

Given $x = [3 \ 1 \ 5 \ 7 \ 9 \ 2 \ 6]$, explain what the following commands do by summarizing the net result of the command.

(i) $x(3)$

(v) $x(6:-2:1)$

(ii) $x(1:5)$

(vi) $x([1 \ 6 \ 2 \ 1 \ 1])$

(iii) $x(1:end)$

(vii) $\text{sum}(x)$

(iv) $x(1:end-1)$

(viii) $\text{sort}(x)$

Given the array $A = [2 \ 6 \ 9 \ 7 ; 3 \ 1 \ 4 \ 6 ; 5 \ 3 \ 2 \ 7]$, explain the results of the following commands:

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|--------------------------------|---------------------------------|
| (i) A' | (viii) $[A \ A(\text{end}, :)]$ |
| (ii) $A(:, [1 \ 4])$ | (ix) $A(1:3, :)$ |
| (iii) $A([2 \ 3], [3 \ 1])$ | (x) $[A ; A(1:2, :)]$ |
| (iv) $\text{reshape}(A, 2, 6)$ | (xi) $\text{sum}(A)$ |
| (v) $A(:)$ | (xii) $\text{sum}(A')$ |
| (vi) $\text{flipud}(A)$ | (xiii) $\text{sum}(A, 2)$ |
| (vii) $\text{fliplr}(A)$ | |

$$A = \begin{pmatrix} 1 & 5 & 7 \\ 4 & -2 & 9 \\ 3 & 1 & 4 \end{pmatrix} \quad B = \begin{pmatrix} 1 & 3 & 5 \\ 1 & 0 & 3 \\ 2 & 7 & -1 \end{pmatrix}$$

$$C = \begin{pmatrix} 1 & 2 & 2 \\ 3 & 1 & 3 \end{pmatrix} \quad D = \begin{pmatrix} 1 & 5 \\ -1 & 3 \\ 2 & -2 \end{pmatrix}$$

The logistic function

$$f(x) = \frac{1}{1 + e^{-x}}$$

The tanh function

$$f(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}$$

The standardization function:

$$f(x_i) = \frac{x_i - \bar{x}}{s_x}$$

The normalization function:

$$f(x_i) = \frac{x_i - \min(x)}{\max(x) - \min(x)}$$

Statistics Functions

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julia> using StatsBase, StatsFuns, StreamStats
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|----------------|------------------------------|-------------------|
| (i) mean(X) | (vi) skewness(X) | (x) minimum(X) |
| (ii) median(X) | (vii) kurtosis(X) | (xi) findmax(X) |
| (iii) var(X) | (viii) mode(X) /
modes(X) | (xii) quantile(X) |
| (iv) std(X) | | (xiii) cov(X,Y) |
| (v) iqr(X) | (ix) maximum(X) | (xiv) cor(X,Y) |