

Name: Mohammad Elkholy ID: 900202189

Q1) $g(U, V, U) :- V = 0.$

$g(U, V, X) :- \text{not}(V = 0),$
 $Y \text{ is } U \bmod V,$
 $g(V, Y, X)$

query: $g(75, 45, Z)$

output: $Z = 15$

This programme computes gcd of (U, V)

1. if $V = 0$, then $\text{gcd}(U, V) = U$

2. if $V \neq 0 \wedge Y = U \bmod V \wedge g(V, U \bmod V)$
 $\text{gcd}(U, V) = X.$

Q2) $a([], x, x).$

$a([A|X], Y, [A|Z]) :- a(X, Y, Z)$

query: $a([6, a, b, c], [w, z], Z)$

output: $Z = [6, a, b, c, w, z]$

Functionality of program: concatenates a list.

1. $a([], X, X) \Rightarrow$ if list is empty, then new list is X

2. $a([A|X], Y, [A|Z]) :- a(X, Y, Z).$

\Rightarrow if list not empty, concatenate

Head of list (A) that has tail X with Y

recursively & store new in the form

$[Head | New\ list]$.