**poly**

*Function of calculating characteristic polynomial of real matrix.*

**Syntax:**

*X* = **poly**(*M*);

**Arguments:**

*M* – input matrix.

**Description:**

*poly(M)* – function returns array of coefficients of characteristic polynomial of matrix *М*. Matrix *M* shall be square and feature real elements.

Input matrix *М* can be assigned:

* as variable of matrix type determined earlier:

*X* = **poly**(*M*);

* as matrix consisting of variables determined earlier:

*X* = **poly**([[*x1,x2*],[*x3,x4*],[*x5,x6*]]);

* as constant array:

*X* = **poly**([[1,2],[3,4],[5,6]]);

**Result:**

*X* – output array comprising coefficients of characteristic polynomial of matrix *М*:

a0+a1x+a2x2+…+anxn

**Example:**

|  |  |
| --- | --- |
|  | **const**M = [[1, -3, 4], [4, -7, 8], [6, -7, 7]];  X = **poly**(M); //[3,5, 1, -1] |

As a result, elements of array *X* will be assigned values [3, 5, 1, -1] being the roots of characteristic polynomial 3 + 5x + x2 - x3 of real matrix *M*.