

### Simple Values

let for constants; var for variables

Constants: value doesn't need to be known at compile time, but must assign it a value exactly once

Rule for types: constant or variable must have the same type as the value you want to assign it.

Inferring Types: Type can be inferred if value provided when creating constant/var.

Specifying types: Write after the variable, separated by colon

```
let explicitDouble: Double = 70
```

Values are never implicitly converted to another type. If conversion required, must be done explicitly

```
let lottoString = "Today's winning lotto number is "
let lottoNumber = 94
let lottoSentence = lottoString + String(lottoNumber)
```

### Backslash string interpolation

```
let friendCount = 2
let friendCountString = "I have \(friendCount) number of friends."
```

Use three double quotation marks for strings that take up multiple lines.

Create arrays and dictionaries using brackets, and access their elements by writing the index or key in brackets.

### Simple Values (cont)

```
var toys = ["laubub", "simski", "furby"]
toys[1] = "fugler"
toys.append("jellycat")
var bestItemOfThing = ["summer fruit": "mango"]
bestItemOfThing["summer fruit"] = "peach"
```

Arrays grow automatically.

For empty array, write `emptyArray = []`. For an empty dictionary, write `emptyDictionary = [:]`.

If assigning empty array or dict to new var, you need to specify type.

```
let arrayOfGoodCoffee: [String] = []
let dictionaryWithMachines: [String: Int] = [:]
```

### Control Flow

**Conditionals:** if, switch

**Loops:** for-in, while, repeat - while

Parentheses around condition/loop variable are optional, braces are required

```
let croissantScores = [1.2, 2.3, 2.2, 4]
for score in croissantScores {
    if score > 2.5 {
        print("Great croissant!")
    }
}
```

In if statement, conditional must be a boolean expression. `if score { ... }` is an error, not implicit comparison to zero.

You can assign if conditions to an assignment

```
let scoreDeduction = if teamScore > 10 {
    " "
} else {
    " "
}
print("Score: ", teamScore, scoreDeduction)
```

### Control Flow (cont)

**Optionals:** either contains a value or contains `nil` to indicate a value is missing.

A question mark after type of value marks it as optional.

```
var optionalString: String? = "Hello!"
print(optionalString == nil)
// prints "false"
```

Use `if` and `let` to work with missing values. If optional value is `nil`, conditional is false and code in braces is skipped. Otherwise, optional value is unwrapped and assigned to constant after `let`, which makes the unwrapped value available inside block of code.

```
var optionalName: String? = "Big Dog"
var greeting = "Hello!"
if let name = optionalName {
    greeting = "Hello, \(name)!"
} else {
    greeting = "Wow!"
}
```

**?? operator:** If optional value missing, default value used instead

```
let holidayInNov: String? = nil
let holidayInDec: String = "Bali"
let welcomeMsg = "Enjoy \(holidayInNov ?? holidayInDec)"
```

**Switches:** support any kind of data and variety of comparisons

After executing the code inside the switch case that matched, program exits from the switch statement. Execution doesn't continue to the next case, so you don't need to explicitly break out of the switch at the end of each case's code.

### Control Flow (cont)

```
perfume = "Eau Rose"

switch perfume {
case "Elderberry Cherry":
    print("Jasmine sambac, ambrette musk")
case "On a Date", "Born In Roma":
    print("These have a black currant note.")
case let x where x.hasSuffix("rose"):
    print("Is it a fragrance with \(x)?")
default:
    print("A delicious choice.")
}

// Prints "Is it a fragrance with rose?"
```

**for-in:** Use to iterate over items in a dict by providing pair of names for key-value pair.

```
let interestingNumbers = [
    "country codes from my holidays": [66, 1, 86, 8],
    "cricket players": [49, 56, 26, 30],
]

var largest = 0
for (_, numbers) in interestingNumbers {
    for number in numbers {
        if number > largest {
            largest = number
        }
    }
}
```

**while:** condition can be at end too, to ensure loop runs at least once

```
var croissantLeft = 2
while croissantLeft < 100 {
    croissantLeft *= 2
}

print(croissantLeft)
// prints "128"
```

```
var cakesLeft = 2
repeat {
    cakesLeft *= 2
} while cakesLeft < 0
print(cakesLeft)
```

**Keep an index in a loop:** Use `...` for a range that includes both values for range that omits upper val

### Control Flow (cont)

```
var total = 0
for i in 0...4 {
    total += i
}
print( total)
// Prints " 10"
```

### Functions and Closures

**functions:** Use `func` to declare a function. Call a function by following its name with a list of arguments in parentheses. Use `->` to separate the param names and types from the function's return type

```
func greet (greeting: String, country: String)
-> String {
    return " \(greeting), welcome to \(country)."
}
greet( greeting: " Namaste", country: " Nepal")
```

By default, functions use their param names as labels for their arguments. You can write a custom arg label before the param name, or write `_` to use no argument label.

```
func thank(_ person: String, for action: String)
-> String {
    return " Thank you \(person), for \(action)."
}
thank( " Dil lingsb y", for: " scooping up the poo")
```

**Use tuples for compound values:** e.g. to return multiple values from a func. The elements of a tuple can be referred to either by name or number.

### Functions and Closures (cont)

```
func doMath (scores: [Int])
-> (min: Int, max: Int, sum: Int) {
    var min = scores[0]
    var max = scores[0]
    var sum = 0

    for score in scores {
        if score > max {
            max = score
        } else if score < min {
            min = score
        }
        sum += score
    }

    return (min, max, sum)
}

let results = doMath (scores: [5, 3, 100, 3, 9])
print( results.sum)
// prints " 120 "
print( results.1)
// prints " 100 "
```

**Nested functions:** Functions can be nested. Nested functions have access to variables declared in outer function.

**Closures:** A function can take another func as one of its arguments, and can also return another func as its value.

```
func hasAnyMatches(list: [Int],
condition: (Int) -> Bool) -> Bool {
    for item in list {
        if condition (item) {
            return true
        }
    }
    return false
}

func lessThanTen( number: Int) -> Bool {
    return number < 10
}

var numbers = [20, 19, 7, 12]
hasAnyMatches(list: numbers, condition: lessThanTen)
```