

Logic Building Day-6

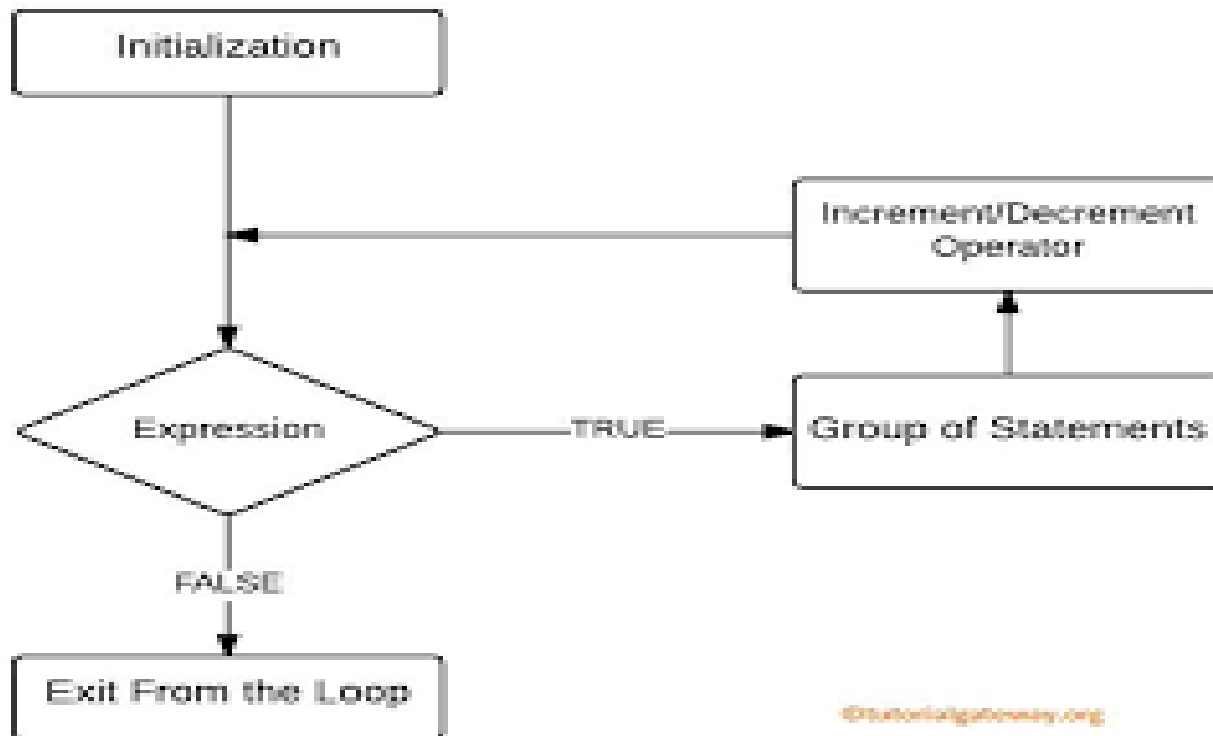
Presented By: Dr. Abhay Kothari

Prof. Mubeen A. Khan

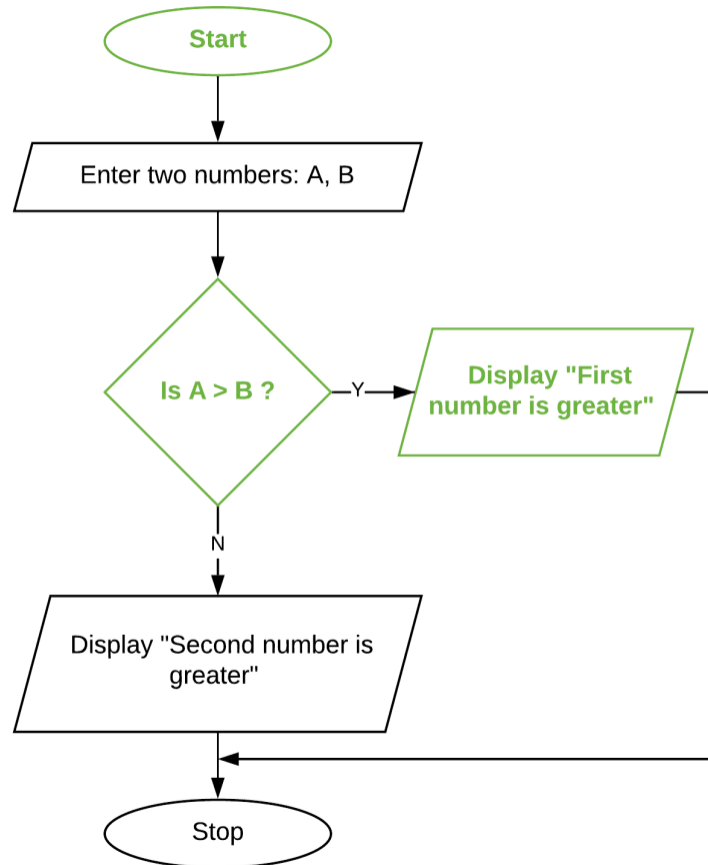
Contents

- Logics for Increment and Decrement operator
- Logics for Less than Greater than operator
- Logics for arrays
- Matrix addition
- Logics for Determinants
- Logics for system of equations(one variable)
- Logics for finding roots of equations
- Logics for Fuzzy logics

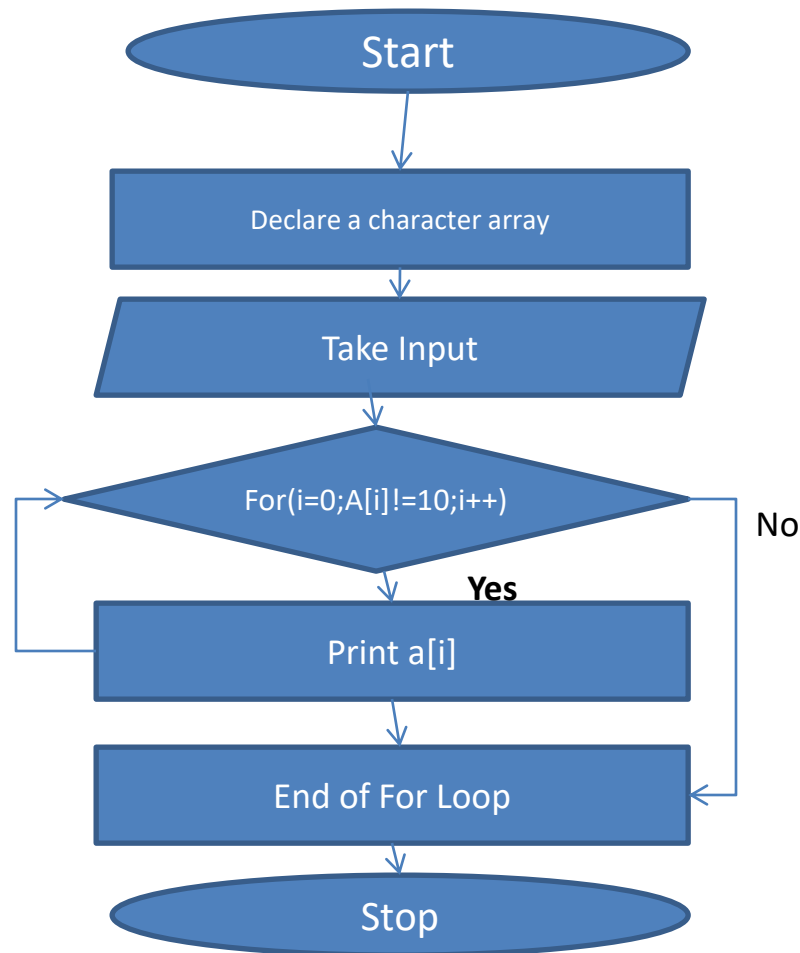
Increment Decrement operators



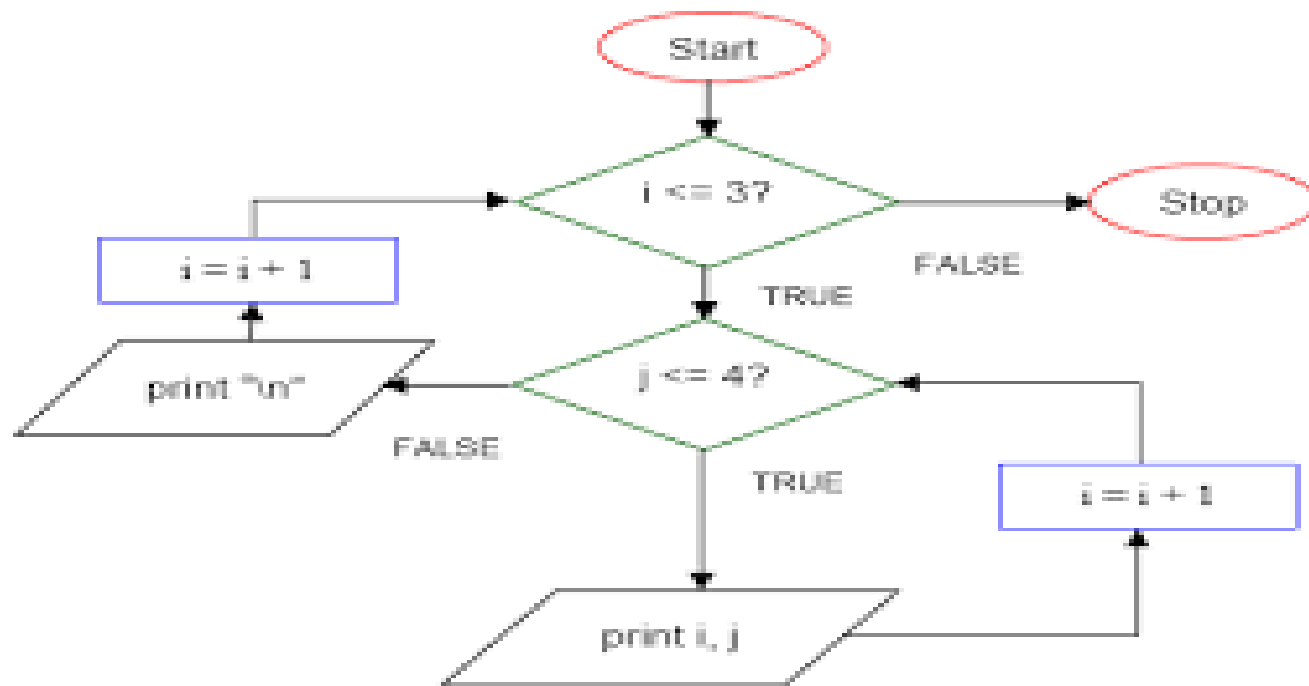
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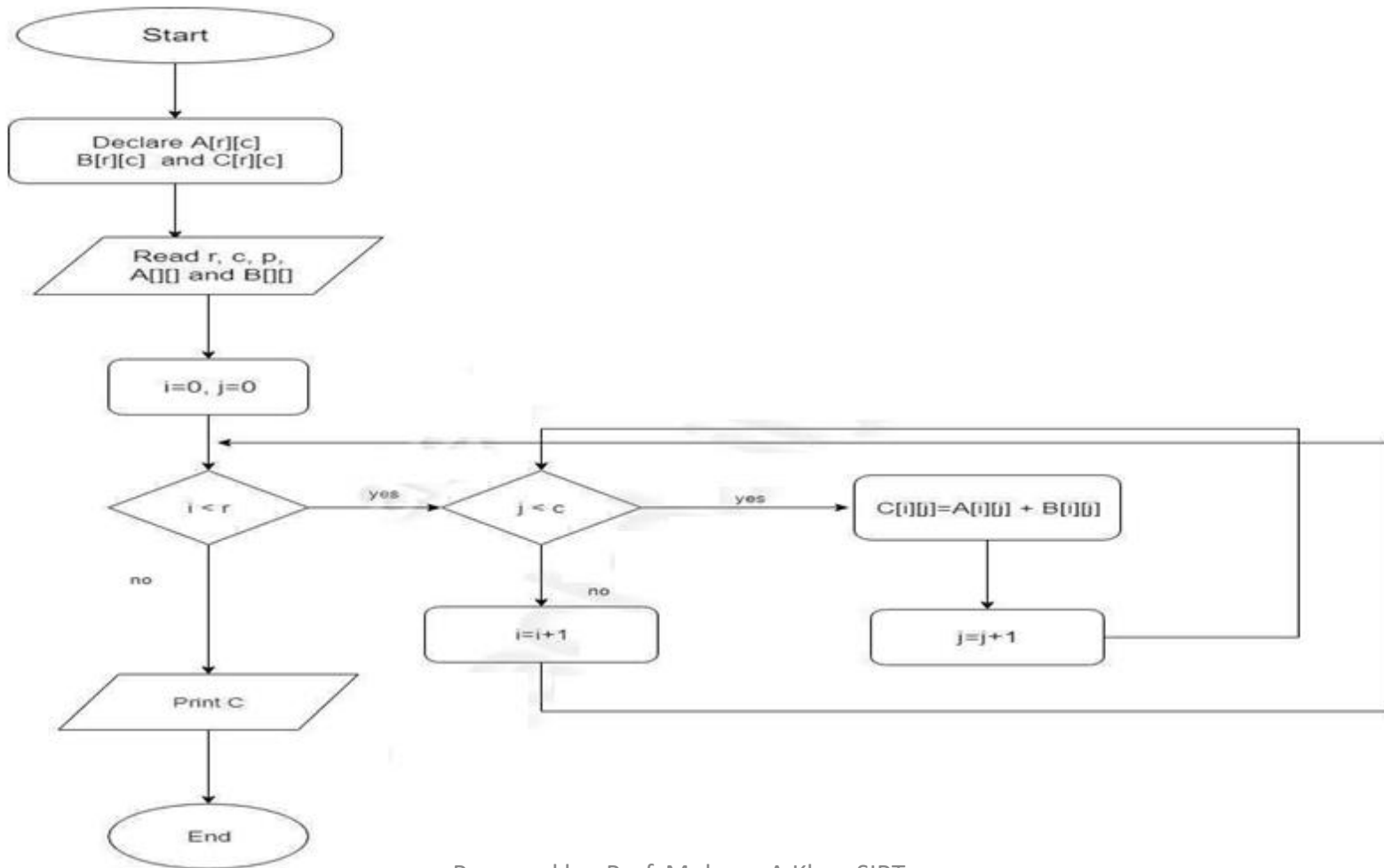
Character Array



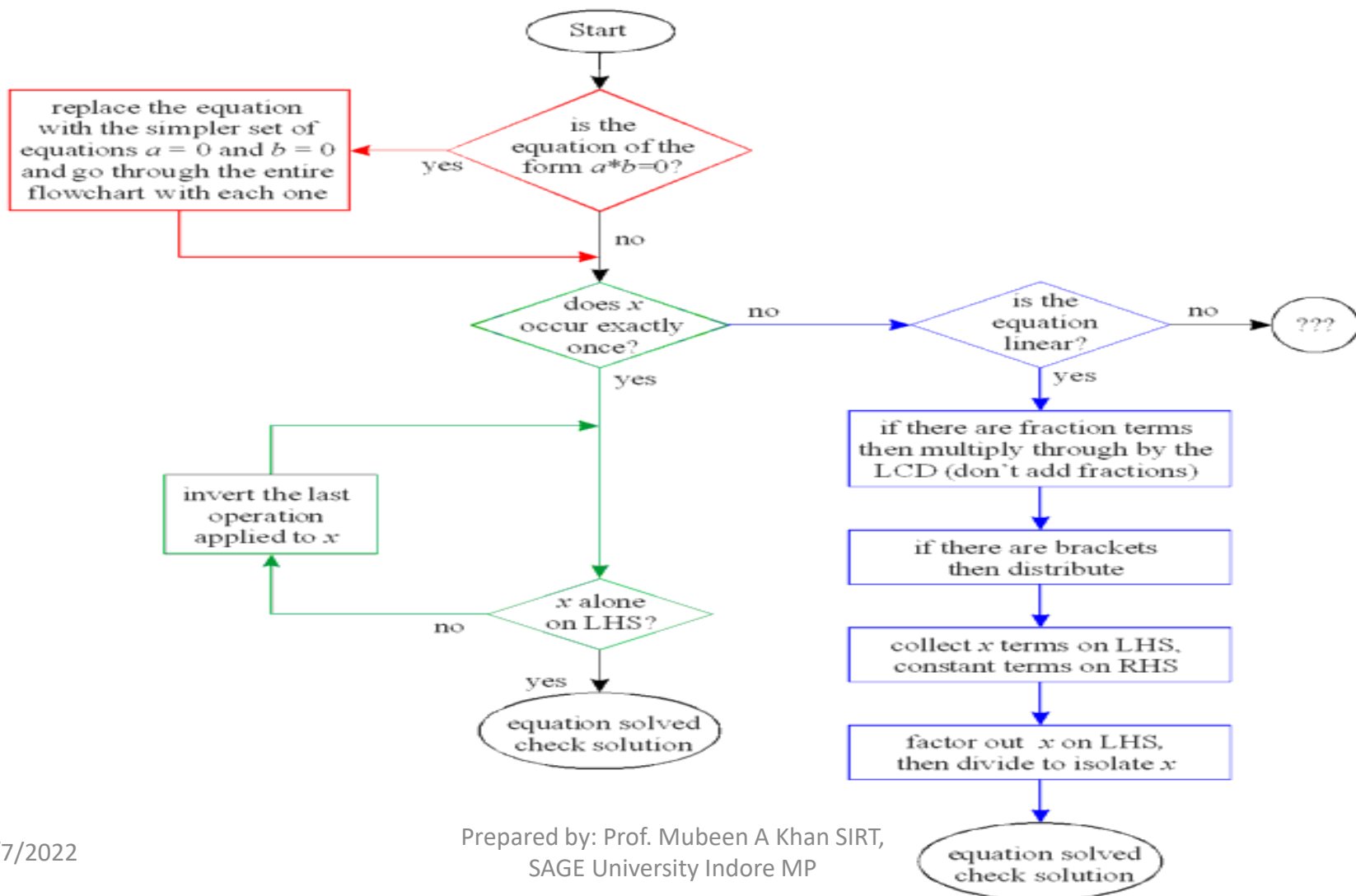
What will be the output?



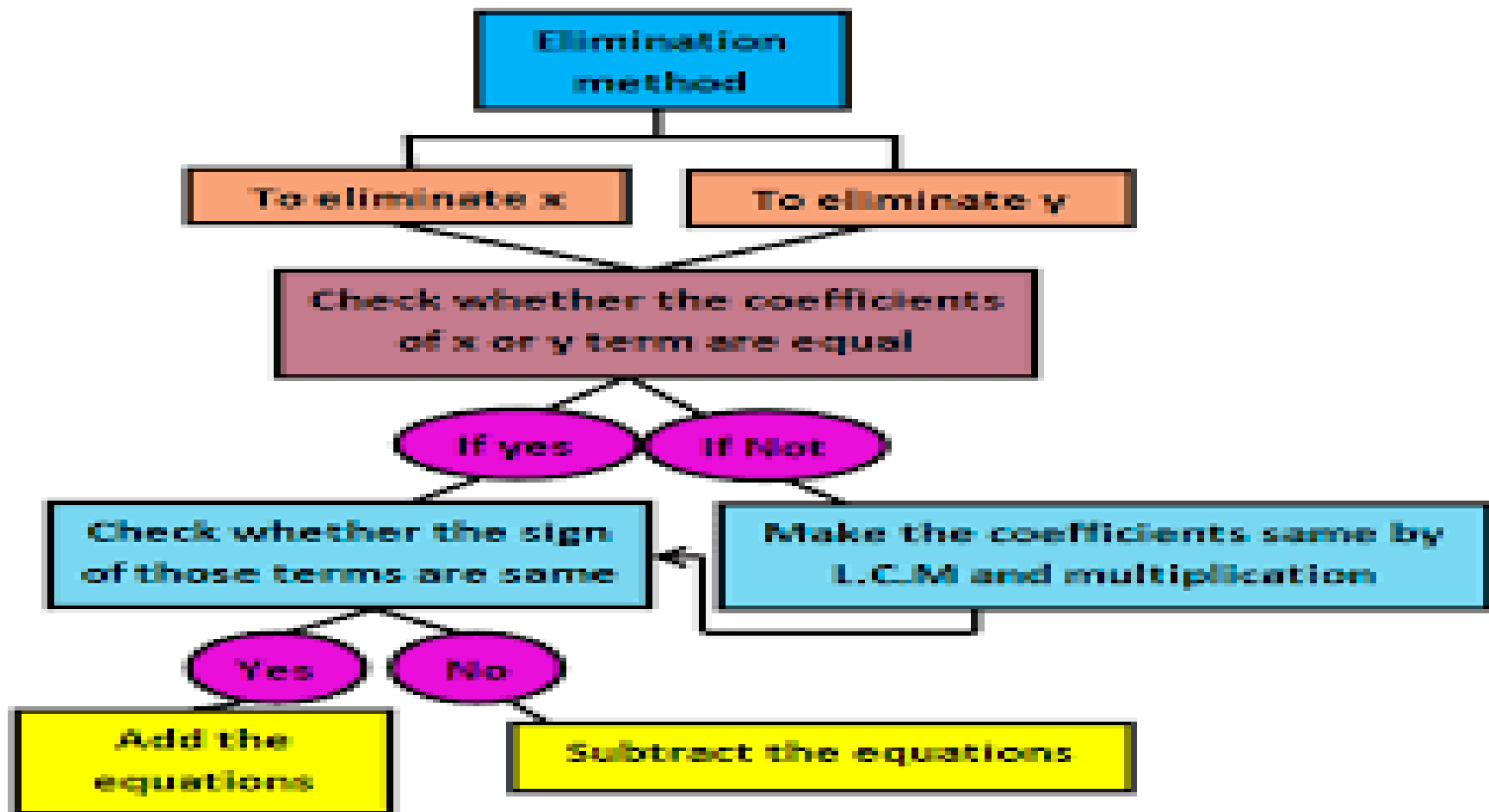
Matrix addition



One variable equation



Two Variable Equation



Square Root

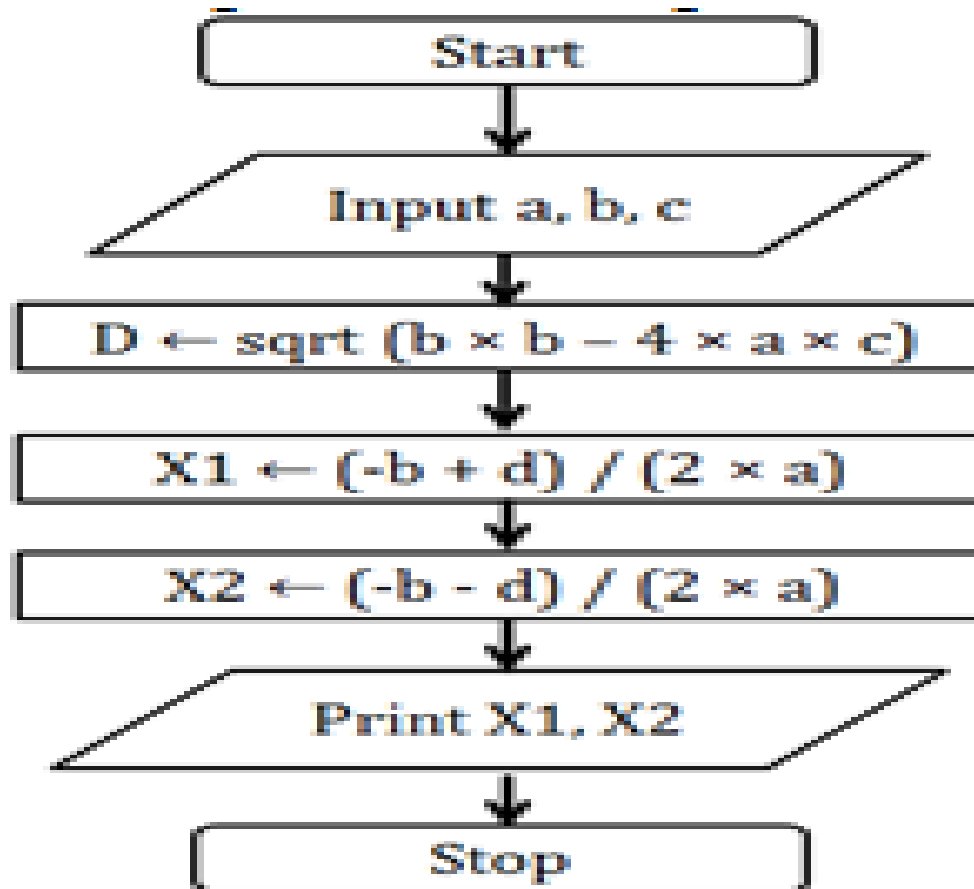
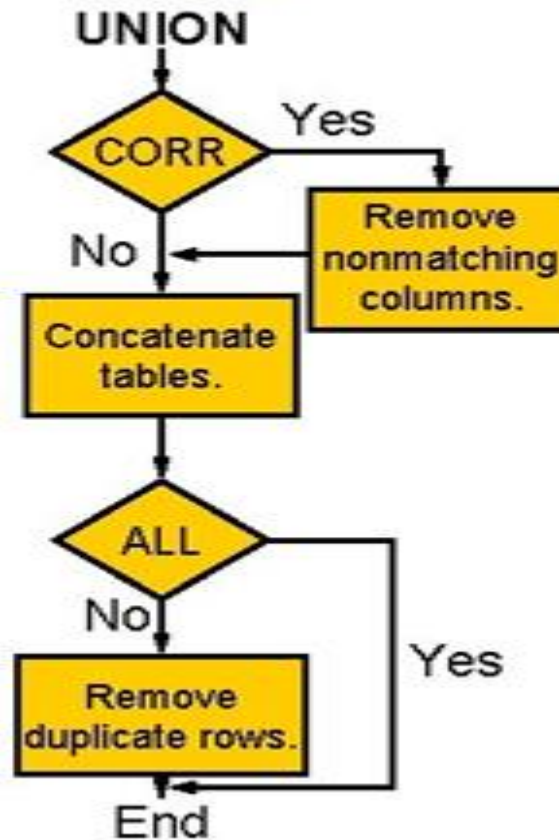


Figure 3

Fuzzy logics (Union)

Flow Diagram: UNION Operator



Example of Fuzzy sets

2. Consider two given fuzzy sets

$$\underline{A} = \left\{ \frac{1}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0.2}{8} \right\}$$

$$\underline{B} = \left\{ \frac{0.5}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{1}{8} \right\}$$

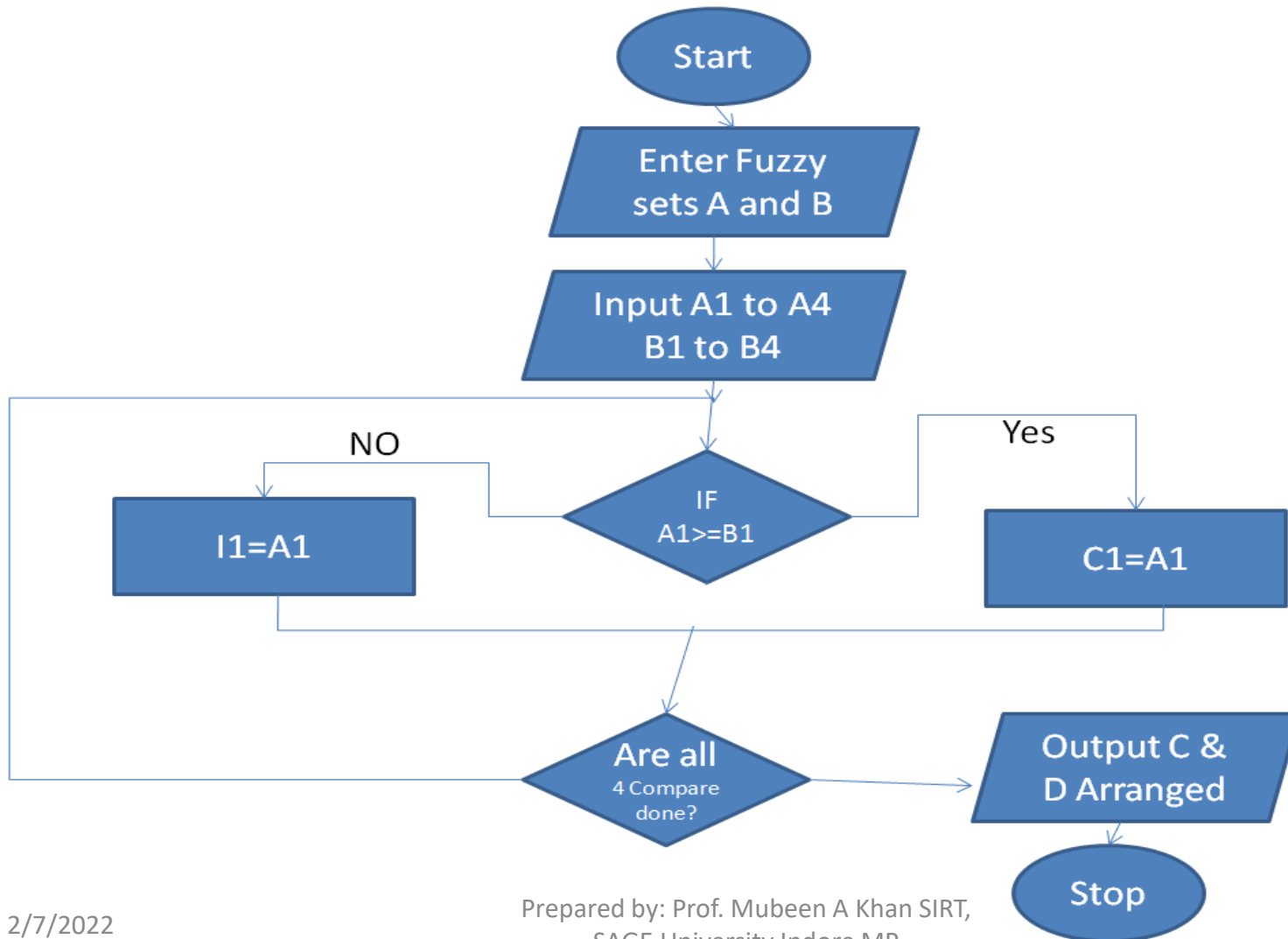
Perform union, intersection, difference and complement over fuzzy sets \underline{A} and \underline{B} .

Example of Union

(a) Union

$$\begin{aligned} \underline{A} \cup \underline{B} &= \max\{\mu_{\underline{A}}(x), \mu_{\underline{B}}(x)\} \\ &= \left\{ \frac{1}{2} + \frac{0.4}{4} + \frac{0.5}{6} + \frac{1}{8} \right\} \end{aligned}$$

Union and Intersection(Fuzzy)



Example of intersection, Complement and Difference

(b) Intersection

$$\begin{aligned} \underline{A} \cap \underline{B} &= \min\{\mu_{\underline{A}}(x), \mu_{\underline{B}}(x)\} \\ &= \left\{ \frac{0.5}{2} + \frac{0.3}{4} + \frac{0.1}{6} + \frac{0.2}{8} \right\} \end{aligned}$$

(c) Complement

$$\begin{aligned} \overline{\underline{A}} &= 1 - \mu_{\underline{A}}(x) = \left\{ \frac{0}{2} + \frac{0.7}{4} + \frac{0.5}{6} + \frac{0.8}{8} \right\} \\ \overline{\underline{B}} &= 1 - \mu_{\underline{B}}(x) = \left\{ \frac{0.5}{2} + \frac{0.6}{4} + \frac{0.9}{6} + \frac{0}{8} \right\} \end{aligned}$$

(d) Difference

$$\begin{aligned} \underline{A}|\underline{B} &= \underline{A} \cap \overline{\underline{B}} = \left\{ \frac{0.5}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0}{8} \right\} \\ \underline{B}|\underline{A} &= \underline{B} \cap \overline{\underline{A}} = \left\{ \frac{0}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{0.8}{8} \right\} \end{aligned}$$

Final Assignments

1. Write Programs and flow charts to Print these number patterns

<pre> 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 1 2 3 4 5 6 7 8 9 10 </pre>	<pre> 11111 11111 11011 11111 11111 </pre>					
<pre> 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 </pre>	<pre> 1 2 6 3 7 10 4 8 11 13 5 9 12 14 15 </pre>	<pre> 1111 0000 1111 0000 1111 </pre>	<pre> 5 44 333 2222 11111 </pre>	<pre> 1 12 123 1234 12345 </pre>	<pre> 1 1 2 2 3 3 4 4 5 4 4 3 3 2 2 1 1 </pre>	<pre> * *1* *121* *12321* *1234321* *123454321* *1234321* *12321* *121* *1* * </pre>
<pre> 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 </pre>	<pre> 1 1 2 1 2 3 1 2 3 4 1 2 3 4 5 </pre>	<pre> 11111 22222 33333 44444 55555 </pre>	<pre> 10101 10101 10101 10101 10101 </pre>	<pre> 1 22 333 4444 55555 </pre>	<pre> ***** **** **** *** *** ** ** * * * * ** ** *** *** **** **** ***** </pre>	<pre> * + + + + +++++++ + + + + + </pre>
<pre> 1 2 3 4 5 16 17 18 19 6 15 24 25 20 7 14 23 22 21 8 13 12 11 10 9 </pre>	<pre> 55555 44444 333 22 1 </pre>	<pre> 5 56789 13579 54 4567 3579 543 345 579 5432 23 79 54321 1 9 </pre>				

Final Assignments

2. Write Programs and flow charts to Print these patterns.

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Final Assignments

3. Write program to show Union, Intersection, compliment and difference in fuzzy logic if any input is given in array form.

Mail all these assignments to
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sagemubeen@gmail.com
or on before **11/02/2022**

THANK YOU
for your valuable Time