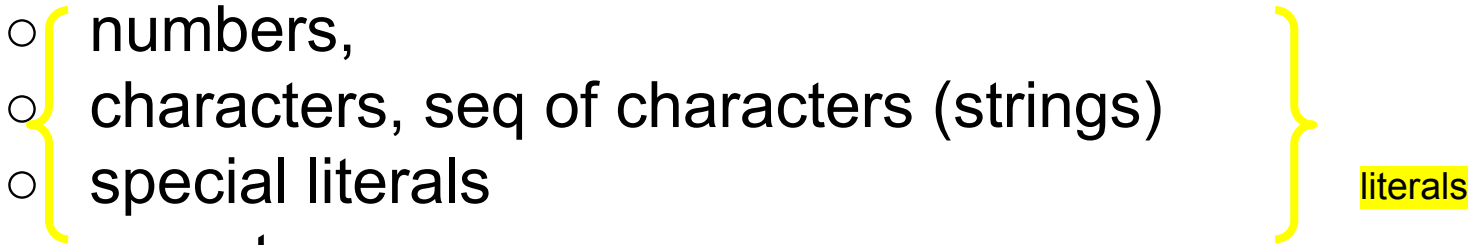


# Tinker Academy

AP Computer Science Prep (Java DS & Algo)  
Lecture 3 - Java Fundamentals 2  
(Operators)

# Lecture 3 - Java Fundamentals 2

## Compilation Process

- Java source code split into “token” sequence
- Tokens are either
  - numbers,
  - characters, seq of characters (strings)
  - special literals

literals

- operators
- language keywords
- identifiers
- punctuation, comments, whitespace

# Operators

# Lecture 3 - Java Fundamentals 2

Arithmetic Operators (AP Java Subset 2014)		
Operator	Operation	Example
+	Addition	// Variable a has the value 2 int a = 1 + 1;
-	Subtraction	//Variable a has the value 0 int a = 1 - 1;
*	Multiplication	// Variable a has the value 1 int a = 1 * 1;
/	Division	int a = 3 / 2; // (Integer Division) Answer will be 1 a = 3 / 2.0 // (Number Division) Answer will be 1.5
%	Modulus (Remainder)	int a = 3 % 2 // (Answer will be 1) a = 2 % 2 // (Answer will be 0) a = 1 % 2 // (Answer will be 1)

$x = qc + r$   
x is the number  
c is the modulus  
r must be non neg

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## Assignment Operators (AP Java Subset 2014)

Operator	Operation	Example
=	Assignment	// a is assigned the value 2 int a = 2;
+=	Combined addition + assignment	// a is assigned the value 4 int a; a += 4;
*=	Combined multiplication + assignment	// a is assigned the value 12 int a; a *= 3;
/=	Combined division + assignment	// a is assigned the value 3 int a; a /= 4;
%=	Combined modulus + assignment	// a is assigned the value 0 int a; a %= 3;

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## Relational Operators (AP Java Subset 2014)

Operator	Operation	Example
==	Equals	// Variable a is true boolean a = 2 == 2;
!=	Not Equals	// Variable a is false boolean a = 2 != 2;
<	Less Than	// Variable a is false boolean a = 2 < 2;
<=	Less Than Or Equal	// Variable a is true boolean a = 2 <= 2;
>	Greater Than	// Variable a is false boolean a = 2 > 2;
>=	Greater Than Or Equal	// Variable a is true boolean a = 2 >= 2;

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## Increment/Decrement Operators (AP Java Subset 2014)

Operator	Operation	Example
++	Postfix increment	// Variable a is 1 int a; a++;
--	Postfix decrement	// Variable a is -1 int a; a--;

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## Logical Operators (AP Java Subset 2014)

Operator	Operation	Example
&&	AND	// a is false boolean a = 2 > 1 AND 3 < 2;
	OR	// a is true boolean a = 2 > 1 AND 3 < 2;
!	NOT	// a is false boolean a = !(2 > 1);



# Lecture 3 - Java Fundamentals 2

## String Operators (AP Java Subset 2014)

Operator	Operation	Example
+	Concatenate Strings	// Variable a is "Hello World" String a = "Hello" + " " + "World";

# Lecture 3 - Java Fundamentals 2

Special Operators		
Operator	Operation	Example
new	Creates new objects	// Variable a is an Object Object a = new Object();

# Expressions

# Lecture 3 - Java Fundamentals 2

## Expressions

- Operators are used to generate expressions
- Expressions have a value
- Expressions can be combined into larger expressions

# Lecture 3 - Java Fundamentals 2

Expressions	
Arithmetic	$((1 + 1) / (2 + 3)) * 5 \% 2$
Assignment	<pre>int a = 0; a = a + 2 * a / 5;</pre>
Relational	<pre>int a; boolean b; b = (a == 1)    (a % 2 == 0);</pre>
String	<pre>String a = "Happy "; a = a + ""Birthday " + "to " + "you";</pre>

# Class Activity