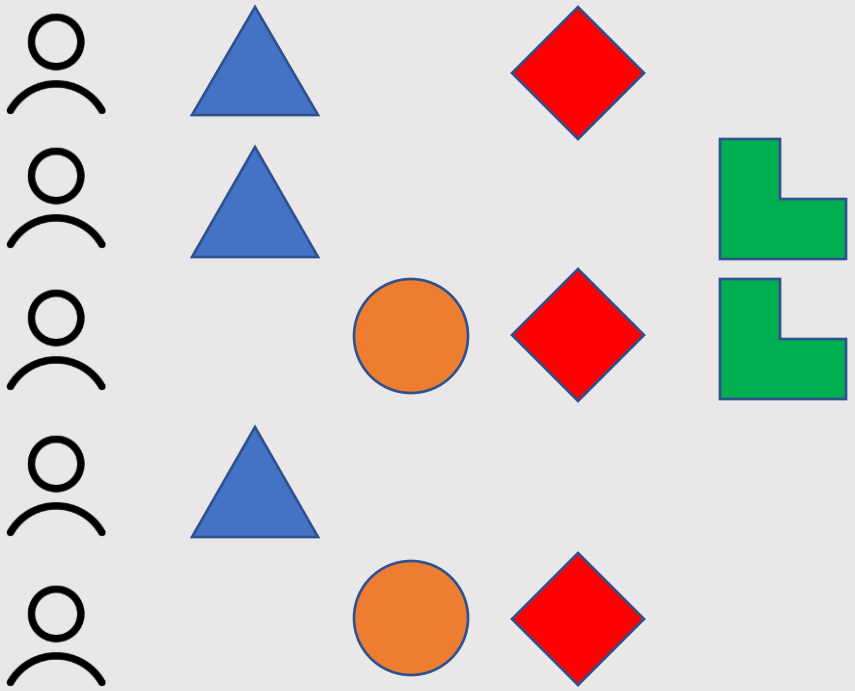
How are recommendations computed?

Eduardo Bonet
February 2021

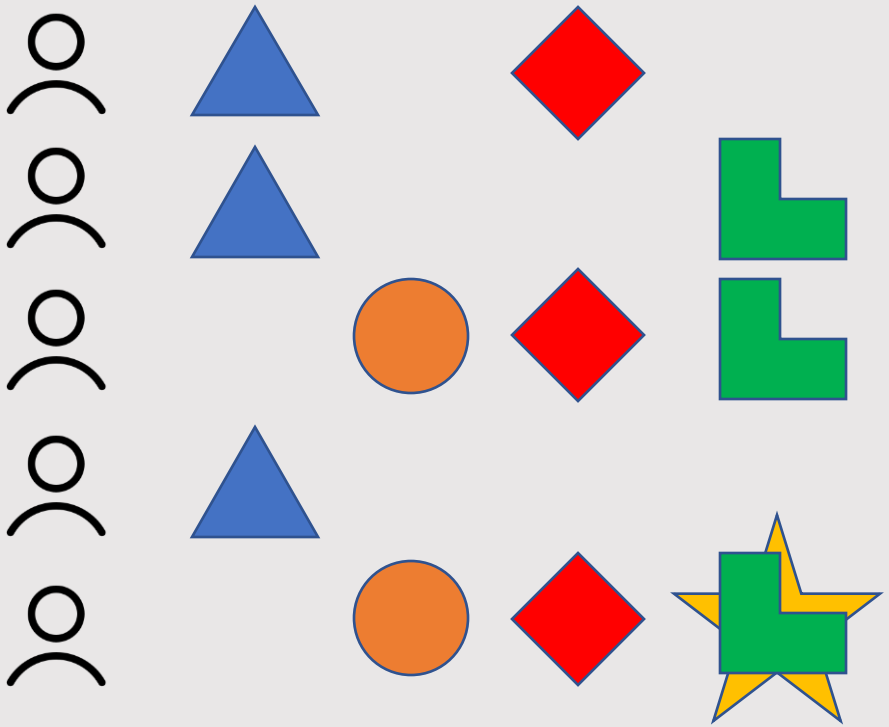
From the data, we look at **items frequently bought together**.

From there, we estimate the products the users are mostly likely to buy, based on their previous transactions

Suppose our customers bought the following products:

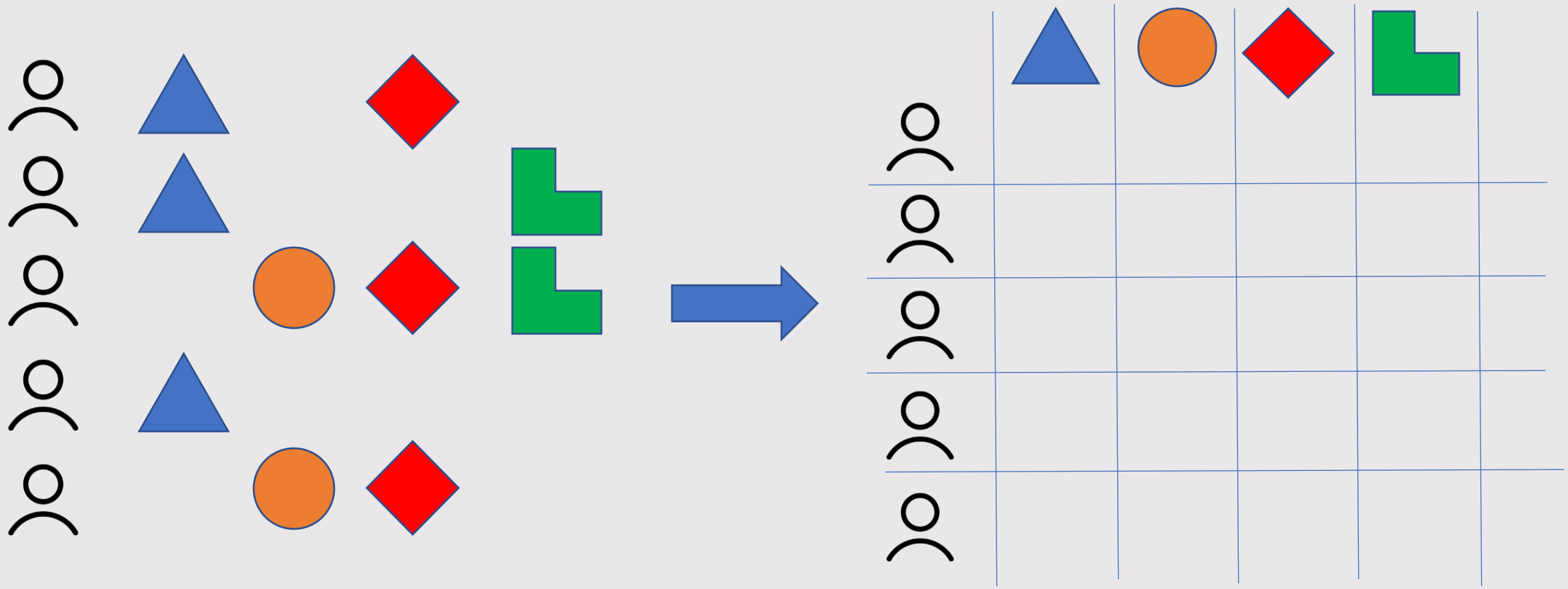


Suppose our customers bought the following products:



How do we transform it into a format we can work with?

How do we transform it into a format we can work with? Matrices!



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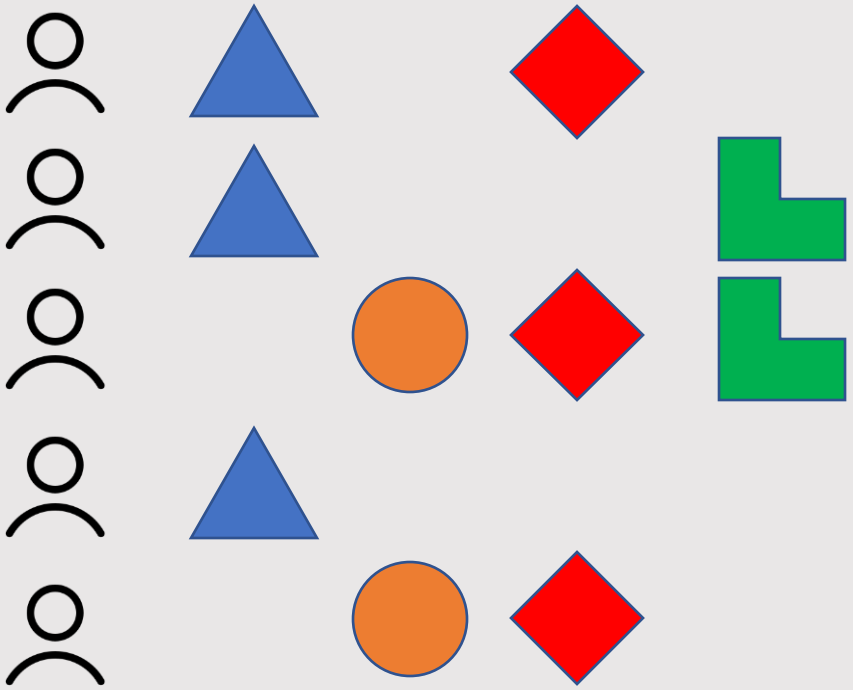

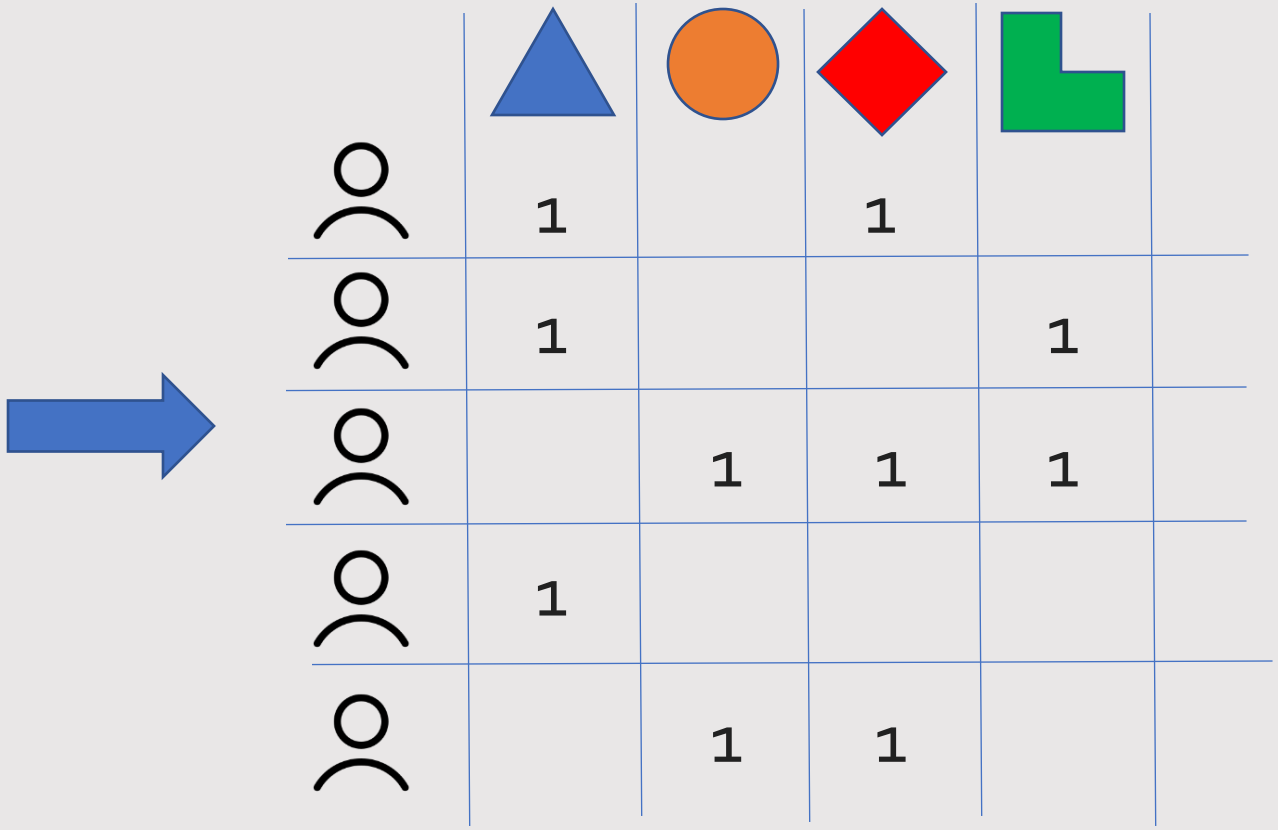

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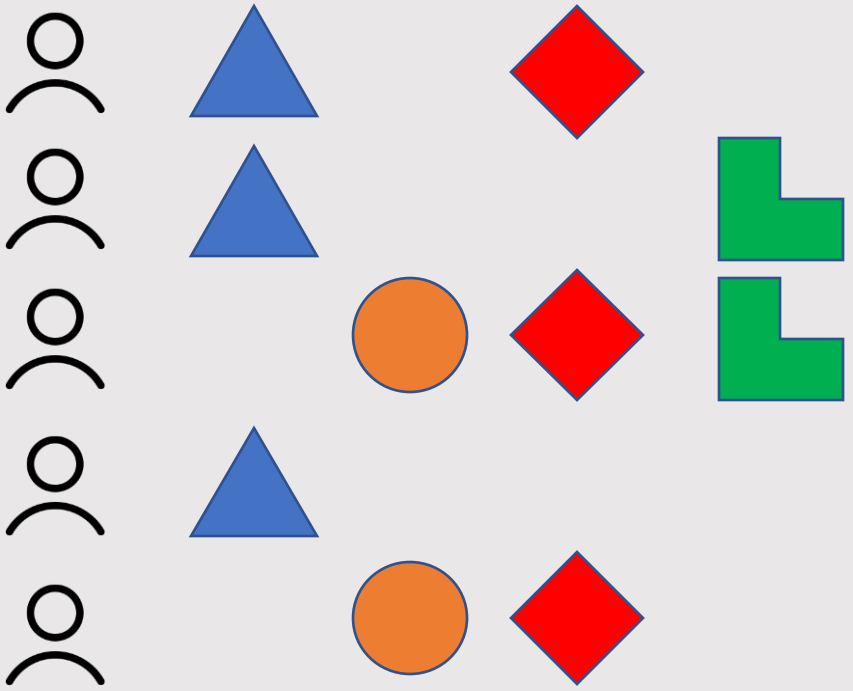
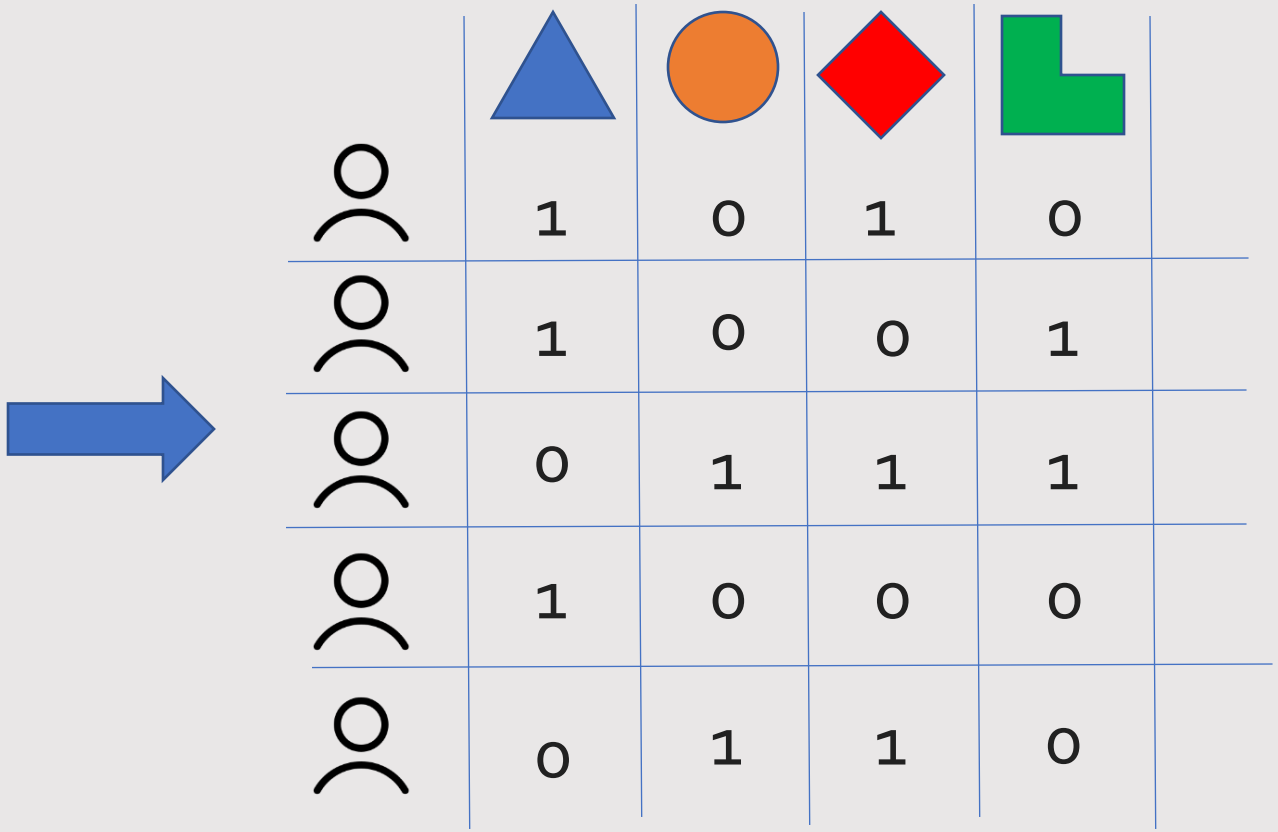




	1	0	1	0
	1	0	0	1
	0	1	1	1
	1	0	0	0
	0	1	1	0

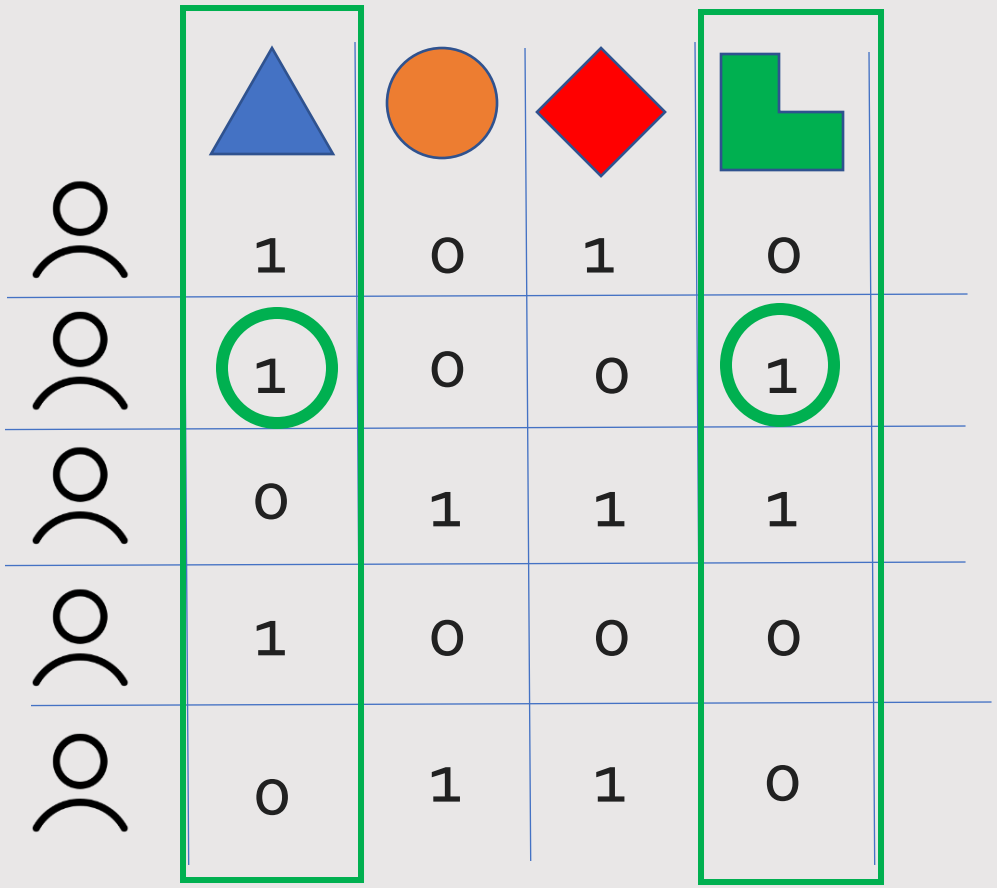
This is the Affinity Matrix:

					
	1	0	1	0	
	1	0	0	1	
	0	1	1	1	
	1	0	0	0	
	0	1	1	0	

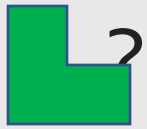
	1	0	1	0
	1	0	0	1
	0	1	1	1
	1	0	0	0
	0	1	1	0

How Similar is  to  ?

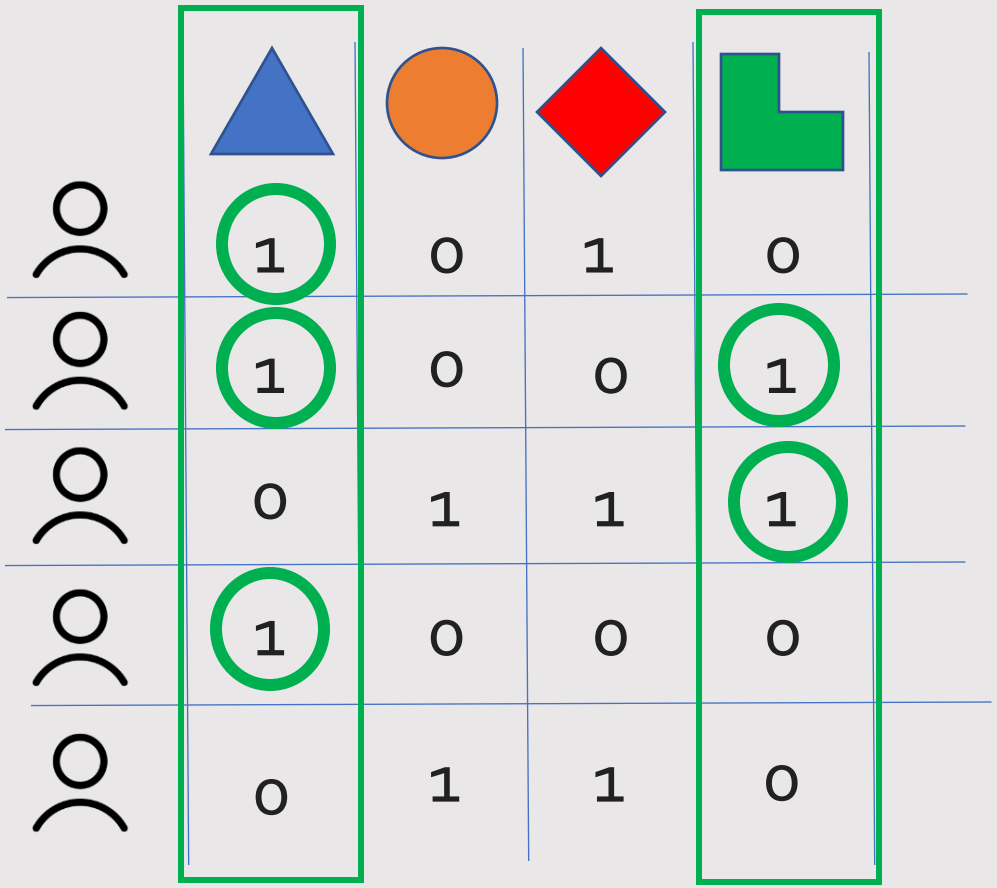
$$\frac{\text{(} \blacktriangle \text{ and } \bullet \text{)}}{\text{(} \blacktriangle \text{ or } \bullet \text{)}}$$



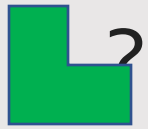
	1	0	1	0
	1	0	0	1
	0	1	1	1
	1	0	0	0
	0	1	1	0

How Similar is  to  ?

$$\frac{\text{(} \blacktriangle \text{ and } \llcorner \text{)}}{\text{(} \blacktriangle \text{ or } \llcorner \text{)}} = \frac{1}{}$$



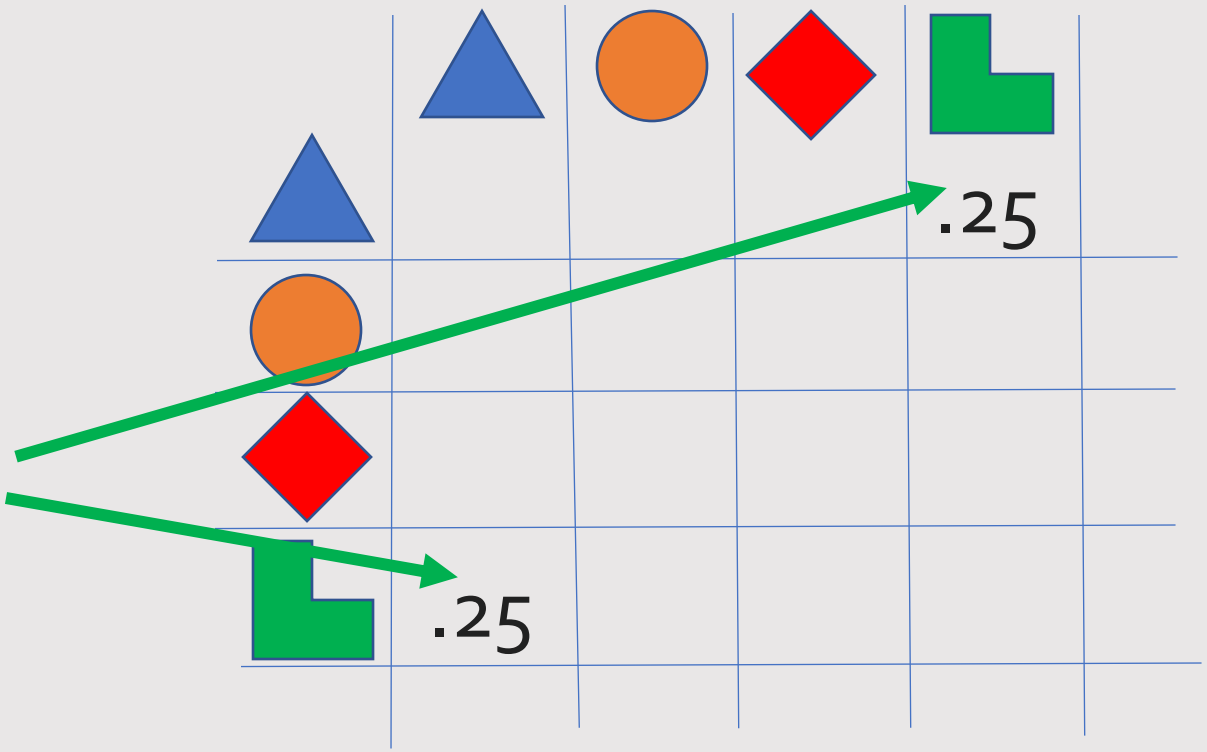
1	0	1	0
1	0	0	1
0	1	1	1
1	0	0	0
0	1	1	0

How Similar is  to  ?

$$\frac{\text{(} \blacktriangle \text{ and } \lrcorner \text{)}}{\text{(} \blacktriangle \text{ or } \lrcorner \text{)}} = \frac{1}{4}$$

How Similar is to ?

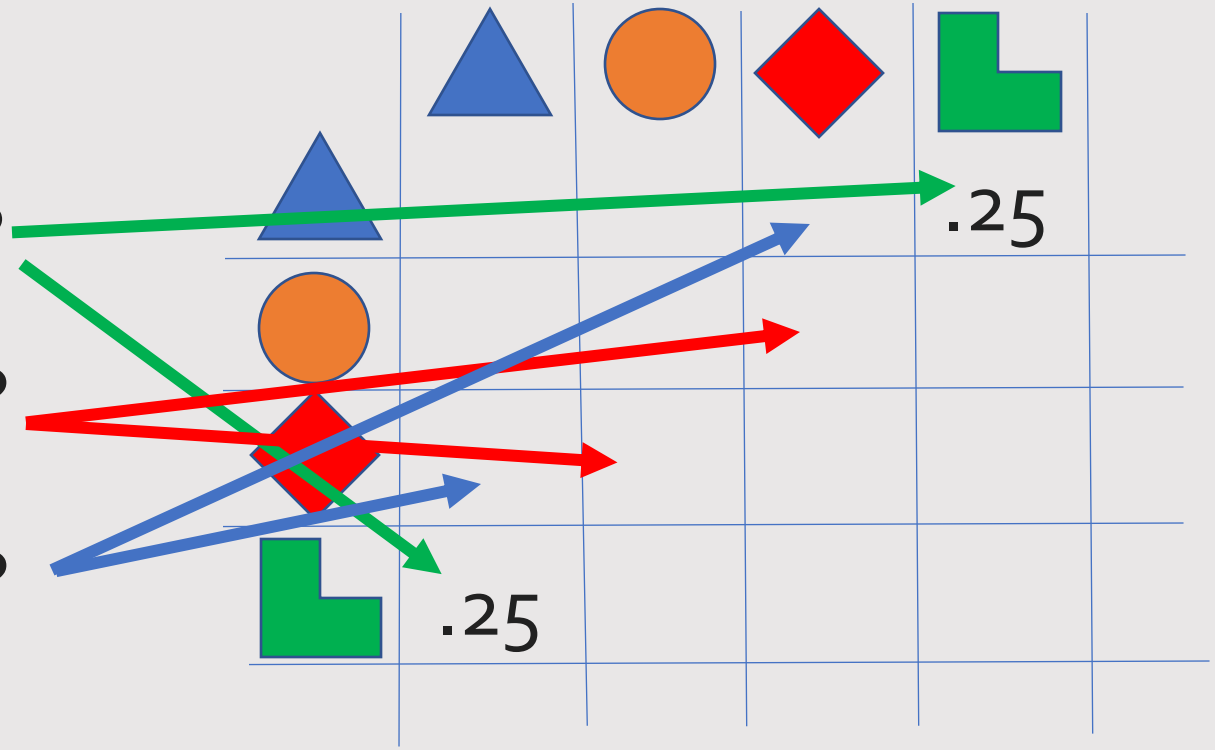
$$\frac{\text{(} \blacktriangle \text{ and } \text{L} \text{)}}{\text{(} \blacktriangle \text{ or } \text{L} \text{)}} = \frac{1}{4}$$

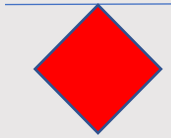


How Similar is  to  ?

How Similar is  to  ?

How Similar is  to  ?



					
	1	0	.2	.25	
	0	1	.66	.33	
	.2	.66	1	.25	
	.25	.33	.25	1	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MARCH 31ST

How do we use the Similarity Matrix for Recommendations?

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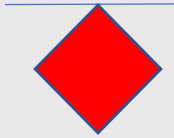
	1	0	.2	.25
	0	1	.66	.33
	.2	.66	1	.25
	.25	.33	.25	1

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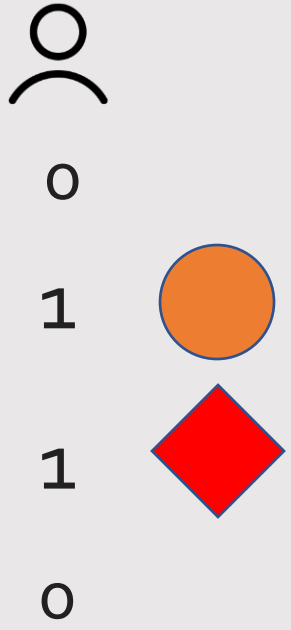
	1	0	.2	.25
	0	1	.66	.33
	.2	.66	1	.25
	.25	.33	.25	1



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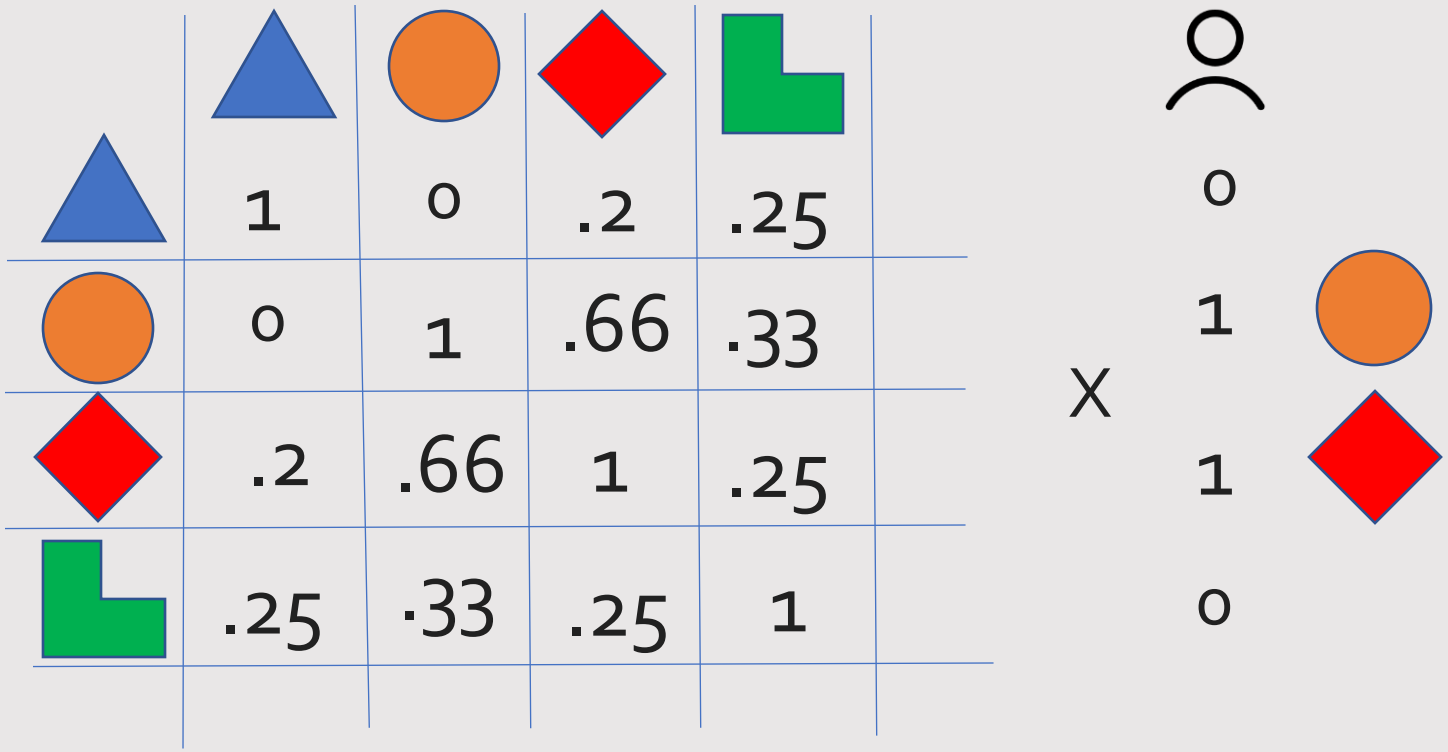
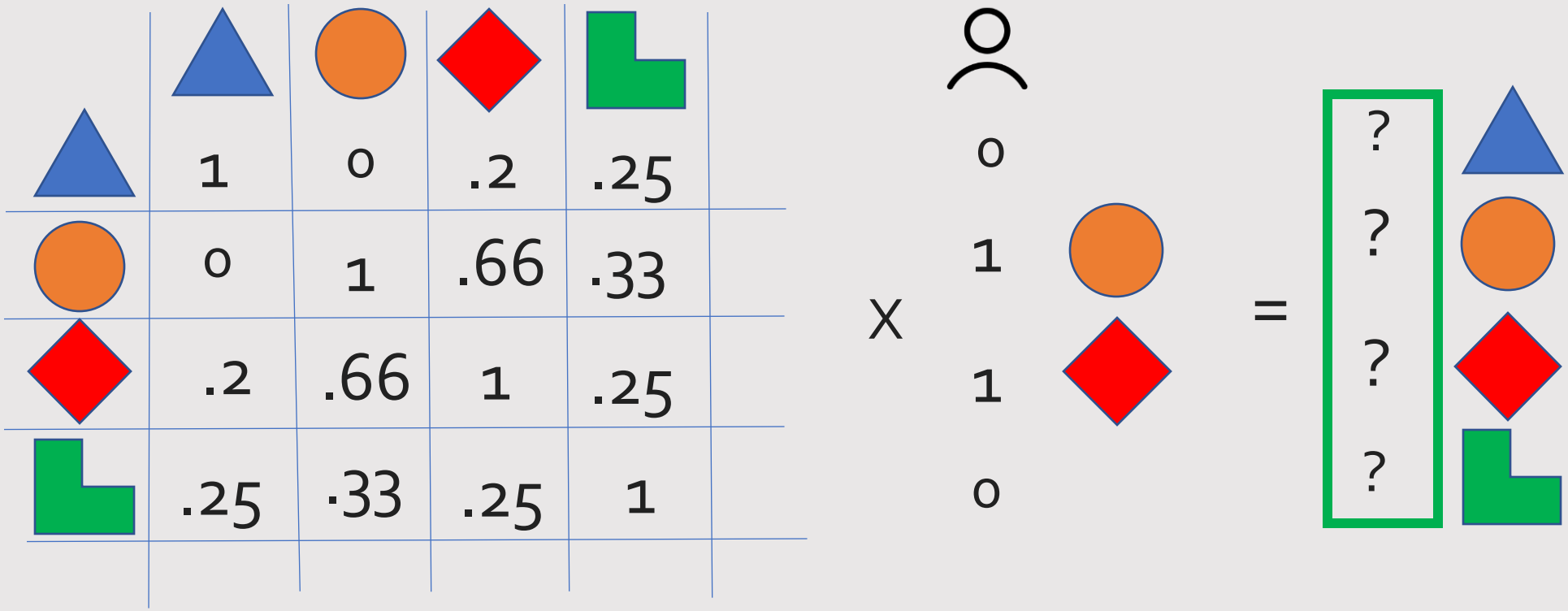


	1	0	.2	.25
	0	1	.66	.33
	.2	.66	1	.25
	.25	.33	.25	1

X

0
1
1
0

How do we use the Similarity Matrix for Recommendations?



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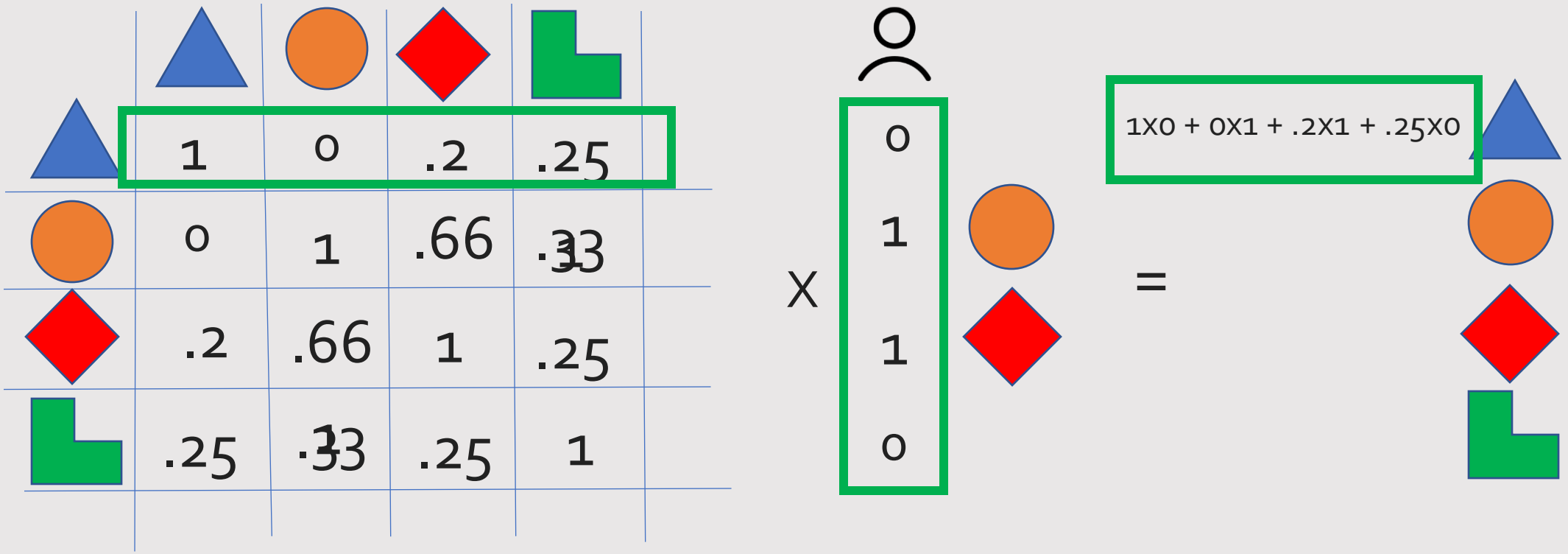

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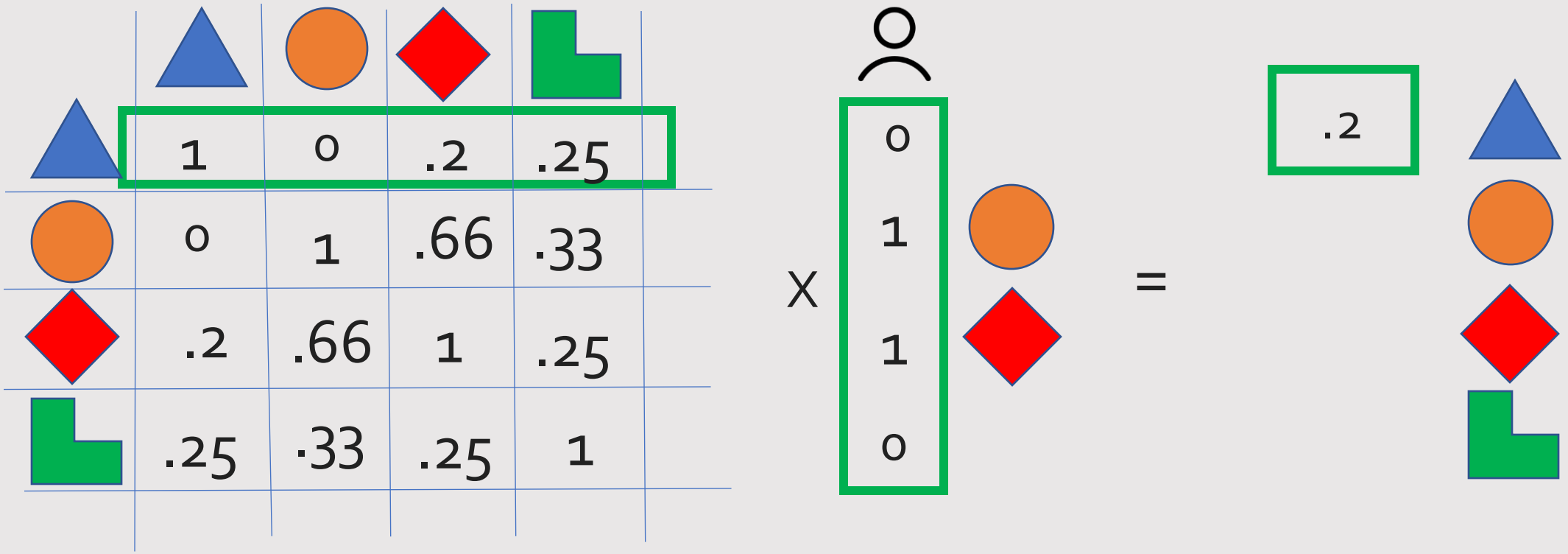

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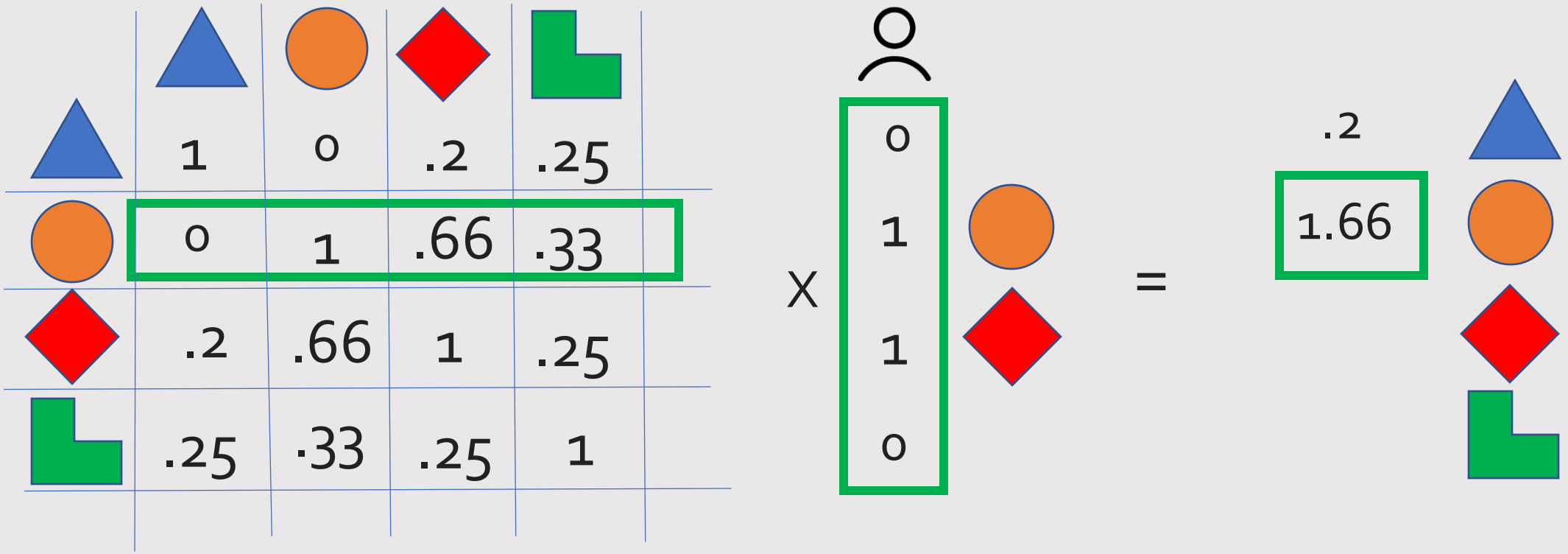

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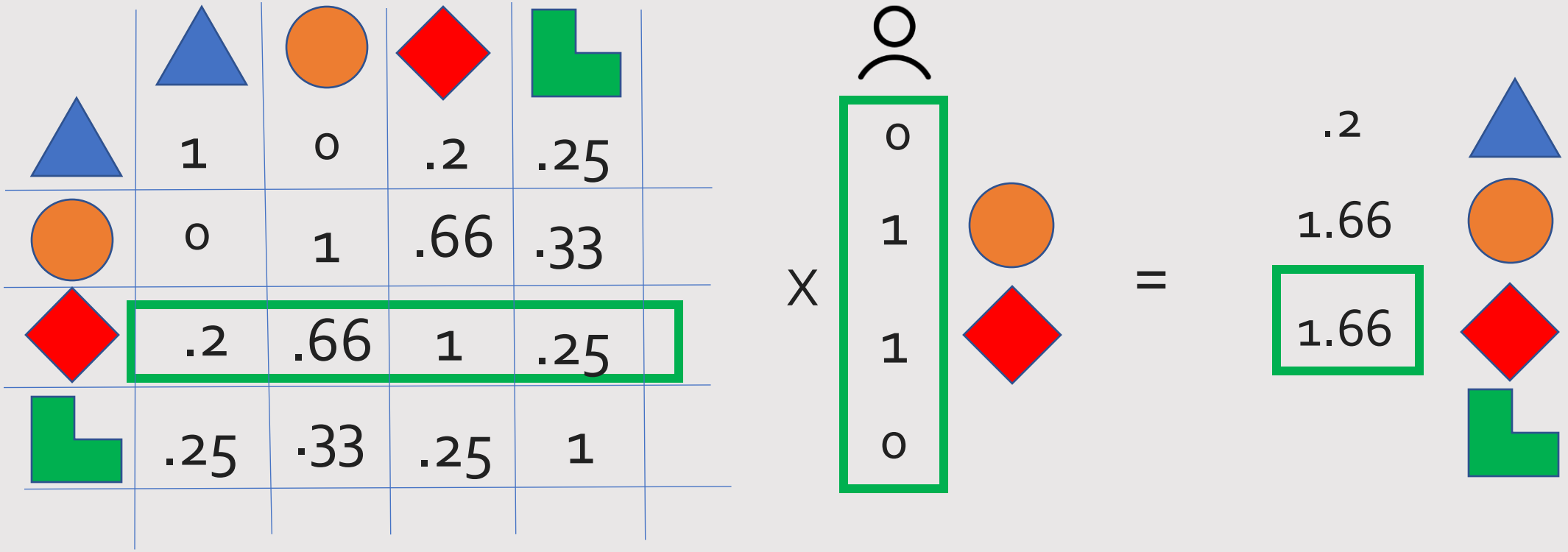

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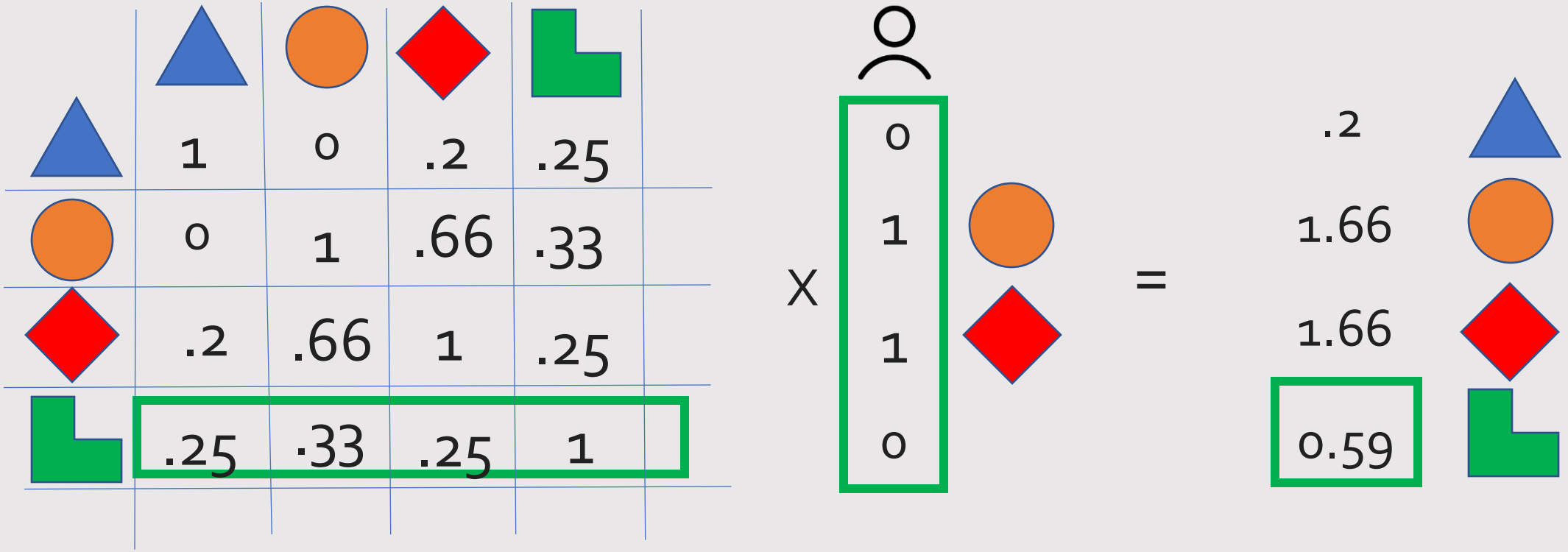

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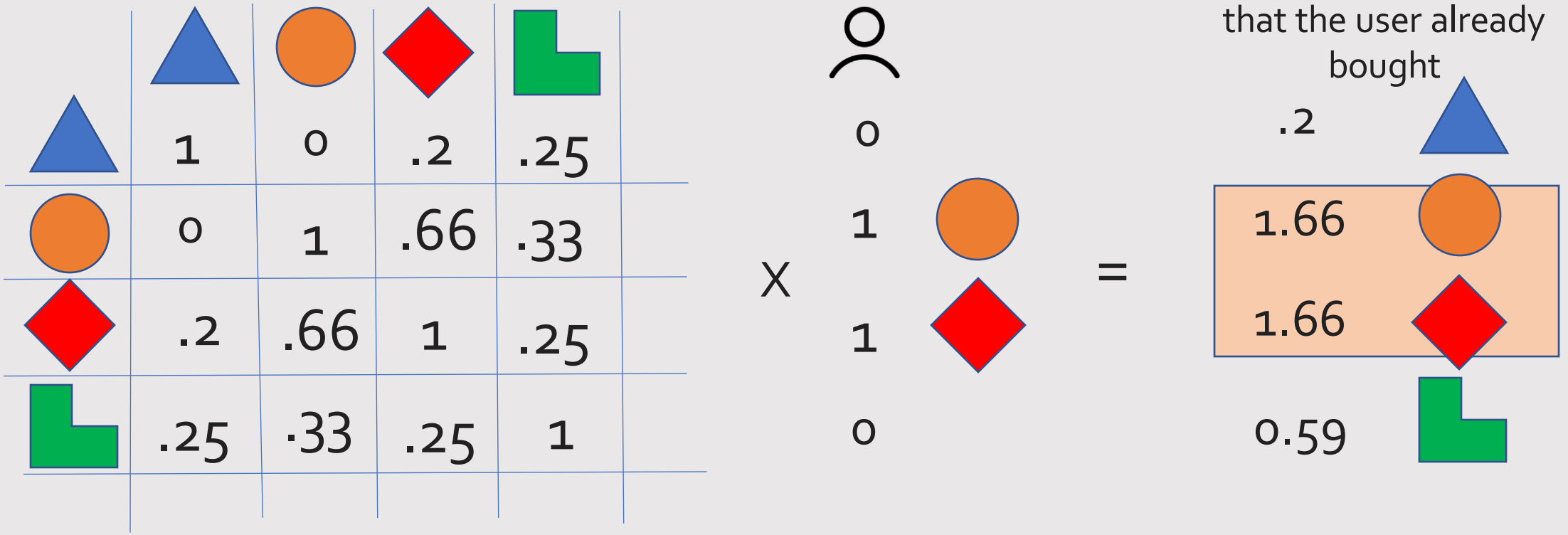

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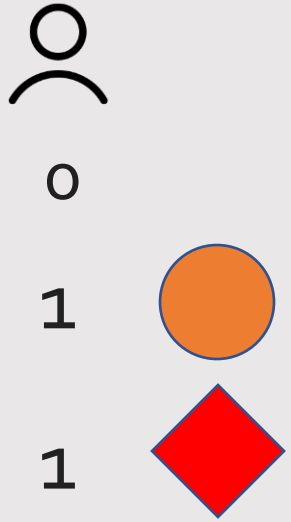
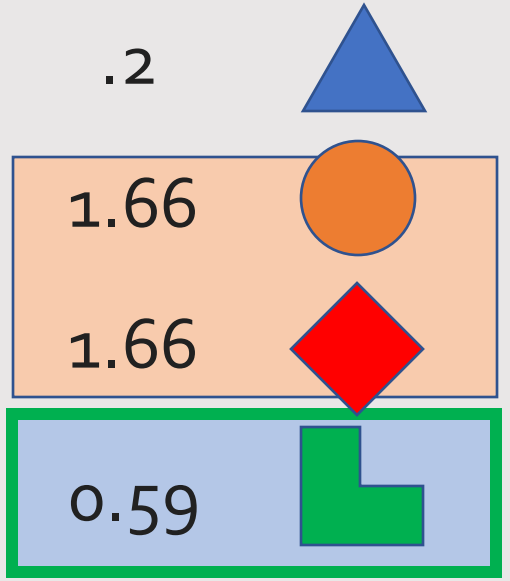
	1	0	.2	.25
	0	1	.66	.33
	.2	.66	1	.25
	.25	.33	.25	1

X

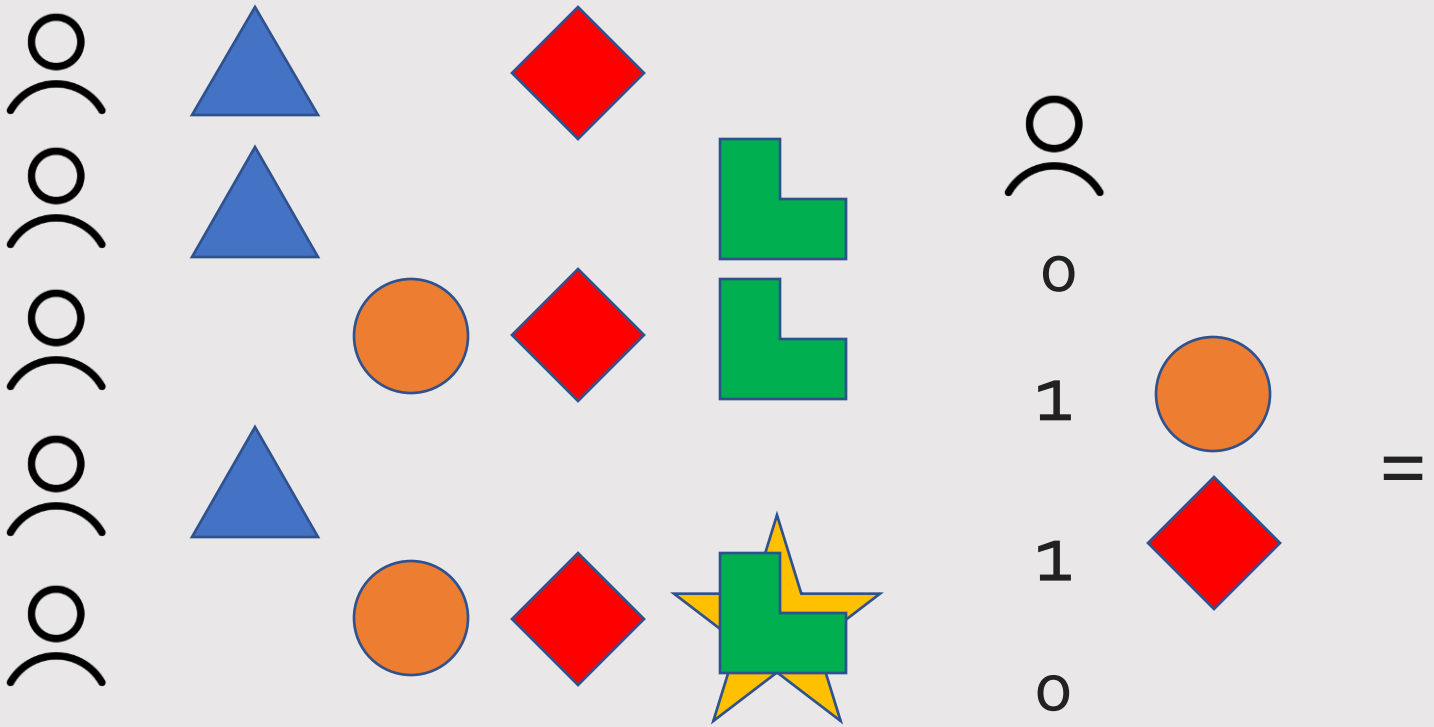


=

L Shaped is the highest rated item that the user didn't buy



It worked!



0

1

1

0

=

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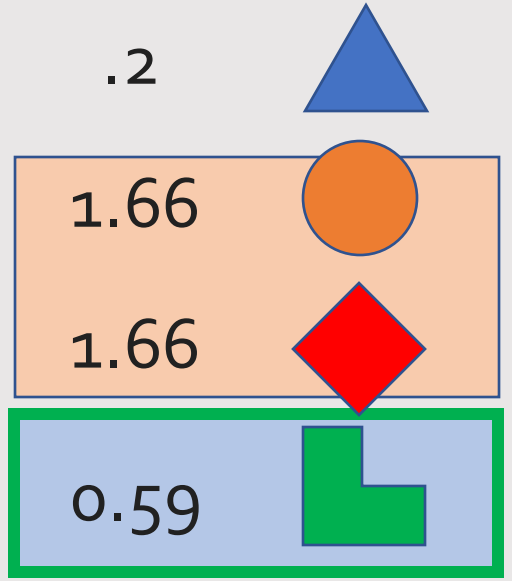

Questions?