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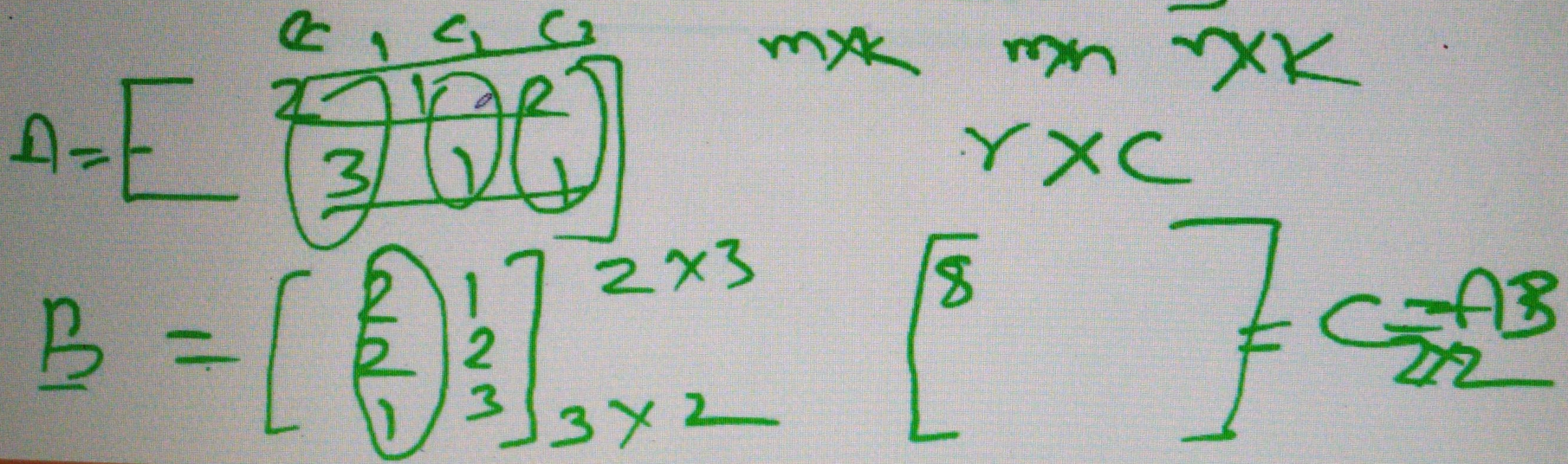

Application IV – Matrix Multiplication

- If A and B are sparse, there are several issues in matrix multiplication if A, B, and C are stored as arrays.
  - Storage /Retrieval, Compatibility of indices

0	10	12
1	0	2
0	0	0

A

2	5	0
0	1	0

B

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1	0	2
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8	0	0

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Application IV – Matrix Multiplication

- If A and B are sparse, there are several issues in matrix multiplication if A, B, and C are stored as arrays.
  - Storage /Retrieval, Compatibility of indices
- Alternate storage models for sparse matrices exist.

Row	Col	Val
1	2	10
1	3	12
2	1	1
2	3	2

Row	Col	Val
1	1	2
1	2	5
2	2	1
3	1	8

A

0	10	12
1	0	2
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B

2	5	0
0	1	0
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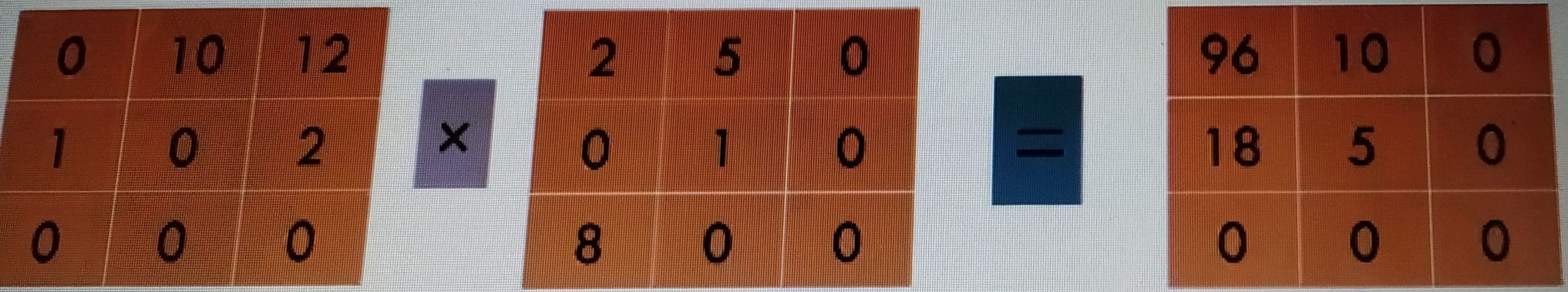
Application IV – Matrix Multiplication



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- To multiply A and B, get each row of A and each column of B multiply element-wise and sum to get one element of C.
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1	0	2
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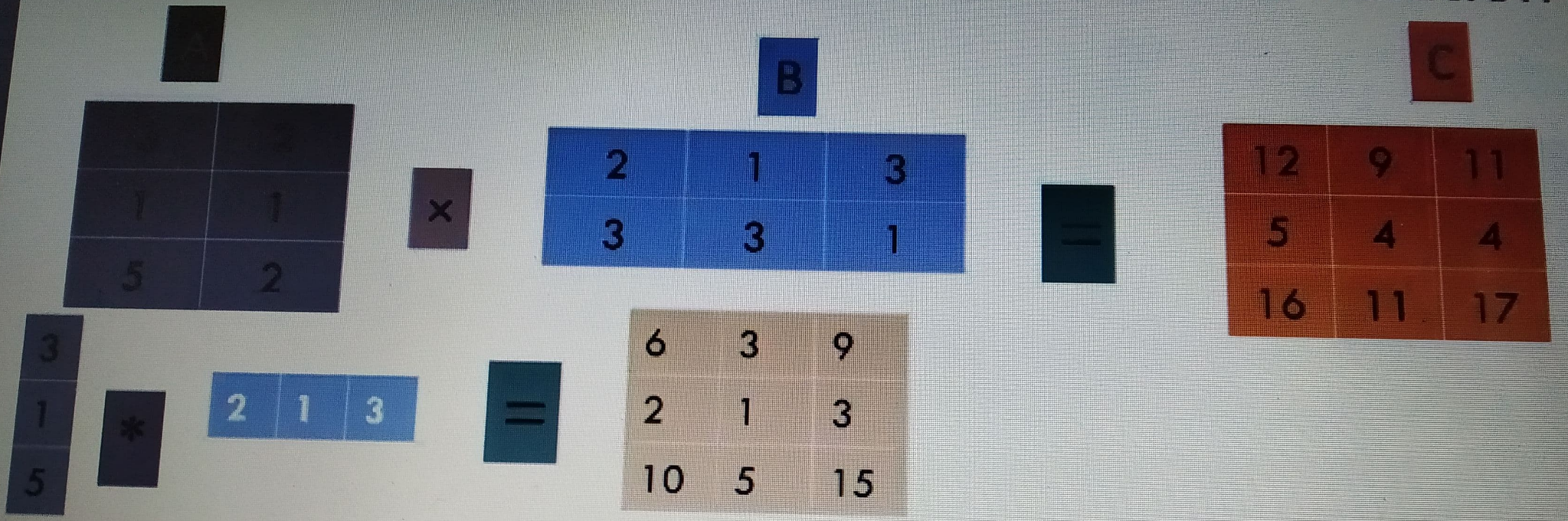
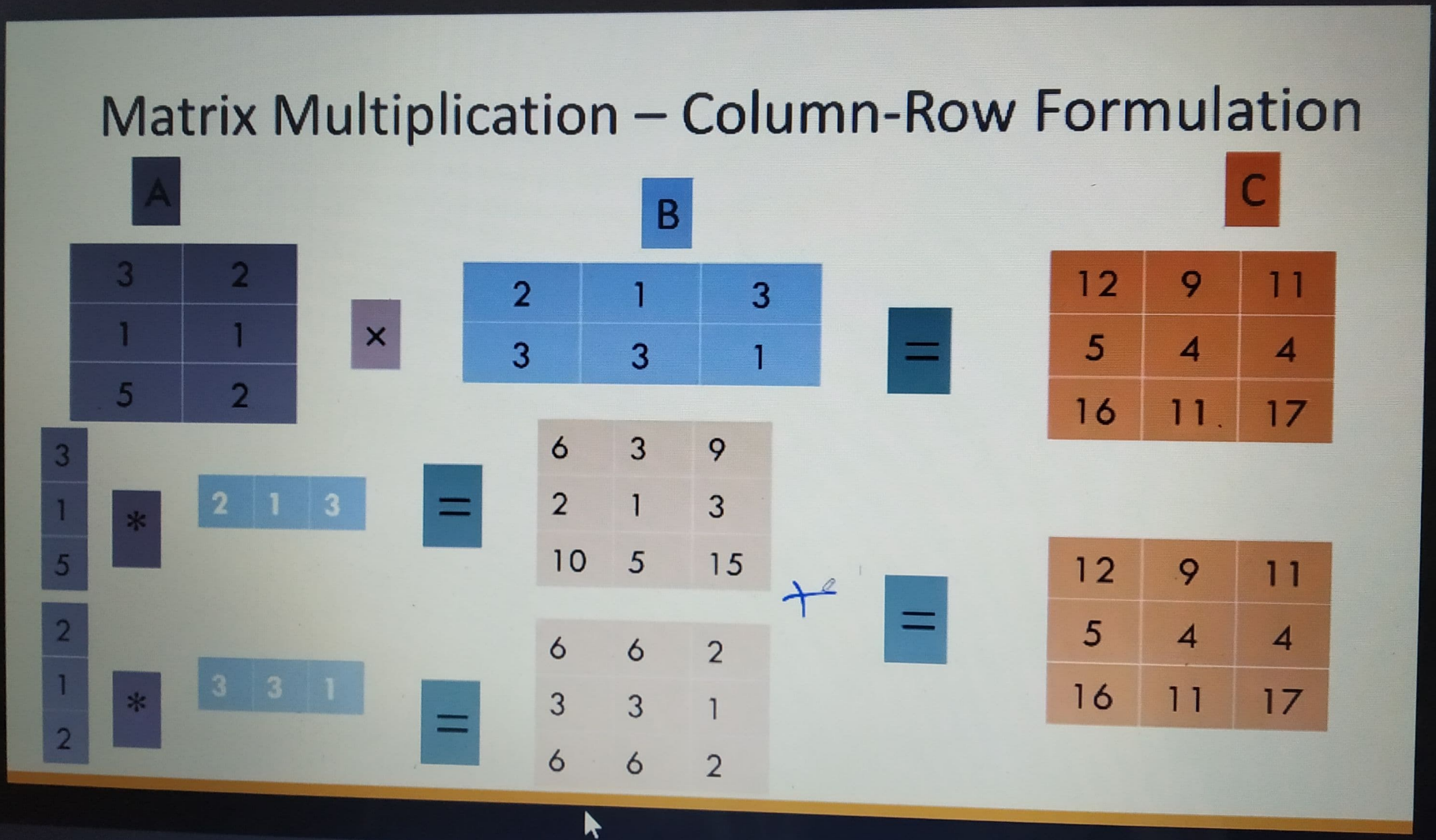
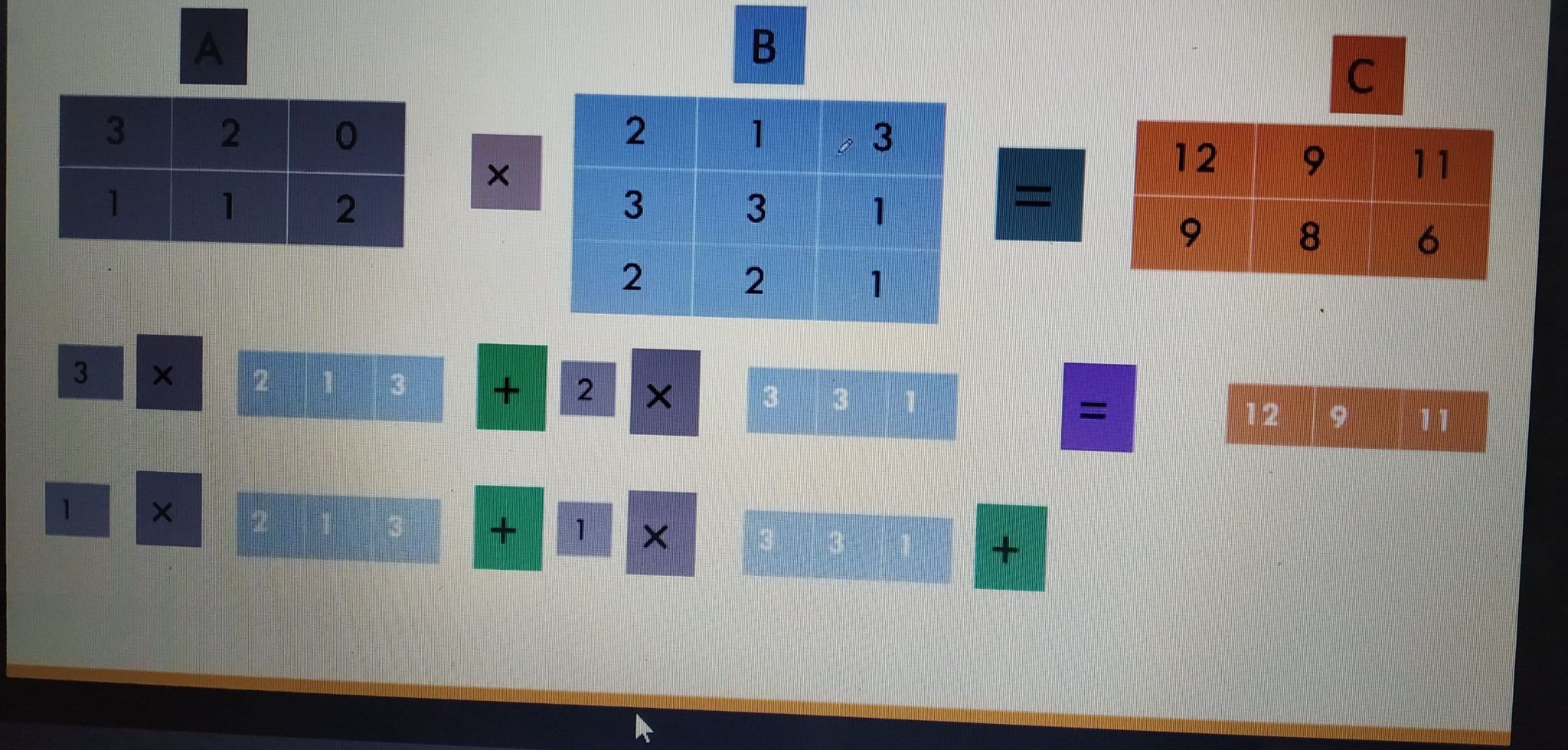
Matrix Multiplication – Column-Row Formulation



Matrix Multiplication – Column-Row Formulation



Matrix Multiplication – Row-Row Formulation



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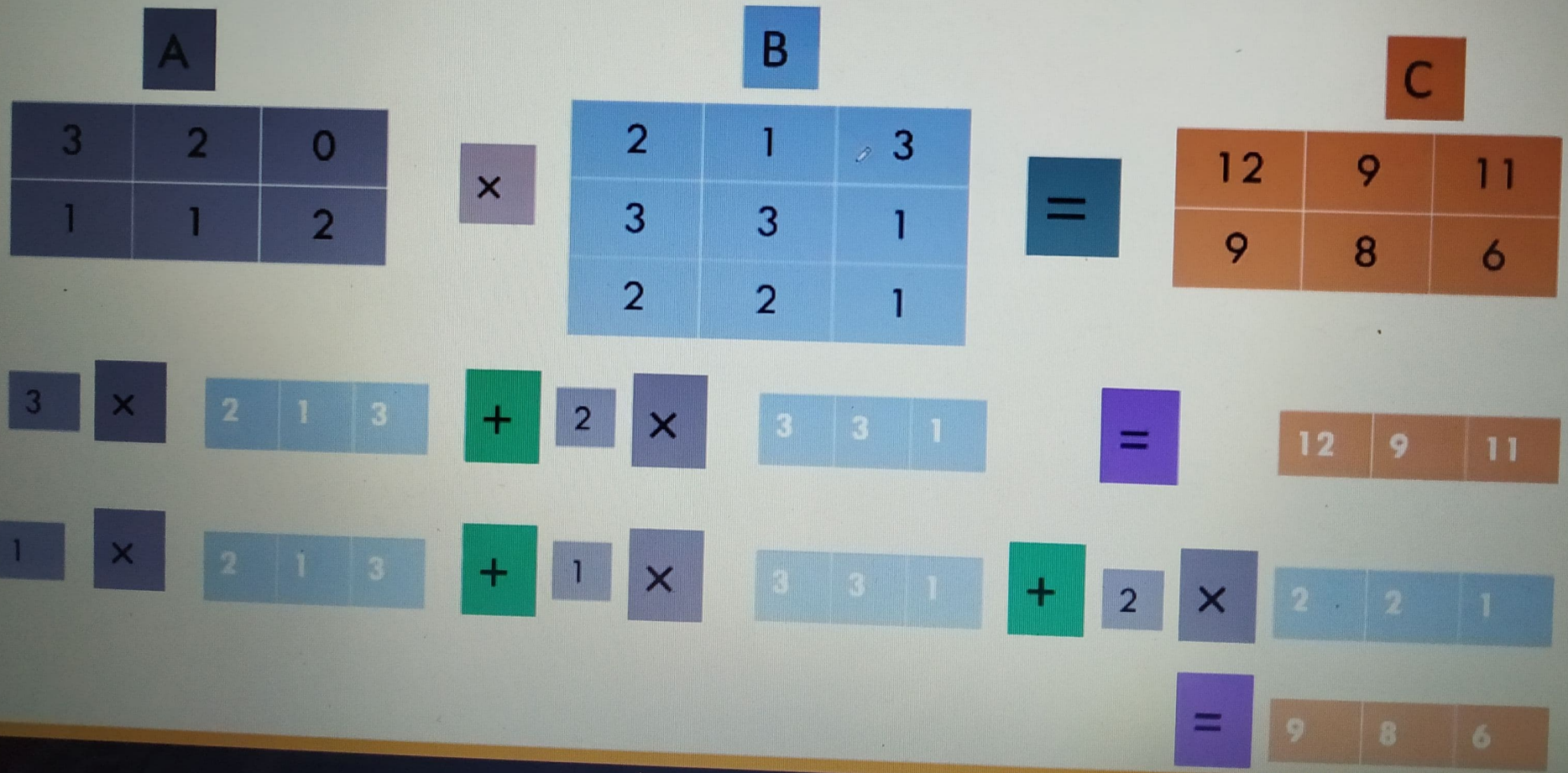
Matrix Multiplication – Row-Row Formulation



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2	3	2

Row	Col	Val
1	1	2
1	3	8
2	1	5
3	3	1

0	10	12
1	0	2
0	0	0

A

2	0	8
5	1	0
0	0	0

B^T

Meeting in "General"

47:09

Request control

Advanced Data Structures & Algorithms