

Summary for Matrices Basics

Order of matrix is
row \times column

This is 3×2

$$A = \begin{bmatrix} 3 & 5 \\ -1 & 0.4 \\ 0 & 5 \end{bmatrix}$$

Elements are the individual numbers
in the matrix.

For above matrix A , element $a_{1,2}$
is the number in row 1, column 2
so $a_{1,2} = 5$

* To add or subtract matrices must
be same dimensions

* Scalar multiplication means multiplying
a matrix by a simple number

$$\begin{aligned} \text{e.g. } 3 \times \begin{bmatrix} 2 & 5 \\ -2 & 1 \end{bmatrix} &= \begin{bmatrix} 3 \times 2 & 3 \times 5 \\ 3 \times -2 & 3 \times 1 \end{bmatrix} \\ &= \begin{bmatrix} 6 & 15 \\ -6 & 3 \end{bmatrix} \end{aligned}$$

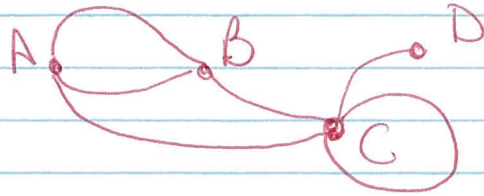
Simply \times each element by the number
out the front of matrix.

* An identity matrix
looks like \longrightarrow
only for square matrices.

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} \text{ or } \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

Representing networks in matrix form:

these show the relationships or connections between vertices.



This matrix → shows direct connections

	A	B	C	D
A	0	2	1	0
B	2	0	1	0
C	1	1	2	1
D	0	0	1	0

Matrix Multiplication

To multiply 2 matrices the following must hold true:

columns = rows of
of first second

$$\begin{bmatrix} 2 & -1 & 0 \\ 1 & 5 & 10 \end{bmatrix} \times \begin{bmatrix} 0.5 \\ 1 \\ -5 \end{bmatrix}$$



same so can multiply.

resultant matrix will be 2 x 1