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# Computational Intelligence Lab

## Report - Lab 1 - Prof. Amini

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### Clear recent data

```
close all; clc; clearvars;
```

### Test

```
% Report test
M = [1 0 sin(pi/4); 0 1 sin(pi/2); 1 0 1];
sigmatrix(M)
dsigmatrix(M)

% Exercise test
tanhmatrix(rand(3))
```

### Report Functions

```
% Sigmoid and dsigmoid matrix
function sigmat = sigmoid(mat)
    sigmat = (2 ./ (1 + exp(-mat))) - 1;
end

function dsigmat = dsigmoid(mat)
    dsigmat = (1 - sigmoid(mat) .^ 2) ./ 2;
end

% Sum of sigmoid and dsigmoid matrix elements
function sigsum = sigmatrix(mat)
    sigsum = sum(sigmoid(mat), 'all');
end

function dsigsum = dsigmatrix(mat)
    dsigsum = sum(dsigmoid(mat), 'all');
end

ans =
```

2.6501

*ans* =

3.9085

## Exercise Function

```
% Tanh matrix  
function tanhsum = tanhmatrix(mat)  
    tanhsum = sum((exp(mat) - exp(-mat)) ./ (exp(mat) + exp(-  
mat)), 'all');  
end
```

*ans* =

3.4664

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