COMP 10280
Programming I (Conversion)
Practical Sheet 19
Déardaoin, 19 Deireadh Fómhair 2023

For each of the following questions, write an algorithm in pseudocode first before writing a Python program. Submit your algorithms in psuedocode as well as your Python programs.
When writing functions, use one-line or multi-line docstrings, as appropriate, to document your functions.

1. Write a Python function that takes a number in base 10 and a base, both positive `int`s, and, using the algorithm presented in lectures, returns the number in the base supplied.

   Save this program as `p19p1.py`.

2. Write a function that takes a string of digits, representing a number, and a base (an `int`) as arguments, and returns the number in decimal (Base 10). The digits should include the letters A–F (uppercase and lowercase), so that hexadecimal numbers can be supplied and converted.

   Save this program as `p19p2.py`.

3. Write a program that reads a file and checks that brackets (ie `(` and `)`, `<` and `>`, { and } and `[` and `]`) are balanced, ie there should never be a situation where there are more right brackets of a particular type than there are corresponding left brackets and the total number of right brackets should equal the number of left brackets (You do not need to consider the interleaving of different bracket types). Your program should return the total number of each bracket and a message indicating whether or not the file has balanced brackets.

   Save this program as `p19p3.py`.

Please upload your work to the Brightspace site before Sunday evening.

You should keep a copy of your programs for your portfolio.