**cspline**

*Function of calculating matrix of coefficients for cubic spline interpolation to specified coordinates.*

**Syntax:**

*M* = **cspline**(*X*, *Y*);

**Arguments:**

*Х* – input array of coordinates along x axis for calculating matrix of coefficients,

*Y* – input array of coordinates along y axis for calculating matrix of coefficients.

**Description:**

Function calculates a matrix of coefficients for cubic spline interpolation to specified coordinates of points. The calculated matrix of coefficients is used by *interpol* function for spline interpolation of argument *x*.

Input arrays X and Y shall be of the same size.

Input arrays X, Y can be assigned:

* as variables of array type determined earlier:

*M* = **cspline**(*X*, *Y*);

* as variables of array type consisting of variables of *double* type determined earlier:

*M* = **cspline**([*x1,x2,x3,x4*],[*y1,y2,y3,y4*]);

*M* = **cspline**([*x1,x2,x3,x4*],*Y*);

*M* = **cspline**(*X*,[*y1,y2,y3,y4*]);

* as constant arrays:

*M* = **cspline**([-1.80,-1.60,-1.40,-1.20],*Y*);

*M* = **cspline**(*X*,[-1.80,-1.60,-1.40,-1.20]);

*M* = **cspline**([-1.80,-1.60,-1.40,-1.20],[-1.40,-0.78,-0.53,-0.35]);

**Result:**

*M* – calculated matrix of coefficients.

**Example:**

|  |  |
| --- | --- |
|  | **input** Q;//input - argument  **output** n;//output – result of cubic spline interpolation  //arrays of coordinates for matrix calculation  **const** Qpts=[-2.00, -1.80, -1.60, -1.40, -1.20,  -1.00, -0.80, -0.60, -0.40, -0.20,  0.00,0.20,0.40,0.60,0.80,  1.00,1.20,1.40,1.60,1.80,2.00];  **const** Hp = [-1.40,-0.78,-0.53,-0.35,-0.17,  +0.05,+0.38,+0.80,+0.94,+1.07,  1.15,1.26,1.33,1.40,1.47,  1.40,1.45,1.51,1.59,1.69,1.74];  Mn=**cspline**(Qpts,Hp);  N=**interpol**(Q,Mn); |

As a result, variable n will be assigned interpolated value of head pressure (by Hp and Qpts arrays) in accordance with consumption Q values.