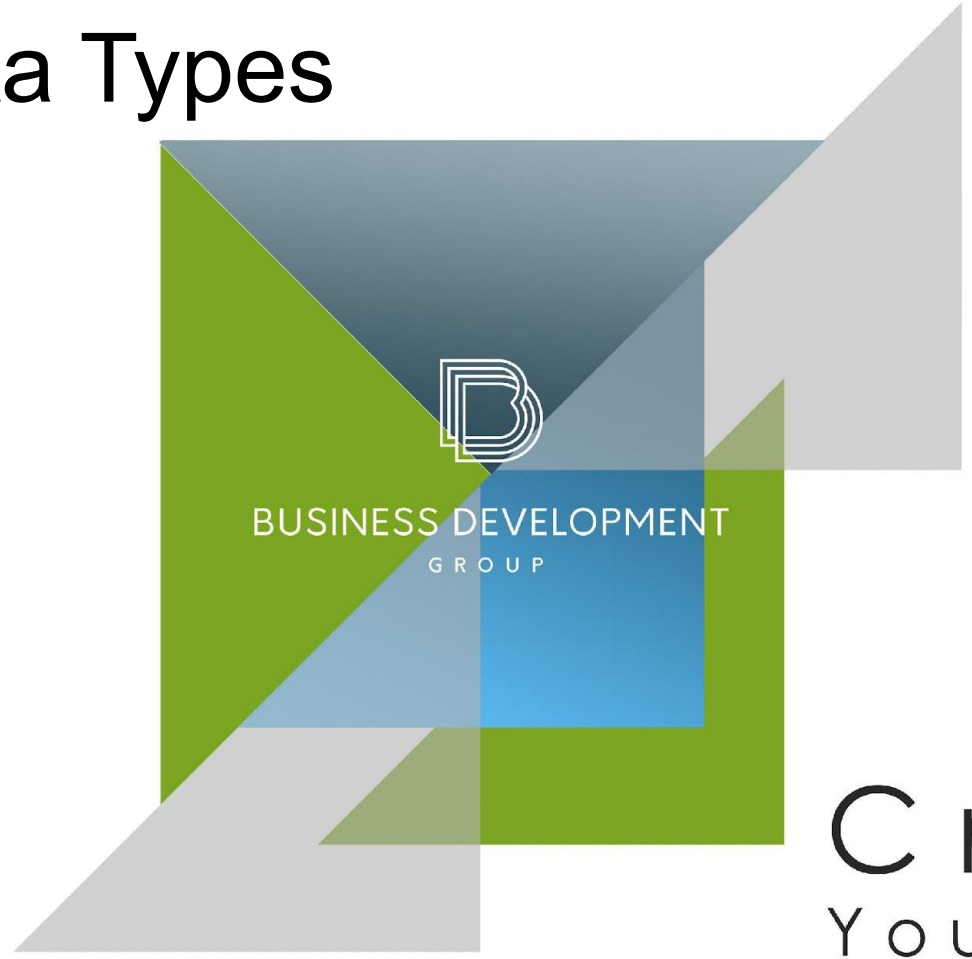
Java Data Types



Create
Your Future

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Consider the following points

- Comments
- Identifiers
- Variables
- Primitive types
- Reference types
- Casting in Java
- String Data Type

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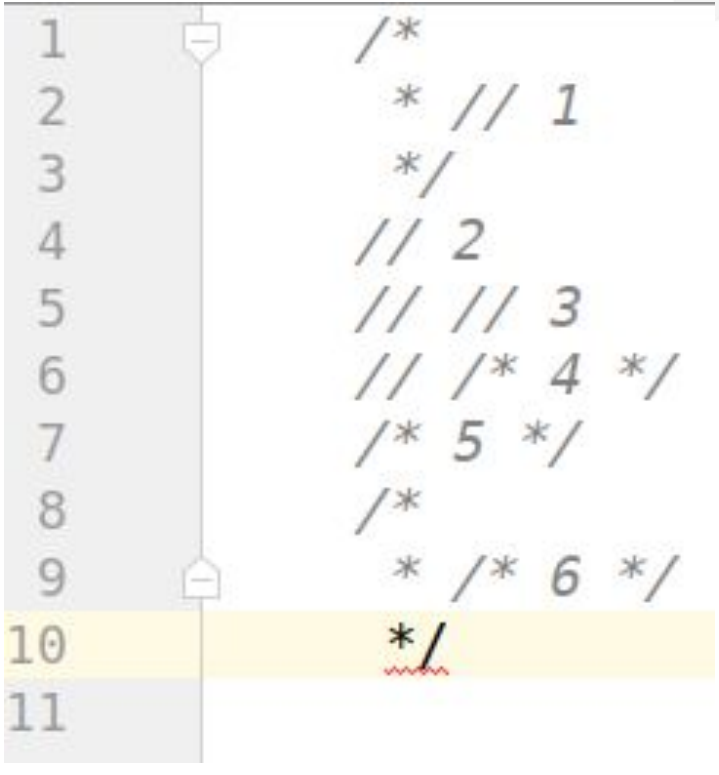
Comments

1. // Single-line comment
2. /* Multiple
   * line comment
   */
3. /**
   * Javadoc multiple-line comment
   * @author Aren Mayilyan
   */



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Identifiers

- Examples

- Ok
- $Ok
- _ok12_7
- _$_001
- Public

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Variables

- **Local** (method) – from declaration to end of block.

- **Instance** (field) – from declaration until garbage collected.

- **class** (static) – from declaration until program ends.

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Java Types

- **- Primitive**
  - Logical: boolean
  - Textual: char
  - Integral: byte, short, int, long
  - Floating: float, double
- **- Reference**
  - All others

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Key Differences

- Primitives can’t be null:
  - - int value = null; // Doesn’t compile
- Primitives don’t have methods:
  - - String reference = “hello”;
  - - int len = reference.length();
  - - int bad = len.lenght(); // Doesn’t compile

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Logical - boolean

- Literals:
  - - true
  - - false
- Examples:
  - - boolean cont = true;
  - - boolean exists = false;

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Textual - char

- Literals are enclosed in single quotes (‘’)
- Examples:
  - - ‘a’ - the letter a
  - - ’\t’ - the TAB character
  - - ’\u0041’ - a specific Unicode character A

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Integral – byte, short, int, long

- Use three forms:
  - - Decimal: 67
  - - Octal: 0103
  - - Hexadeciaml: 0x43
- Default type of literal is int.
- Literals with the L or l suffix are of type long

Floating – float, double

- Default type of literal is double
- Literals with the f or F suffix are of type float
- Exponential notation
  - - 3.41E20 = 3.41 x 10^{20}

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Sizes of Data Typ

Data Type	Size
byte	1 byte
short	2 bytes
int	4 bytes
long	8 bytes
float	4 bytes
double	8 bytes
boolean	1 bit
char	2 bytes

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Numeric Promotion Rules

- Different types → larger type
- int + float → float
- short + short → int

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Casting in Java

- **Widening Casting** (automatically) - converting a smaller type to a larger type size:
- byte → short → char → int → long → float → double

- **Narrowing Casting** (manually) - converting a larger type to a smaller size type:
- double → float → long → int → char → short → byte

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String Types

- **String**
- - **Immutable** – once created can not be changed
- - Objects are stored in the **Constant String Pool**
- **StringBuffer**
- - **Mutable** – one can change the value of the object
- - **Thread-safe**
- **StringBuilder**
- - The same as StringBuffer
- - **Not thread-safe**

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Concatenation

- **Rules**
  - number + number = number
  - number + String = String
  - number + number + String = number + String
- **Examples**
  - String name1 = “Fluffy”; // String Pool
  - String name2 = new String(“Fluffy”);

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String Methods

- String str = “Animals”
- str.length();
- str.charAt(1);
- str.charAt(7);
- str.indexOf(‘n’);
- str.substring(3);
- str.toLowerCase();
- str.toUpperCase();
- str.equals(“animals”);
- str.equalsIgnoreCase(“animals”);

str.startsWith(“a”);
str.endsWith(“als”);
str.contains(“ls”);
str.replace(‘s’, ‘o’);
str.trim();

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StringBuilder

- StringBuilder sb1 = new StringBuilder();
- StringBuilder sb2 = new StringBuilder(“animal”);
- StringBuilder sb3 = new StringBuilder(10);

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StringBuilder methods

```
StringBuilder sb = new StringBuilder(“animal”);

StringBuilder sub = sb.substring(sb.indexOf(“a”), sb.indexOf(“al”));

int len = sb.length();

char ch = sb.charAt(6);

StringBuilder sb = new StringBuilder(“animals”);

sb.insert(4, “-”);
```

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StringBuilder methods

```
StringBuilder sb0 = new StringBuilder().append(1);
sb0.append("-").append(true);
sb0.delete(1, 3);
sb0.deleteCharAt(4);

StringBuilder sb = new StringBuilder("animal");
sb.reverse();
String str = sb.toString();
```

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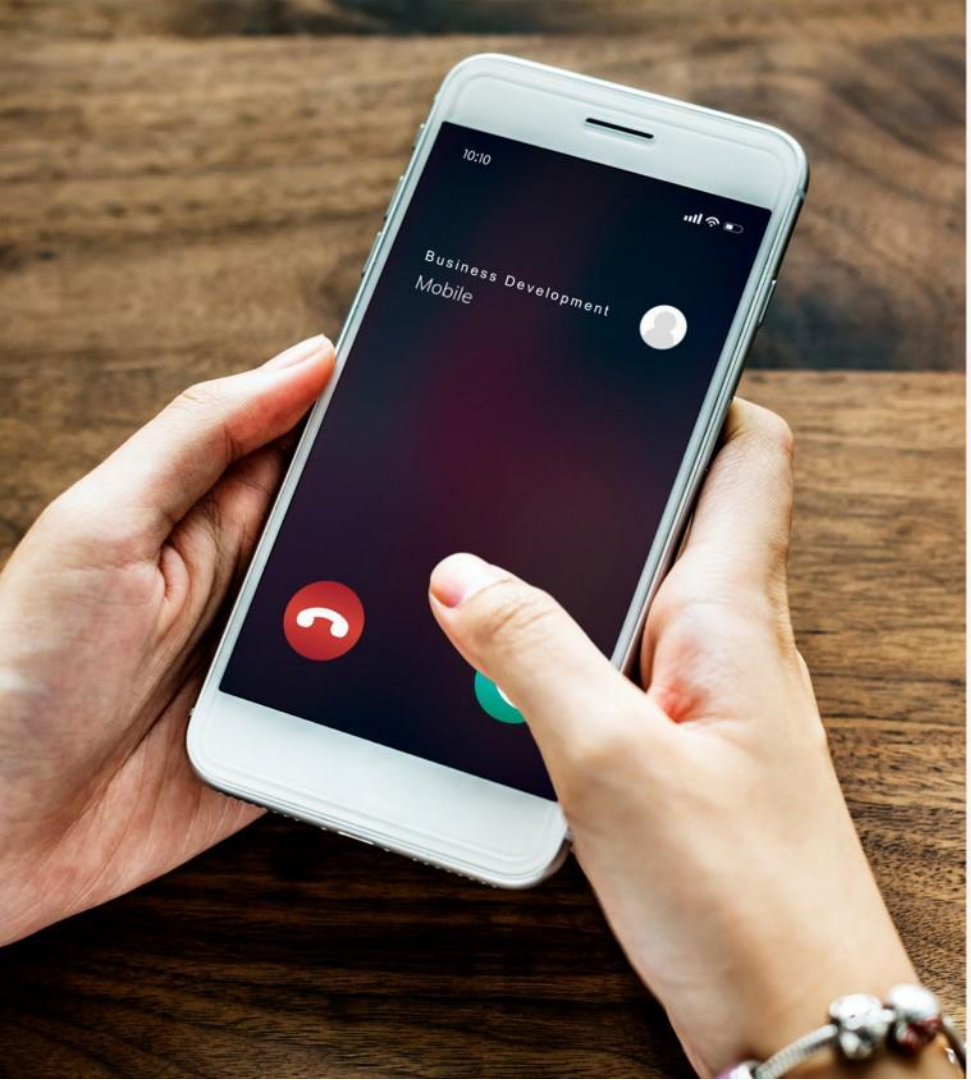
StringBuilder vs String

```
StringBuilder one = new StringBuilder();
StringBuilder two = new StringBuilder();
StringBuilder three = one.append(“ ”);
one == two
one == three
String x = “Hello World”;
String y = “Hello World”;
String z = “Hello World ”.trim();
x == y
x == z
x.equals(z)
```



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