

# Lecture 8

## Matlab

### Array operations and Linear equations

## Array operations

MATLAB has two different types of arithmetic operations: matrix arithmetic operations and array arithmetic operations. We have seen matrix arithmetic operations in the previous lab. Now, we are interested in array operations.

### .1 Matrix arithmetic operations

As we mentioned earlier, MATLAB allows arithmetic operations: +, -, \*, and ^ to be carried out on matrices. Thus,

$A+B$  or  $B+A$  is valid if  $A$  and  $B$  are of the same size

$A*B$  is valid if  $A$ 's number of column equals  $B$ 's number of rows

$A^2$  is valid if  $A$  is square and equals  $A*A$

$\alpha*A$  or  $A*\alpha$  multiplies each element of  $A$  by  $\alpha$

#### 3.1.2 Array arithmetic operations

On the other hand, array arithmetic operations or array operations for short, are done element-by-element. The period character, ., distinguishes the array operations from the matrix operations. However, since the matrix and array operations are the same for addition (+) and subtraction (-), the character pairs (.+) and (-.) are not used. The list of array operators is shown below in Table 3.2. If  $A$  and  $B$  are two matrices of the same size with elements  $A = [a_{ij}]$  and  $B = [b_{ij}]$ , then the command.