



Go Piscine

Go 02

*Summary: THIS document is the subject for the Go 02 module of the Go Piscine @ 42Tokyo.*

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# Chapter I


## Instructions

- Only this page will serve as reference; do not trust rumors.
- Watch out! This document could potentially change up to an hour before submission.
- These exercises are carefully laid out by order of difficulty - from easiest to hardest. We will not take into account a successfully completed harder exercise if an easier one is not perfectly functional.
- Make sure you have the appropriate permissions on your files and directories.
- You have to follow the submission procedures for every exercise.
- Your exercises will be checked and graded by your fellow classmates.
- You cannot leave any additional file in your directory than those specified in the subject.
- Got a question? Ask your peer on the right. Otherwise, try your peer on the left.
- Your reference guide is called `Google / man / the Internet / ....`
- Examine the examples thoroughly. They could very well call for details that are not explicitly mentioned in the subject...
- If no other explicit information is displayed, you must use the latest versions of Go.
- Your turn-in directory for each exercise should look something like this:

```
ex[XX]
|-- main.go
|-- vendor
|   |-- ft
|       |-- printrune.go
|-- piscine
|   |-- [exercisename].go
```

# Chapter II

## Exercise 00 : iterativefactorial

	Exercise 00
iterativefactorial	
Turn-in directory : <i>ex00/</i>	
Files to turn in : *	
Allowed packages : <b>fmt</b>	
Allowed builtin functions : <b>None</b>	

Write an iterative function that returns the factorial of the int passed as parameter.

- Errors (non possible values or overflows) will return 0.
- Expected function

```
func IterativeFactorial(nb int) int {  
}
```

- Usage


```
package main  
  
import (  
    "fmt"  
    "piscine"  
)  
  
func main() {  
    arg := 4  
    fmt.Println(piscine.IterativeFactorial(arg))  
}
```

- Output of usage

```
$ go mod init ex00  
$ go run .  
24  
$
```

# Chapter III

## Exercise 01 : recursivefactorial

	Exercise 01
recursivefactorial	
Turn-in directory : <i>ex01/</i>	
Files to turn in : *	
Allowed packages : <b>fmt</b>	
Allowed builtin functions : <b>None</b>	

Write a recursive function that returns the factorial of the int passed as parameter.

- Errors (non possible values or overflows) will return 0.
- **for** is forbidden for this exercise.
- Expected function

```
func RecursiveFactorial(nb int) int {  
}
```

- Usage


```
package main  
  
import (  
    "fmt"  
    "piscine"  
)  
  
func main() {  
    arg := 4  
    fmt.Println(piscine.RecursiveFactorial(arg))  
}
```

- Output of usage

```
$ go mod init ex01
$ go run .
24
$
```

# Chapter IV

## Exercice 02 : iterativepower

	Exercise 02
	iterativepower
	Turn-in directory : <i>ex02/</i>
	Files to turn in : *
	Allowed packages : <b>fmt</b>
	Allowed builtin functions : <b>None</b>

Write an iterative function that returns the value of nb to the power of power.

- Negative powers will return 0. Overflows do not have to be dealt with.
- Expected function

```
func IterativePower(nb int, power int) int {  
}
```

- Usage


```
package main  
  
import (  
    "fmt"  
    "piscine"  
)  
  
func main() {  
    fmt.Println(piscine.IterativePower(4, 3))  
}
```

- Output of usage

```
$ go mod init ex02  
$ go run .  
64  
$
```

# Chapter V

## Exercice 03 : recursivepower

	Exercise 03
	recursivepower
	Turn-in directory : <i>ex03/</i>
	Files to turn in : *
	Allowed packages : <b>fmt</b>
	Allowed builtin functions : <b>None</b>

Write an iterative function that returns the value of nb to the power of power.

- Negative powers will return 0. Overflows do not have to be dealt with.
- `for` is forbidden for this exercise.
- Expected function

```
func RecursivePower(nb int, power int) int {  
}
```

- Usage

```
package main  
  
import (  
    "fmt"  
    "piscine"  
)  
  
func main() {  
    fmt.Println(piscine.RecursivePower(4, 3))  
}
```


- Output of usage



```
$ go mod init ex03
$ go run .
64
$
```

# Chapter VI

## Exercise 04 : fibonacci

	Exercise 04
fibonacci	
Turn-in directory : <i>ex04/</i>	
Files to turn in : *	
Allowed packages : <b>fmt</b>	
Allowed builtin functions : <b>None</b>	

Write a recursive function that returns the value at the position index in the fibonacci sequence.

- The first value is at index 0.
- The sequence starts this way: 0, 1, 1, 2, 3 etc...
- A negative index will return -1.
- **for** is forbidden for this exercise.
- Expected function

```
func Fibonacci(index int) int {  
}
```

- Usage

```
package main

import (
    "fmt"
    "piscine"
)


func main() {
    arg1 := 4
    fmt.Println(piscine.Fibonacci(arg1))
}
```

- Output of usage

```
$ go mod init ex04
$ go run .
3
$
```

# Chapter VII

## Exercise 05 : sqrt

	Exercise 05
sqrt	
Turn-in directory : <i>ex05/</i>	
Files to turn in : *	
Allowed packages : <b>fmt</b>	
Allowed builtin functions : <b>None</b>	

Write a function that returns the square root of the int passed as parameter, if that square root is a whole number. Otherwise it returns 0.

- Expected function

```
func Sqrt(nb int) int {  
}
```

- Usage


```
package main  
  
import (  
    "fmt"  
    "piscine"  
)  
  
func main() {  
    fmt.Println(piscine.Sqrt(4))  
    fmt.Println(piscine.Sqrt(3))  
}
```

- Output of usage

```
$ go mod init ex05  
$ go run .  
2  
0  
$
```

# Chapter VIII

## Exercise 06 : isprime

	Exercise 06
isprime	
Turn-in directory : <i>ex06/</i>	
Files to turn in : *	
Allowed packages : <b>fmt</b>	
Allowed builtin functions : <b>None</b>	

Write a function that returns true if the int passed as parameter is a prime number. Otherwise it returns false.

- The function must be optimized in order to avoid time-outs with the tester.
- (We consider that only positive numbers can be prime numbers)
- (We also consider that 1 is not a prime number)
- Expected function

```
func IsPrime(nb int) bool {  
}
```

- Usage


```
package main  
  
import (  
    "fmt"  
    "piscine"  
)  
  
func main() {  
    fmt.Println(piscine.IsPrime(5))  
    fmt.Println(piscine.IsPrime(4))  
}
```

- Output of usage

```
$ go mod init ex06
$ go run .
true
false
$
```

# Chapter IX

## Exercise 07 : findnextprime

	Exercise 07
	findnextprime
	Turn-in directory : <i>ex07/</i>
	Files to turn in : *
	Allowed packages : <b>fmt</b>
	Allowed builtin functions : <b>None</b>

Write a function that returns the first prime number that is equal or superior to the int passed as parameter.

- The function must be optimized in order to avoid time-outs with the tester.
- (We consider that only positive numbers can be prime numbers)
- Expected function

```
func FindNextPrime(nb int) int {  
}
```

- Usage

```
package main  
  
import (  
    "fmt"  
    "piscine"  
)  
  
func main() {  
    fmt.Println(piscine.FindNextPrime(5))  
    fmt.Println(piscine.FindNextPrime(4))  
}
```


- Output of usage

```
$ go mod init ex07
$ go run .
5
5
5
$
```



# Chapter X

## Exercise 08 : eightqueens

	Exercise 08
eightqueens	
Turn-in directory : <i>ex08/</i>	
Files to turn in : *	
Allowed packages : <b>None</b>	
Allowed builtin functions : <b>None</b>	

Write a function that prints the solutions to the eight queens puzzle.

- Recursivity must be used to solve this problem.
- Your function should print something like this:

```
$ go mod init ex08
$ go run .
15863724
16837425
17468253
...
$
```

- Expected function

```
func EightQueens() {
}
```