

## Computer Science and Programming Homework November 2nd, 2020

### Task 1 *Review–recursion*

Please implement the Euclidean algorithm to find the greatest common divisor of two integers with Python using recursion.

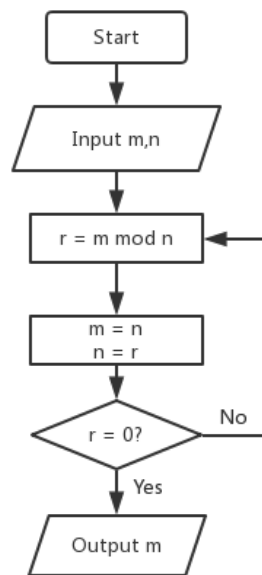


Figure 1: Euclidean algorithm

### Task 2 *Proving Correctness*

Try to prove the correctness of the algorithm that we used to solve the problem of Hanoi tower. Please use the format we talked in the lecture: Initialization, maintenance and termination. (Take a picture of your solution and send it to the email address)

### Task 3 *Analyzing runtime*

Please analyze the time complexity of the algorithm you designed previously to find all prime numbers which are less than  $n$ , and use big O notation to express it. Also, think about it, can you improve this algorithm to make it run in less time? If so, briefly describe the improvement idea and calculate its run time. (Take a picture of your solution and send it to the email address)