Addition and Scalar Multiplication

Addition and subtraction are **element-wise**, so you simply add or subtract each corresponding element:

$$[acbd]+[wyxz]=[a+wc+yb+xd+z]$$

Subtracting Matrices:

$$[acbd]-[wyxz]=[a-wc-yb-xd-z]$$

To add or subtract two matrices, their dimensions must be **the same**.

In scalar multiplication, we simply multiply every element by the scalar value:

$$[acbd]*x=[a*xc*xb*xd*x]$$

In scalar division, we simply divide every element by the scalar value:

$$[acbd]/x=[a/xc/xb/xd/x]$$

Experiment below with the Octave/Matlab commands for matrix addition and scalar multiplication. Feel free to try out different commands. Try to write out your answers for each command before running the cell below.

```
% Initialize matrix A and B

A = [1, 2, 4; 5, 3, 2]

B = [1, 3, 4; 1, 1, 1]

% Initialize constant s

s = 2

% See how element-wise addition works

add_AB = A + B

% See how element-wise subtraction works

sub_AB = A - B

% See how scalar multiplication works

mult_As = A * s
```

```
% Divide A by s

div_As = A / s

% What happens if we have a Matrix + scalar?

add_As = A + s
```

运行重置