CS3130 Homework 1

Phillip Janowski (pajmc2@mail.umsl.edu)

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Question 1.

(a) Find $gcd(213486, 5423)$

213486 / 5243 = 39 R 1989
213486 = 5423 * 39 + 1989
213486 / 1989 = 107 R 663
213486 = 1989 * 107 + 663
213486 / 663 = 332 R 0

$\therefore gcd(213486, 5423) = 663$

(b) Estimate approximately how many times faster it will be to find $gcd(213486, 5423)$ with the help of the Euclid's algorithm compared with the algorithm based on checking consecutive integers from minm, n down to gcd(m, n) (see the algorithm #2 from the handout). You may only count the number of modulus divisions of the largest integer by different divisors.

$min(213486, 5423) = 5423$
$m/t \neq 0$ where $m = 213486$ and $t = 5423$ $t - 1 = 5422$
$m - gcd(213486, 5423) = 4760$ steps
4760 steps /4 steps = 1190 times faster