

## Math 4330, Homework 4, 2/14/2014 : Due 2/19/2014 <sup>1</sup>

Read 4.5.2 up to and including Algorithm A. Then do the following:

1. Write a function `gcd(u,v)` which computes and returns the gcd of two integers using Algorithm A.
2. Determine the average number of times Step A2 is executed when computing the gcd of  $a$  and  $b$ :
  - For all  $a, b$  in the range  $1 \leq a \leq 100, 1 \leq b \leq 100$ ,
  - For all  $a, b$  in the range  $1 \leq a \leq 200, 1 \leq b \leq 200$ ,
  - For all  $a, b$  in the range  $1 \leq a \leq 400, 1 \leq b \leq 400$ ,
  - For all  $a, b$  in the range  $1 \leq a \leq 800, 1 \leq b \leq 800$ ,
  - For all  $a, b$  in the range  $1 \leq a \leq 1600, 1 \leq b \leq 1600$ ,

Make a conjecture about this average in general.

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