## FC723 Assignment 3 – Designing Algorithms with Pseudocode

You have been tasked to develop an encryption algorithm that involves relative prime numbers. Relative prime numbers are prime numbers whose greatest common divisor (GCD) is one.

One technique that is used to calculate the GCD of given two positive integers is by using Euclidean Algorithm, see for example:

<https://www.khanacademy.org/computing/computer-science/cryptography/modarithmetic/a/the-euclidean-algorithm>

**Tasks**

1. Design the pseudocode of the Euclidean Algorithm. (5 marks)
2. Convert your pseudocode into a working application that implements the Euclidean Algorithm (*you cannot use Python’s built-in* math *module*). Make sure to make use of encapsulation to make sure your code is reusable. Ensure that you include appropriate explanatory code comments. (5 marks)
3. Create a git repository and commit your application to git. (1 mark)
4. Refactor your code so that your application can accept input numbers via keyboard inputs, using these inputs to implement the Euclidean Algorithm. You should make sure to check for valid input (what numbers will the Euclidean Algorithm accept?) and gives the user an error message if the input is invalid. (4 marks)
5. Commit the new version to your git and discuss, giving reference to git commands, how you will keep track of your commits and the differences between each commit. Include a link to your public git repository for this project. (5 marks)
6. Suggest an extension to the Euclidean Algorithm that increases the functionality of your program. Design the pseudocode of this extension to the Euclidean Algorithm. (5 marks)