CT101: Assignment 1 – Numbering Systems

This assignment will involve using the lab time to carry out research and develop **your own** examples for the various conversions and arithmetic examples that we covered in class. You should detail **all** the steps in each case as if it was being taught to a student for this first time. You can base your examples on online sources (provide references) or the lecture notes but you must use *different* numbers for the examples that you choose yourself.

Your report should include the following content:

- Using an example with a six-digit number, describe what is meant by positional notation
- Outline the differences between the binary, octal and hexadecimal numbering systems
- Convert a four-digit decimal number of your choice to binary
- Convert a ten-digit binary number of your choice to decimal
- Convert a four-digit decimal number of your choice to octal
- Convert a four-digit octal number of your choice to decimal
- Convert a four-digit decimal number of your choice to hexadecimal
- Convert a four-digit hexadecimal number of your choice to decimal
- Convert an eight-digit binary number of your choice to octal
- Convert an eight-digit octal number of your choice to binary
- Show how the addition of two binary numbers works using two eight-bit binary numbers
- Show how the subtraction of two binary numbers works using two eight-bit binary numbers

The report should have appropriate headings, based on the content above, such as “Positional Notation”, “Different Numbering Systems”, “Decimal to Binary Conversion Example”.

You should spend some time trying to find useful and clear examples online (videos/tutorial websites etc.) and then create your own example which clearly outlines **all** the steps taken in each case.

You can create the report using software such as Microsoft Word or Microsoft PowerPoint.

The tutor will be able to help you with sourcing some useful examples and formatting the report but not with verifying the content of the examples themselves.

You have two lab sessions to complete this and you should submit your final report, with the appropriate headings, as a PDF file through Blackboard by **Friday the 22nd of October @ 5pm**.