ASSIGNMENT 4 GROUP 3

Q.2 GCD of three numbers a, b, c using Stein's Algorithm.

$gcd(a, 0, 0) = a$
$gcd(0, b, 0) = b$
$gcd(0, 0, c) = c$
} Base cases

- If a, b, c all are EVEN

$$gcd(a, b, c) = 2\, gcd(a/2, b/2, c/2)$$

- If a & b – EVEN, c – ODD

$$gcd(a, b, c) = gcd(a/2, b/2, c)$$

b & c – EVEN, a – ODD

$$gcd(a, b, c) = gcd(a, b/2, c/2)$$

c & a – EVEN, b – ODD

$$gcd(a, b, c) = gcd(a/2, b, c/2)$$

- If only one ~~ODD~~ EVEN

a – EVEN ~~ODD~~: $gcd(a, b, c) = gcd(a/2, b, c)$
b – EVEN ~~ODD~~: $gcd(a, b, c) = gcd(a, b/2, c)$
c – EVEN ~~ODD~~: $gcd(a, b, c) = gcd(a, b, c/2)$

- All ODD:

Assume $\min(a, b, c) = a$, else swap to make 'a' the min.

$$gcd(a, b, c) = gcd(a, b-a, c-a)$$