The University of Jordan
School of Engineering
Electrical Engineering Department

EE 449
Instrumentation and Control Lab

EXPERIMENT 3 REPORT
INTRODUCTION TO FUZZY LOGIC CONTROL

Section # _____ Group # _____

	Student Name	ID
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EXPERIMENT 3
INTRODUCTION TO FUZZY LOGIC CONTROL

PROCEDURE A – FUZZY MEMBERSHIP

1. Increase the potentiometer output and record your results in the following table:

Input Voltage, Volt	**LP** degree of membership	**MP** degree of membership	**S** degree of membership	**MN** degree of membership	**LN** degree of membership
-8.2					
-3.5					
0					
+3.7					
+9.2					

PROCEDURE B – DEFUZZIFICATION

1. Change the fuzzy variables and record your results in the following table:

FV1	**FV2**	**Output**
S = 0.6	MP = 0.4	
MP = 0.5	LP = 0.5	
LN = 0.7	?	
S = 0.8	MN = 0.2	
MN = 1.0	??	

PROCEDURE C – FUZZY LOGIC OPERATORS: AND, OR, NOT

1. Perform the required connections and record your results in the following table:

Operation	**FV1**	**FV2**	**Output**	**Output with NOT**
AND	0.2	0.8		
OR	0.2	0.8		

2. Use your results to write relations that define the fuzzy AND, OR and NOT operations.

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PROCEDURE 2 – PROPORTIONAL CONTROL OF THE THERMAL CONTROL PROCESS

1. Complete the following rule set so that it operates in a similar manner to a conventional proportional controller.

Rule 1: `If {error LN} THEN {control _____}`

Rule 2: `If {error MN} THEN {control _____}`

Rule 3: `If {error S} THEN {control _____}`

Rule 4: `If {error MP} THEN {control _____}`

Rule 5: `If {error LP} THEN {control _____}`

2. If you were to design a fuzzy control system to control both a heater (that generates heat) and a fan (that helps spread the heat quickly) based on the desired room temperature, write an example of IF-THEN rule using the following five temperature levels:

- Large Negative (LN) = very cold
- Medium Negative (MN) = cold
- Small (S) = moderate
- Medium Positive (MP) = Warm
- Large Positive (LP) = Very hot

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