

# VG101 — Introduction to Computer and Programming

## Worksheet (chapter 6)

Manuel — UM-JI (Fall 2018)

### Worksheet concept

- Simple exercises based on the slides
- Optional personal work
- No submission, no grading
- Only refer to websites in English

#### Ex. 1 — Slide questions

Ensure you can answer all the questions appearing in chapter 6.

#### Ex. 2 — 2-complement

1. Write an algorithm that prompt the user for an integer and returns its 2-complement.
2. Implement the previous algorithm in C.

#### Ex. 3 — Reading

Search and read on how double and float are encoded in the memory. Based on that recover the ranges provided on slide 8.6.

#### Ex. 4 — Structure

1. Define a structure that contains the chapter number, the title of the chapter, and the number of slides in this chapter.
2. Return the title of the longest and shortest chapters in the course as well as how many slides compose each of them.
3. Write several structures to define the following shapes: triangle, rectangle, square, and circle.

#### Ex. 5 — Data types

Write a short program where you add

1. A float and a double into an int ;
2. An int and a double into a float;
3. Two int into an unsigned char;

#### Ex. 6 — Conditional statements and loops

Write a C program where the computer selects a random number  $r$  less than some user defined bound. When the user inputs its guess the program answers “larger”, “smaller” or “win”, depending whether the number input by the user is smaller, larger or equal to  $r$ . The program ends when the user wins.

#### Ex. 7 — Loops

On a user input of 10 marks, calculate the mean, the median, the variance, and the standard deviation. Each calculation should be done in a separate function.

#### Ex. 8 — ASCII code, loops, and conditional statements

Write a program that prompts the user for a task. Call the tasks 1, 2, or 3, where

1. means ask the user for a character and displays its ASCII code;
2. means display the ASCII code of all the characters;
3. means display all the characters whose ASCII code is divisible by 3;