ECAM
BRUSSELS ENGINEERING SCHOOL

Fall 2019
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E301B C Programming

Quizz 1: Number representation

This assessment evaluates the following competencies:

- *CP201 – understand how to talk about information quantities and use the correct units*
- *CP202 – understand the positional notation and write and convert a number between different bases*
- *CP203 – understand and compare different ways to represent integer*
- *CP206 – understand how implicit and explicit conversion are performed between data types*
- *CP301 – deal with the eight basic data types and choose the most adapted one to store a given data*
- *CP204 – write an integer and perform fundamental arithmetic operation with two's complement*

Three affirmations are given for the five first assessed competency. For each of them, you have to decide whether it is true or false. To get a star for the competency, you must have the correct answer for the three affirmations.

CP201	**True**	**False**
One kilobyte is equivalent to 8000 bits.	☐	☐
One kibibyte is equivalent to 8000 bits.	☐	☐
Ten kbps is equivalent to 8000 bits per second.	☐	☐

CP202	**True**	**False**
There are six digits (0 to 5) that can be used to write a number with base 5.	☐	☐
$(1101)_2 = (13)_{10}$	☐	☐
$(1011)_2 = (A0)_{16}$	☐	☐

CP203	**True**	**False**
With 3 bits, it is possible to represent 8 different distinct integers with the sign bit notation.	☐	☐
With 4 bits, the integer $(3)_{10}$ is written 100 with the ones' complement notation.	☐	☐
The 1100 bit sequence of length 4 represents a negative integer with the two's complement notation.	☐	☐

CP206	**True**	**False**
It is always possible to convert a value stored as a `short` to a `long int` without any information or precision loss.	☐	☐
Converting a `float` to an `int` can be done implicitly.	☐	☐
When performing an explicit conversion with the cast operator of an integer value, it is possible that its sign changes.	☐	☐

CP301	**True**	**False**
The `char` data type can be used to store strings (sequence of characters).	☐	☐
To store the number of countries in the world, it is okay to use a `short int`.	☐	☐
To store the height of a person in meters, it is okay to use a `short int`.	☐	☐

For the last assessed competency (CP204), you have to write the two following number on 6 bits, using two's complement, and then perform their addition : 14 and 7.