



JÖNKÖPING UNIVERSITY

School of Engineering

KOTLIN

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Spring 2021

DATATYPES

- Same basic datatypes as in Java.

Datatype	Size	Min value	Max value
byte	8 bits	-128	127
short	16 bits	-32 768	32 767
int	32 bits	-2 147 483 648	2 147 483 647
long	64 bits	-2^{63}	$2^{63}-1$
float	32 bits		
double	64 bits		
char	16 bits		
boolean			

VARIABLES

- In Java, global variables do not exist.
 - Use class variables instead (static instance variables).
- In Kotlin, global variables do exist.

```
val theNumber: Int = 12
```

```
val theNumber = 12
```

```
var theNumber: Int = 12  
theNumber = 44
```

```
var theNumber = 12  
theNumber = 44
```

VARIABLES

- In Java, we can use **null**.
- In Kotlin, we avoid using **null**.

```
Dog myDog = null;
```

```
var myDog: Dog = null
```

```
var myDog: Dog? = null
```

```
var myDog = null
```



Nothing?

VARIABLES

- In Java, we can use **null**.
- In Kotlin, we avoid using **null**.

```
Dog myDog = null;  
// ...  
myDog.bark();  
if (myDog != null) {  
    myDog.bark();  
}
```

```
var myDog: Dog? = null  
// ...  
myDog.bark()  
myDog?.bark()  
myDog!!.bark()  
val theDog: Dog = !!myDog  
if (myDog != null) {  
    myDog.bark()  
}
```

EXPRESSIONS INSTEAD OF STATEMENTS

- Many things can be written as expressions in Kotlin.
 - Especially useful to avoid using **null**.

```
int dayIndex = 1;
String dayName = null;
if(dayIndex == 0) {
    dayName = "Sunday";
} else if(dayIndex == 1) {
    dayName = "Monday";
} else if(dayIndex == 2) {
    // And so on...
}
```

```
val dayIndex = 1;
val dayName = if(dayIndex == 0) {
    "Sunday"
} else if(dayIndex == 1) {
    "Monday"
} else if(dayIndex == 2) {
    // And so on...
}
```

EXPRESSIONS INSTEAD OF STATEMENTS

- Many things can be written as expressions in Kotlin.
 - Especially useful to avoid using **null**.

```
int dayIndex = 1;
String dayName = null;
switch (dayIndex) {
    case 0:
        dayName = "Sunday";
        break;
    case 1:
        dayName = "Monday";
        break;
    // And so on...
}
```

```
val dayIndex = 3;
val dayName = when (dayIndex) {
    0 -> "Sunday"
    1 -> "Monday"
    // And so on...
    else -> "Unknown"
}
```


FUNCTIONS

- In Java, global functions do not exist.
 - Use class functions instead (static instance methods).
- In Kotlin, global functions do exist.

```
fun isPositive(x: Int): Boolean {  
    return 0 <= x  
}
```

```
fun isPositive(x: Int = 5): Boolean {  
    return 0 <= x  
}
```

FUNCTIONS

- In Java, global functions do not exist.
 - Use class functions instead (static instance methods).
- In Kotlin, global functions do exist.

```
fun isPositive(x: Int): Boolean {  
    return 0 <= x  
}
```

```
fun isPositive(x: Int) = 0 <= x
```

FUNCTIONS

- In Java, global functions do not exist.
 - Use class functions instead (static instance methods).
- In Kotlin, global functions do exist.

```
fun printTwice(text: String): Unit {  
    print(text); print(text)  
}
```

NESTED FUNCTIONS

- A function can access variables created in the scopes surrounding the function.

```
var counter = 0
fun incCounter(): Int {
    counter += 1
    return counter
}
print(incCounter()) // 1
print(incCounter()) // 2
```

NESTED FUNCTIONS

- Functions are values that can be tossed around, e.g. returned.

```
fun createCounter(): () -> Int {  
    var counter = 0  
    fun incCounter(): Int {  
        counter += 1  
        return counter  
    }  
    return ::incCounter  
}
```

```
val incCounterA = createCounter()  
val incCounterB = createCounter()  
print(incCounterA()) // 1  
print(incCounterB()) // 1
```

NESTED FUNCTIONS

- Functions are values that can be tossed around, e.g. passed to a fun.

```
fun areBoth(a: Int, b: Int, test: (Int) -> Boolean): Boolean {  
    return test(a) && test(b)  
}  
  
fun isOdd(x: Int) = x % 2 == 1  
val areBothOdd = areBoth(3, 5, ::isOdd)
```

NESTED FUNCTIONS

- Functions are values that can be tossed around, e.g. passed to a fun.

```
fun areBoth(a: Int, b: Int, test: (Int) -> Boolean): Boolean {  
    return test(a) && test(b)  
}  
val areBothOdd = areBoth(3, 5, fun (x: Int) = x % 2 == 1)
```

NESTED FUNCTIONS

- Functions are values that can be tossed around, e.g. passed to a fun.

```
fun areBoth(a: Int, b: Int, test: (Int) -> Boolean): Boolean {  
    return test(a) && test(b)  
}  
val areBothOdd = areBoth(3, 5, { x -> x % 2 == 1})
```


NESTED FUNCTIONS

- Functions are values that can be tossed around, e.g. passed to a fun.

```
fun areBoth(a: Int, b: Int, test: (Int) -> Boolean): Boolean {  
    return test(a) && test(b)  
}
```

```
val areBothOdd = areBoth(3, 5, { it % 2 == 1 })
```

NESTED FUNCTIONS

- Functions are values that can be tossed around, e.g. passed to a fun.

```
fun areBoth(a: Int, b: Int, test: (Int) -> Boolean): Boolean {  
    return test(a) && test(b)  
}  
val areBothOdd = areBoth(3, 5) {  
    it % 2 == 1  
}
```

NESTED FUNCTIONS

- Functions are values that can be tossed around, e.g. passed to a fun.

```
fun callTwice(theFunction: () -> Unit): Unit {  
    theFunction()  
    theFunction()  
}  
callTwice() {  
    print("Hi!")  
}  
callTwice {  
    print("Hi!")  
}
```

THE SPECIAL LET & RUN FUNCTION

```
val fileManager = FileManager()  
fileManager.deleteFile("data.txt")  
fileManager.deleteFile("secrets.txt")
```

```
FileManager().let {  
    it.deleteFile("data.txt")  
    it.deleteFile("secrets.txt")  
}
```

```
FileManager().run {  
    deleteFile("data.txt")  
    deleteFile("data.txt")  
}
```

THE SPECIAL LET & RUN FUNCTION

```
val fileManager = FileManager()  
val wasDeleted = fileManager.deleteFile("data.txt")
```

```
val wasDeleted = FileManager().let {  
    it.deleteFile("data.txt")  
}
```

```
val wasDeleted = FileManager().run {  
    deleteFile("data.txt")  
}
```

THE SPECIAL ALSO & APPLY FUNCTION

```
val fileManager = FileManager()
fileManager.deleteFile("data.txt")
```

```
val fileManager = FileManager().also {
    it.deleteFile("data.txt")
}
```

```
val fileManager = FileManager().apply {
    deleteFile("data.txt")
}
```

DATA CLASSES

```
data class Human(val name: String, val age: Int)
```

- Compiler generates:
 - equals()
 - hashCode()
 - toString()
 - copy()

CLASSES

```
class Human(val name: String, val age: Int) {  
    val city = "Jönköping"  
    fun getPresentation() = "Hi! My name is $name."  
}
```


INHERITANCE

```
open class Human(val name: String, val age: Int) {  
    val city = "Jönköping"  
    open fun getPresentation() = "Hi! My name is $name."  
}
```

```
class Superman : Human("Superman", 26) {  
    override fun getPresentation() = "I'm ${name.toUpperCase()}!"  
}
```