Name: Sohel Momin

Roll No:1513126/A4

**CSS Experiment 1**

**Program**:

% Extended Euclidean Theorem to calculate GCD, Multiplicative Inverse

clc;clear variables;close all;

r1 = input('Enter a -> ');

r2 = input('Enter b -> ');

[mi,gcd] = mulinv(r1,r2);

if gcd == 1

fprintf('GCD( %d, %d)= %d and the Multiplicative inverse is %d\n ',r1,r2,gcd,mi);

else

fprintf('GCD( %d, %d)= %d and hence Multiplicative inverse does not exist.\n ',r1,r2,gcd);

end

**Function to calculate GCD, Multiplicative Inverse**

function [mi,gcd] = mulinv(r1,r2)

[a,b,s1,s2,t1,t2] = deal(r1,r2,1,0,0,1);

while(r2 ~= 0)

q = floor(r1/r2);

r = r1-(r2\*q);

s = s1-(s2\*q);

t = t1-(t2\*q);

[r1,r2,s1,s2,t1,t2] = deal(r2,r,s2,s,t2,t);

end

gcd = r1;

mi = mod(s1,b);

end

**Output (1)**

Enter a -> 1071

Enter b -> 462

GCD( 1071, 462)= 21 and hence Multiplicative inverse does not exist.

**Output (2)**

Enter a -> 7

Enter b -> 26

GCD( 7, 26)= 1 and the Multiplicative inverse is 15