



Mobile Application Development

Produced by Dave Drohan (david.drohan@setu.ie)

Department of Computing & Mathematics
South East Technological University
Waterford, Ireland

Updated & Delivered by Gongzhe Qiao (003969@nuist.edu.cn)

Department of Computer Science
Nanjing University of Information Science and Technology
Nanjing, China

nuist.edu.cn



setu.ie



Introducing Kotlin Syntax - Part 1.1



Agenda

- ❑ Basic Types
- ❑ Local Variables (`val` & `var`)
- ❑ Functions
- ❑ Control Flow (`if`, `when`, `for`, `while`)
- ❑ Strings & String Templates
- ❑ Ranges (and the *`in`* operator)
- ❑ Type Checks & Casts
- ❑ Null Safety
- ❑ Comments



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Basic Types

Numbers, Characters & Booleans



Basic Types

*In Kotlin, **everything** is an **object** in the sense that we can call member functions and properties on **any** variable.*



Basic Types – Numbers

Type	Bit width
Double	64
Float	32
Long	64
Int	32
Short	16
Byte	8

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```
val doubleNumber: Double = 100.45
val floatNumber: Float = 100.45f
val longNumber: Long = 100L
val intNumber: Int = 100
val shortNumber: Short = 100
val byteNumber: Byte = 100
```



Explicitly defining
a numeric type

Basic Types – Numbers

Type	Bit width
Double	64
Float	32
Long	64
Int	32
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Byte	8

```
val doubleNumber = 100.45
val floatNumber = 100.45f
val longNumber = 100L
val intNumber = 100
val shortNumber = 100
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```



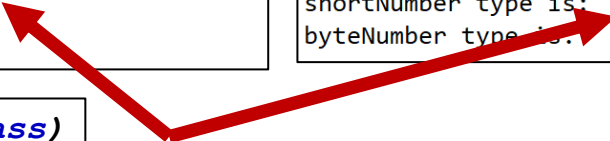
Type Inference

Basic Types – Numbers

Type Inference

```
val doubleNumber = 100.45
val floatNumber = 100.45f
val longNumber = 100L
val intNumber = 100
val shortNumber = 100
val byteNumber = 100
```

```
println("doubleNumber type is: " + doubleNumber.javaClass)
println("floatNumber type is: " + floatNumber.javaClass)
println("longNumber type is: " + longNumber.javaClass)
println("intNumber type is: " + intNumber.javaClass)
println("shortNumber type is: " + shortNumber.javaClass)
println("byteNumber type is: " + byteNumber.javaClass)
```



```
Console
<terminated> Config - Main.kt [Java Appl
doubleNumber type is: double
floatNumber type is: float
longNumber type is: long
intNumber type is: int
shortNumber type is: int
byteNumber type is: int
```

Basic Types – Numbers

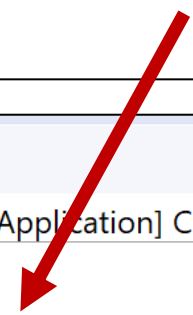
```
val oneMillion = 1_000_000
val threeThousand = 3_000
val creditCardNumber = 1234_4321_5678_8765

fun main(args : Array<String>)
{
    println(" " + oneMillion + " - the type is: " + oneMillion.javaClass)
    println(" " + threeThousand + " - the type is: " + threeThousand.javaClass)
    println(" " + creditCardNumber + " - the type is: " +
creditCardNumber.javaClass)
}
```

You can use
underscores to
make number
constants more
readable.

Console ✕

<terminated> Config - Main.kt [Java Application] C:\Progra
1000000 - the type is: int
3000 - the type is: int
1234432156788765 - the type is: long



Basic Types – Numbers: Explicit Conversions

❑ In Kotlin, there are no implicit widening conversions for numbers i.e. smaller types (e.g. Byte) are not subtypes of bigger ones (e.g. Int)

→ smaller types are NOT implicitly converted to bigger types.

Basic Types – Numbers: Explicit Conversions

- ❑ In Kotlin, there are no implicit widening conversions for numbers i.e. smaller types (e.g. Byte) are not subtypes of bigger ones (e.g. Int)

→ smaller types are NOT implicitly converted to bigger types.

```
val byteNumber: Byte = 10           //static type check: OK
val intNumber: Int = byteNumber     //syntax error
```

BUT, we can use explicit conversions to widen numbers

```
val byteNumber: Byte = 10           //static type check: OK
val intNumber: Int = byteNumber.toInt() //OK
```

Basic Types – Numbers: Explicit Conversions

Every number type supports the following conversions:

- `toByte(): Byte`
- `toShort(): Short`
- `toInt(): Int`
- `toLong(): Long`
- `toFloat(): Float`
- `toDouble(): Double`
- `toChar(): Char`

```
//Explicit Conversion
```



```
val intNumber: Int = byteNumber.toInt()
```

```
val floatNumber: Float = byteNumber.toFloat()
```

Basic Types – Characters

```
val aChar = 'a'
val bChar: Char = 'b'

fun main(args : Array<String>)
{
    println("'" + aChar + "' - the type is: " + aChar.javaClass)
    println("'" + bChar + "' - the type is: " + bChar.javaClass)
}
```

 Console 

<terminated> Config - Main.kt [Java Application] C:\Program Files\Java\jre1.8.0


a - the type is: char

b - the type is: char

Basic Types – Booleans

```
val aFlag = true
val bFlag: Boolean = false

fun main(args : Array<String>)
{
    println(" " + aFlag + " - the type is: " + aFlag.javaClass)
    println(" " + bFlag + " - the type is: " + bFlag.javaClass)
}
```

 Console ✕

```
<terminated> Config - Main.kt [Java Application] C:\Program Files\Java\jre1.8.0_77\bin\
true - the type is: boolean
false - the type is: boolean
```




Basic Types – Escape Characters

Special characters can be escaped using a backslash:

`\t` `\b` `\n` `\r` `\'` `\"` `\\` `\$`

```
val aFlag= true
val bFlag: Boolean = false

fun main(args : Array<String>) {
    println("'" + aFlag + "' - the type is: \n\t\t" + aFlag.javaClass)
    println("'" + bFlag + "' - the type is: \n\t\t" + bFlag.javaClass)
}
```

 Console 

<terminated> Config - Main.kt [Java Application] C:\Program Files\Java\jre1.8.0

```
true - the type is:
        boolean
false - the type is:
        boolean
```

Local Variables

`val` (read-only) and `var` (mutable)



Local Variables – **val** (read-only)

- ❑ Defined using the keyword **val**. They can be assigned a value only once.

```
1 fun main() {  
2     val a: Int = 1 // immediate assignment  
3     val b = 2     // `Int` type is inferred  
4     val c: Int    // Type required when no initializer is provided  
5     c = 3         // deferred assignment  
6     println("a = $a, b = $b, c = $c")  
7 }
```

a = 1, b = 2, c = 3

Local Variables – **val** (read-only)

- ❑ Defined using the keyword **val**. They can be assigned a value only once.

```
1 fun main() {  
2     val a: Int = 1 // immediate assignment  
3     val b = 2     // `Int` type is inferred  
4     val c: Int    // Type required when no initializer is provided  
5     c = 3         // deferred assignment  
6     c = 4  
7     println("a = $a, b = $b, c = $c")  
8 }
```


! Val cannot be reassigned

Local Variables – **var** (mutable)

- Variables that can be reassigned use the **var** keyword:

```
1 fun main() {  
2     var x = 5 // `Int` type is inferred  
3     x += 1  
4     println("x = $x")  
5 }
```

x = 6



Local Variables – var (mutable)

- Variables that can be reassigned use the **var** keyword:

```
1 fun main() {  
2     var x = 5 // `Int` type is inferred  
3     x += 1  
4     x = 10  
5     println("x = $x")  
6 }
```

x = 10



References

Sources: <http://kotlinlang.org/docs/reference/basic-syntax.html>
<http://petersommerhoff.com/dev/kotlin/kotlin-for-java-devs/>
<https://www.programiz.com/kotlin-programming>
<https://medium.com/@napperley/kotlin-tutorial-5-basic-collections-3f114996692b>

