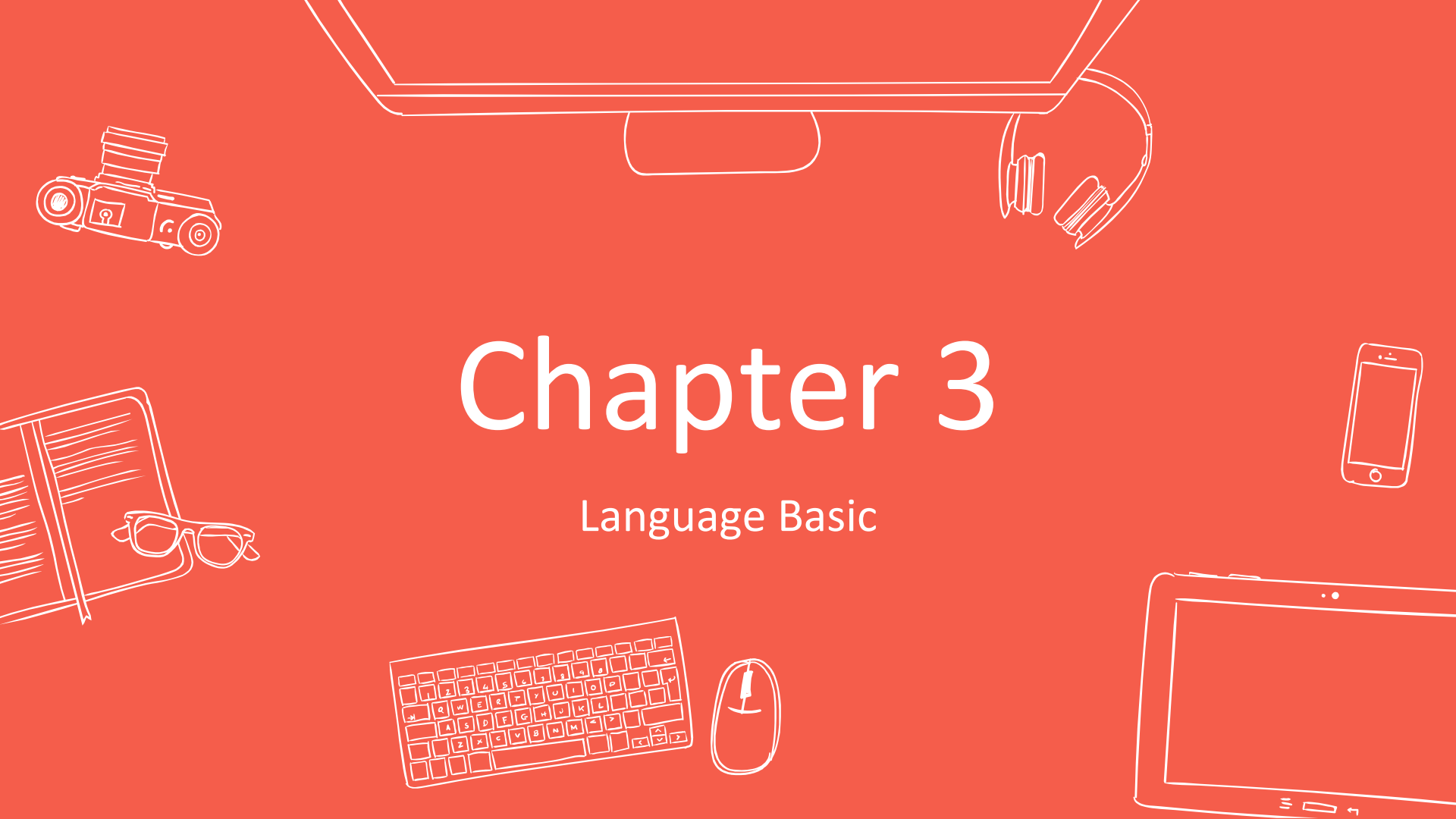


Chapter 3

Language Basic

Language Basic

Comments

Variable

Operators

Expression, Statement and Block

Control Flow

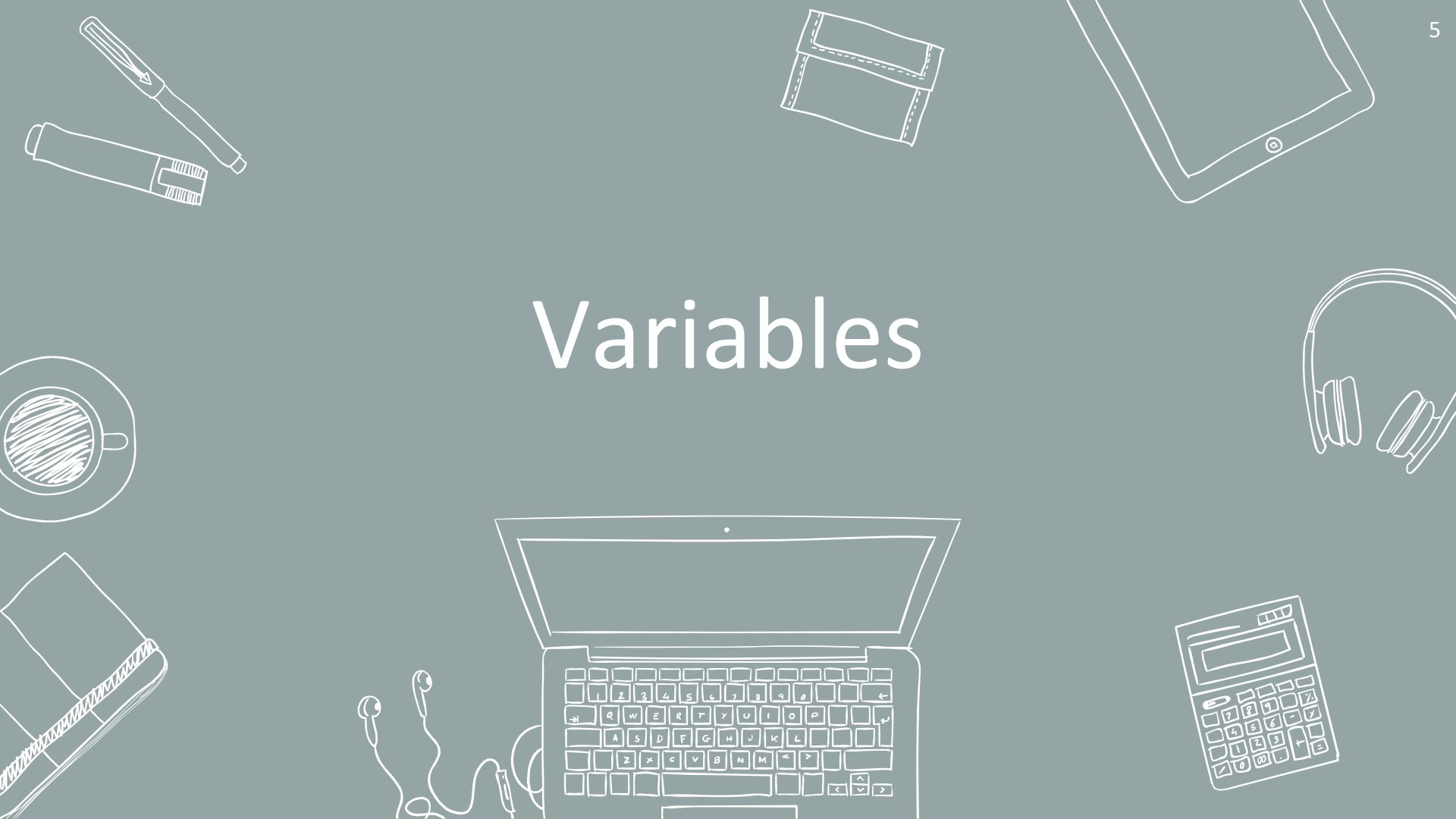
Comments

Comment

Java supports following type of comments

- Single line comment
  - E.g. // This is test
- Multi-line comment
  - E.g. /* This is test */
- Java Doc comment
  - E.g. /** Class, Method or vairable document comment */

Variables



Variable Names

Case-sensitive

Naming

- Can begin with a letter, $ or _.
- Can not start with number
- White space is not permitted.
- Subsequent characters may be letters, digits, $, or _.

Use camel case for variable name

Variable Names

For constants use all uppercase with underscore character as separator

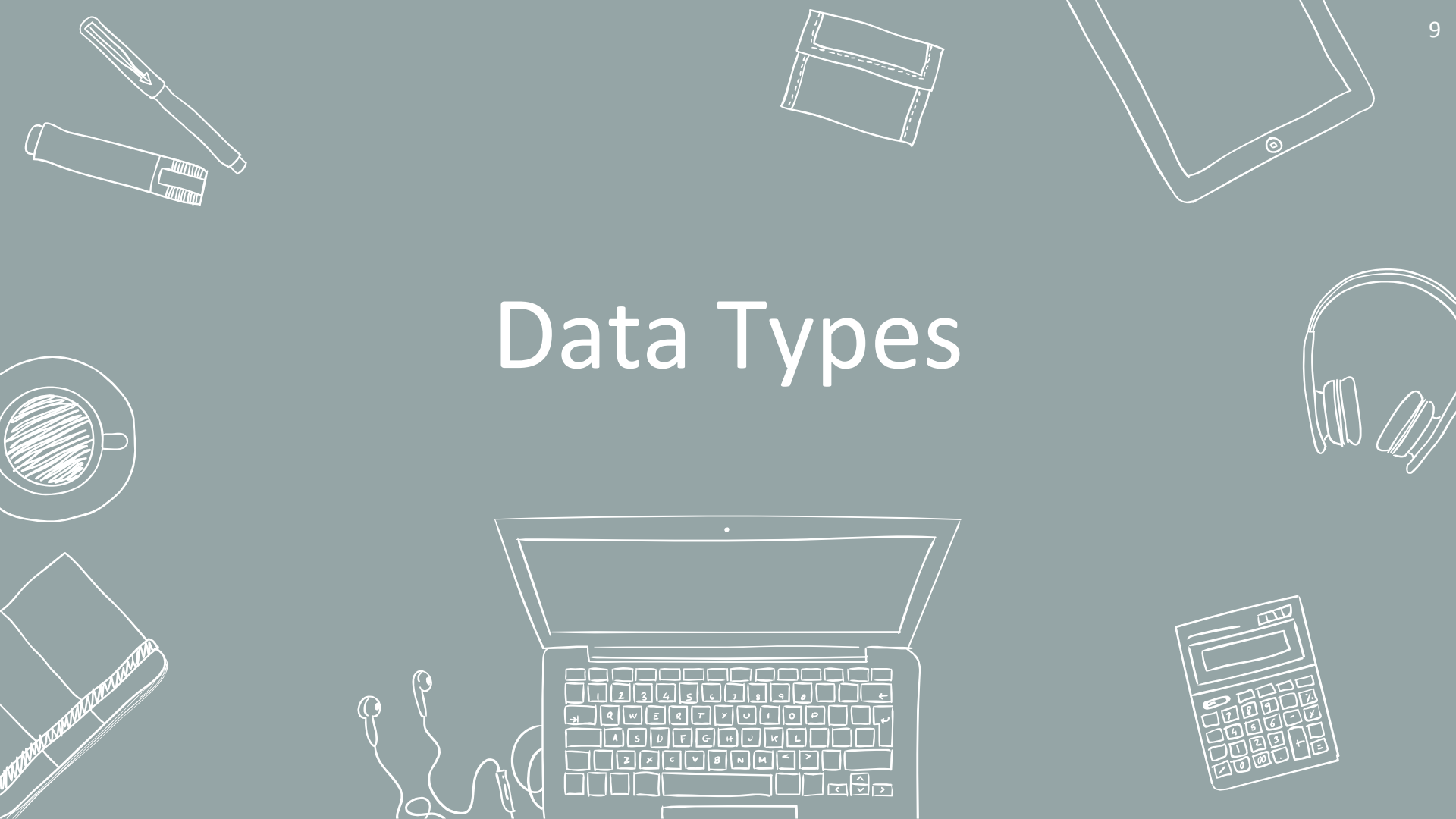
Parameter always start with a prefix

Use “this” prefix for instance variable.

Variables Example

```
int numberOfStudents;
float  PI_VALUE = 3.14;
int add (int aFirstNumber, int aSecondNumber) {
return aFirstNumber  + aSecondNumber  -
this.index;    }
String NULL_VALUE = null;
```

Data Types



Data Type

Primitive Data Types

Object Data Type

Primitive Data Types

byte: The byte data type is an 8-bit signed two's complement integer. It has a minimum value of -128 and a maximum value of 127 (inclusive).

short: The short data type is a 16-bit signed two's complement integer. It has a minimum value of -32,768 and a maximum value of 32,767 (inclusive).

int: The int data type is a 32-bit signed two's complement integer. It has a minimum value of -2,147,483,648 and a maximum value of 2,147,483,647 (inclusive).

long: The long data type is a 64-bit signed two's complement integer. It has a minimum value of -9,223,372,036,854,775,808 and a maximum value of 9,223,372,036,854,775,807 (inclusive).

Primitive Data Types

float: The float data type is a single-precision 32-bit IEEE 754 floating point. **This data type should never be used for precise values, such as currency**. For that, you will need to use the java.math.BigDecimal class instead.

double: The double data type is a double-precision 64-bit IEEE 754 floating point.For decimal values, this data type is generally the default choice. **As mentioned above, this data type should never be used for precise values, such as currency**.

boolean: The boolean data type has only two possible values: true and false. Use this data type for simple flags that track true/false conditions.

char: The char data type is a single 16-bit Unicode character. It has a minimum value of '\u0000' (or 0) and a maximum value of '\uffff' (or 65,535 nclusive).

Default Value

Data Type	Default Value (for fields)
byte	0
short	0
int	0
long	0L
float	0.0f
double	0.0d
char	'\u0000'
String (or any object)	null
boolean	false

Literals

```
boolean result = true;
char capitalC = 'C';
byte b = 100;
short s = 100;
int i = 100000;
//  The number 26, in hexadecimal
int hexVal = 0x1a;
// The number 26, in binary
int binVal = 0b11010;
double d1 = 123.4;
// same value as d1, but in scientific notation
double d2 = 1.234e2;
float f1  = 123.4f;

long creditCardNumber = 1234_5678_9012_3456L;
float pi =  3.14_15F;
long hexBytes = 0xFF_EC_DE_5E;
```

Quiz

Which of the following is *not* a valid comment:

a. /** comment */
b. /* comment */
c. /* comment
d. // comment

Operators

Operators

Operators are special symbols that perform specific operations on one, two, or three operands, and then return a result.

Operators with higher precedence are evaluated before operators with relatively lower precedence.

All binary operators except for the assignment operators are evaluated from left to right; assignment operators are evaluated right to left.

Operators

Simple Assignment Operator

= Simple assignment operator

E.g.:

numberOfPizza = 3;

Operators

Arithmetic Operators

- `+` Additive operator (also used for String concatenation)
- `-` Subtraction operator
- `*` Multiplication operator
- `/` Division operator
- `%` Remainder operator

E.g.:

```
total = number1 + number2;
diff  = number1 – number2;
```

Operators

Unary Operators

+	Unary plus operator; indicates positive value (numbers are positive without this, however)
-	Unary minus operator; negates an expression
++	Increment operator; increments a value by 1
--	Decrement operator; decrements a value by 1
!	Logical complement operator; inverts the value of a Boolean

E.g.:

```
number1 = 10;

number1++;

largeNumer = true;

smallNumber = ! largeNumer
```

Operators

Equality and Relational Operators

==	Equal to
!=	Not equal to
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to

E.g:

```
number1 = 10; number2= 20;
areNumberEqual = (number1 == number2);
greater = number1 > number2
```

Operators

Conditional Operators

&& Conditional-AND

|| Conditional-OR

?: Ternary (shorthand for if-then-else statement)

E.g.:

```
allNumberMoreThan100 = num1 > 100 && num2 > 100
atleastOneNumberMoreThan100 = num1 > 100 || num2 > 100
maxNumber = num1 > num2 ? num1 : num2;
```

Operators

Type Comparison Operator

instanceof	Compares an object to a specified type

Bitwise and Bit Shift Operators

~	Unary bitwise complement
<<	Signed left shift
>>	Signed right shift
>>>	Unsigned right shift
&	Bitwise AND
^	Bitwise exclusive OR
|	Bitwise inclusive OR

Operator Precedence

Operator Precedence

Operators	Precedence
postfix	`expr++ expr--`
unary	`++expr --expr +expr -expr ~ !`
multiplicative	`* / %`
additive	`+ -`
shift	`<< >> >>>`
relational	`< > <= >= instanceof`
equality	`== !=`
bitwise AND	`&`
bitwise exclusive OR	`^`
bitwise inclusive OR	`|`
logical AND	`&&`
logical OR	`||`
ternary	`? :`
assignment	`= += -= *= /= %= &= ^= |= <<= >>= >>>=`

Thanks!

Any questions?

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