NAME:Hayden Cordeiro **BATCH:D** **ROLL NO.:05**

EXPERIMENT NO.: 04

Aim : Simulation of Fuzzy Operations

Learning Objective : Simulation of Fuzzy Operations.

Learning Outcome : Students are able to successfully Simulate Fuzzy Operations.

Course Outcome

CSL703.5 To realize the basic Fuzzy operations

Program Outcome
(PO 3) Design/ development of solutions: Breadth and uniqueness of engineering problems i.e. the extent to
which problems are original and to which solutions have previously been identified or codified
(PO 12) Lifelong Learning

Bloom's Taxonomy Level
- Remembering
- Understanding

Theory:
Fuzzy logic is a super set of conventional (or Boolean) logic and contains similarities and differences with Boolean logic. Fuzzy logic is similar to Boolean logic, in that Boolean logic results are returned by fuzzy logic operations when all fuzzy memberships are restricted to 0 and 1. Fuzzy logic differs from Boolean logic in that it is permissive of natural language queries and is more like human thinking; it is based on degrees of truth.
The graphical representation of fuzzy and boolean sets are different as well.
A fuzzy set is a pair (A,m) where A is a set and m : A -->[0,1].
For each x ε A, m(x) is called the grade of membership of x in (A,m). For a finite set A = {x1,...,xn}, the fuzzy set (A,m) is often denoted by {m(x1) / x1,...,m(xn) / xn}.
Let x ε A. Then x is called not included in the fuzzy set (A,m) if m(x) = 0, x is called fully included if m(x) = 1, and x is called a fuzzy member if 0 < m(x) < 1.The set { x ε A | m(x) > 0 } is called the support of (A,m) and the set { x ε A | m(x) =1 } is called its kernel.

Fuzzy Addition
Let us consider A_1 = [a,b] and A_2 = [c,d]
The addition of A_1 and A_2 is: [a,b] + [c,d] = [a+c, b+d]

Fuzzy Subtraction
Let us consider A_1 = [a,b] and A_2 = [c,d]
The subtraction of A_1 and A_2 is: [a,b] - [c,d] = [a-d, b-c]

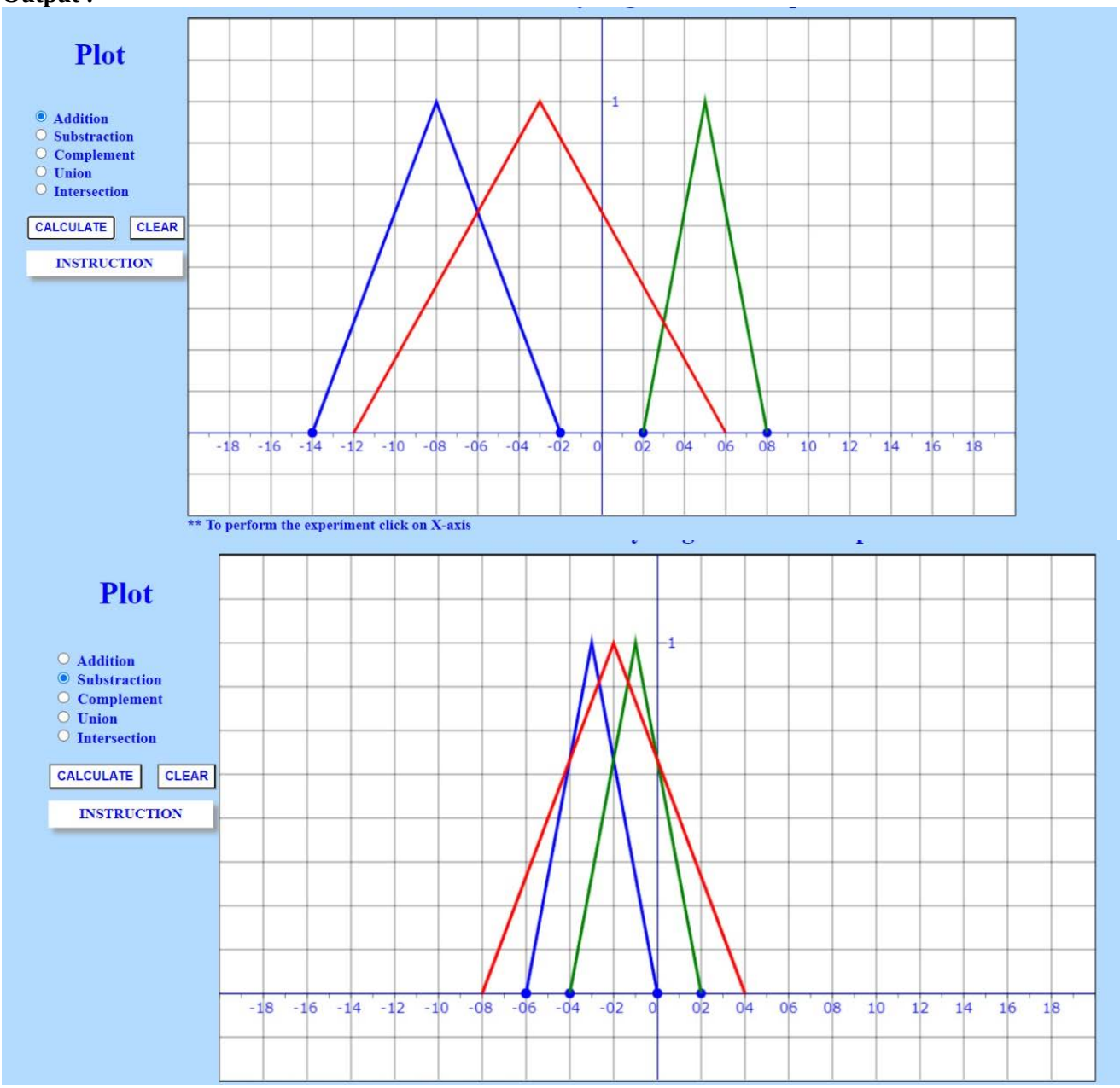
Fuzzy Complement
The degree to which you believe something is not in the set is 1.0 minus the degree to which you believe it is in the set.

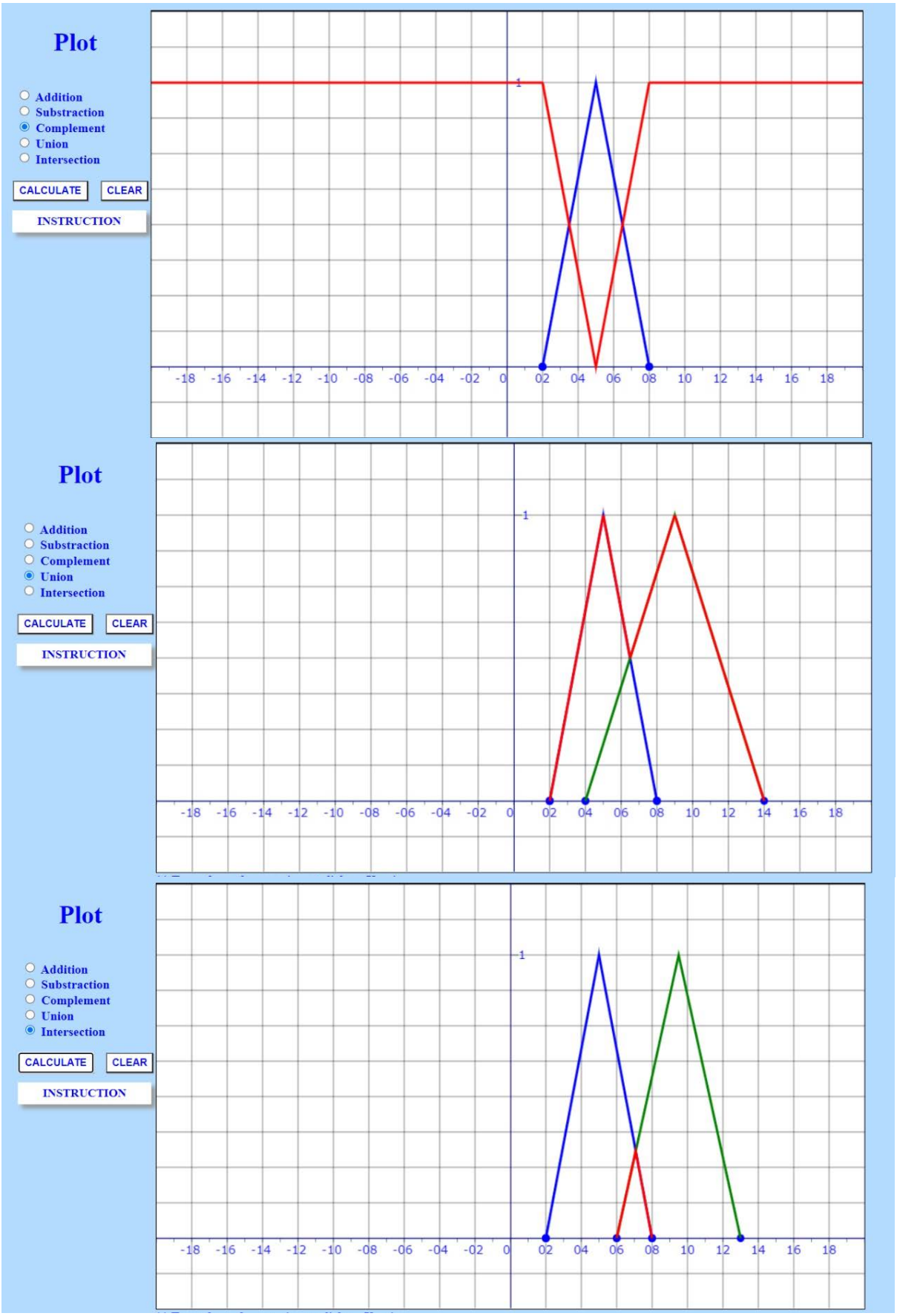
Fuzzy Intersection
If you have x degree of faith in statement A, and y degree of faith in statement B, how much faith do you have in statement A and B?
Eg: How much faith in "that person is about 6' high and tall"

Fuzzy Union

If you have x degree of faith in statement A, and y degree of faith in statement B, how much faith do you have in statement A or B?
Eg: How much faith in "that person is about 6' high or tall"

Output :





Conclusion: Simulation of Fuzzy Operations is successfully demonstrated.