

Array and Matrix

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Ex. 1: Basic operations: Assign the content of an array/matrix

```
a = [2 12 25];  
b = [3 7 4];  
c = a + b;
```

Ex. 2: Assign the content of a matrix: Addition of two matrices

```
a = [3 4; 1 6];  
b = [5 2; 11 7];  
c = a + b;
```

Ex. 3: Multiplication involving a scalar and an array

```
a = [3 5; 1 4];  
b = 2 * a;
```

Ex. 4: Element-by-element multiplication involving two 1-D arrays or two matrices of the same dimension

```
a = [2 3 5];  
b = [2 4 9];  
c = a.* b; % The period preceding the mathematical operation, "*", indicates that the  
           % operation will be performed element-by-element.
```

Ex. 5: Element-by-element multiplication of two matrices

```
a = [2 3; 1 4];  
b = [5 1; 7 2];  
c = a.* b;
```

Ex. 6: Direct (not element-by-element) multiplication of two matrices

```
a = [2 3; 1 4];  
b = [5 1; 7 2];  
c = a * b;
```

Ex. 7: Elementary functions with a vectorial variable

```

a = [2 3 5];
b = sin(a);

a = [2 3 5];
b = (2 * (a.^2)) + ((3 * a) + 4);

```

Ex. 8: An efficient way to assign the content of an array

```

a = [0:0.5:4]; % start at 0, increment in 0.5, stop at 4
a;

```

Ex. 9: Extracting the individual element(s) of a matrix

```

A = [3 5; 2 4];
c = A(2,2) + A(1,2);

A = [3 5; 2 4];
norm1 = 0;
for m = 1:2
    for n = 1:2
        norm1 = norm1+A(m,n)^2;
    end
end
norm1 = sqrt(norm1); % Euclidean norm of matrix 'A':
                    % The Euclidean norm of a square matrix
                    % is the square root of the sum of all the
                    % squares of the elements.

```

Ex. 10: Solving a system of linear equations

```

A = [4 1 2; 0 3 1; 0 1 2];
b = [17 ; 19 ; 13];
x = inv(A) * b; % x = [A]^-1 * b

A = [4 1 2; 0 3 1; 0 1 2];
b = [17 ; 19 ; 13];
x = A \ b; % \ = back-divide

```

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