Jordan Drexler
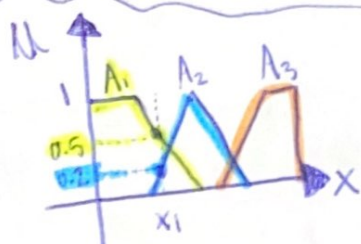DSC 540: Assignment 6 (Fuzzy Logic Models)

Part 1 - Theory

Rule 1: If x is A_3 OR y is B_1 THEN z is C_1
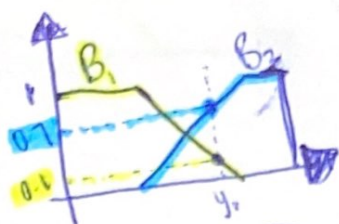Rule 2: If x is A_2 AND y is B_2 THEN z is C_2
Rule 3: If x is A_1 THEN z is C_3
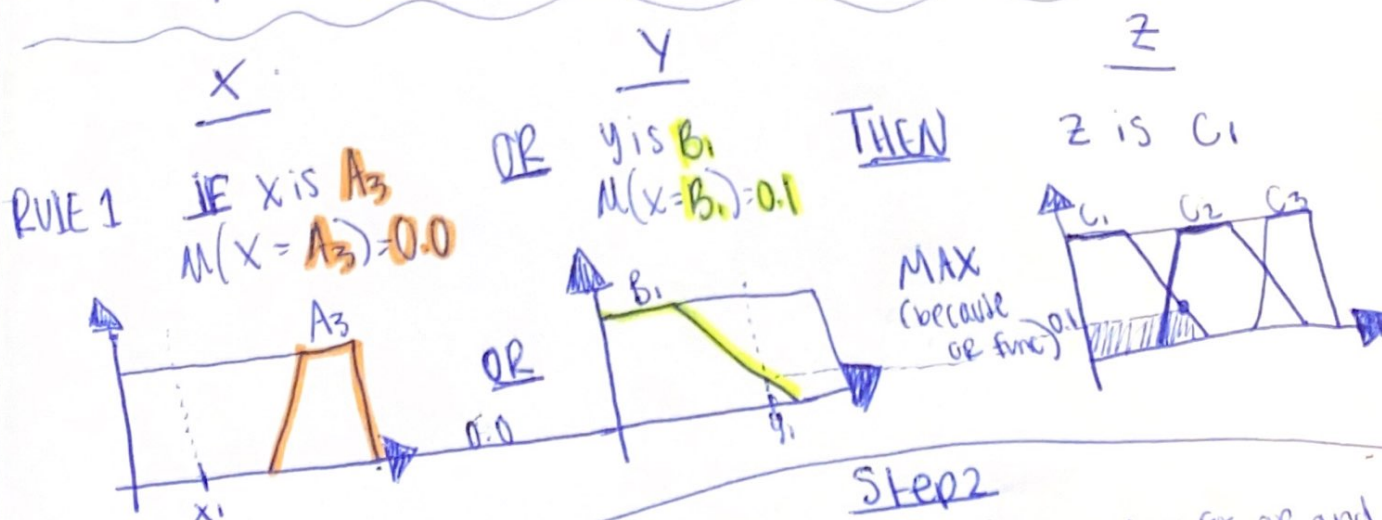

$M(x=A_1) = 0.5$
$M(x=A_2) = 0.2$
$M(x=A_3) = 0.0$

$M(x=B_1) = 0.1$
$M(x=B_2) = 0.7$
$M(x=B$

Step 1

Using the graphs, find where the actual inputs (x, & y,) or crisp inputs, and see where they land on each graph below

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X

Y

Z

RULE 1   IF x is A_3 OR   y is B_1 THEN   z is C_1
$M(x=A_3)=0.0$ $M(x=B_1)=0.1$

OR

0.0

MAX (because or func) 0.1

Step 2

For each rule, (using max for OR and min for AND) combine the placement where the crisp inputs landed on each graph, to find based off each rule, what the z (ci) region is.
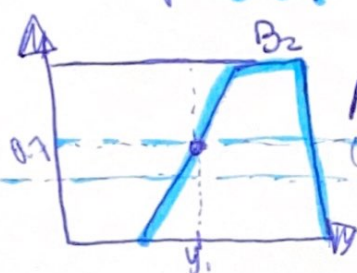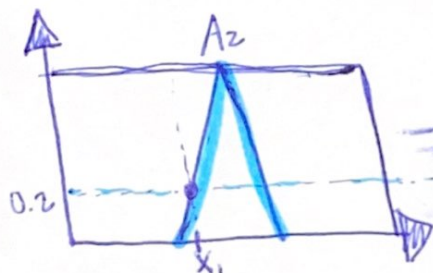
$$X \qquad\qquad Y \qquad\qquad Z$$
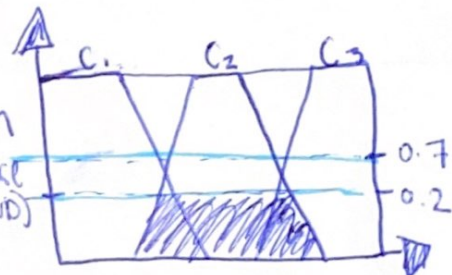
RULE2 IF x is A_2 AND y is B_2 THEN z is C_2

$$\mu(x = A_2) = 0.2 \qquad\qquad \mu(y = B_2) = 0.7$$

Min
(because
AND)

0.7
0.2

$$X \qquad\qquad Y \qquad\qquad \underline{Z}$$

$$\text{z is } C_3$$

RULE3 IF x is A_1 THEN z is C_3

$$\mu(x = A_1) = 0.5$$

0.5