eltype() — Element type, organizational type, and type name of object

Description

eltype() returns the current eltype of the argument.

orgtype() returns the current orgtype of the argument.

classname() returns the name of the class for a Mata class scalar.

structname() returns the name of the struct for a Mata struct scalar.


Syntax

\[
\begin{align*}
\text{string scalar} & \quad \text{eltype}(X) \\
\text{string scalar} & \quad \text{orgtype}(X) \\
\text{string scalar} & \quad \text{classname}(X) \\
\text{string scalar} & \quad \text{structname}(X)
\end{align*}
\]

Remarks and examples

If \( X \) is a matrix (syntax 1), returned is

\[
\begin{array}{ccc}
\text{eltype}(X) & \text{orgtype}(X) \\
\text{real} & \text{scalar} \\
\text{complex} & \text{rowvector} \\
\text{string} & \text{colvector} \\
\text{pointer} & \text{matrix} \\
\text{struct} & \\
\text{class} & \\
\end{array}
\]

The returned value reflects the current contents of \( X \). That is, \( X \) might be declared a transmorphic matrix, but at any instant, it contains something, and if that something were 5, returned would be "real" and "scalar".

For orgtype(), returned is "scalar" if the object is currently \( 1 \times 1 \); "rowvector" if it is \( 1 \times k, k \neq 1 \); "colvector" if it is \( k \times 1, k \neq 1 \); and "matrix" otherwise (it is \( r \times c, r \neq 1, c \neq 1 \)).
X can be a function (syntax 2). Returned is

<table>
<thead>
<tr>
<th>eltype(*(&amp;func() ))</th>
<th>orgtype(*(&amp;func()))</th>
</tr>
</thead>
<tbody>
<tr>
<td>transmorphic</td>
<td>matrix</td>
</tr>
<tr>
<td>numeric</td>
<td>vector</td>
</tr>
<tr>
<td>real</td>
<td>rowvector</td>
</tr>
<tr>
<td>complex</td>
<td>colvector</td>
</tr>
<tr>
<td>string</td>
<td>scalar</td>
</tr>
<tr>
<td>pointer</td>
<td>void</td>
</tr>
<tr>
<td>struct</td>
<td></td>
</tr>
<tr>
<td>structdef</td>
<td></td>
</tr>
<tr>
<td>class</td>
<td></td>
</tr>
<tr>
<td>classdef</td>
<td></td>
</tr>
</tbody>
</table>

These types are obtained from the declaration of the function.

Aside: struct and structdef have to do with structures; see [M-2] struct. structdef indicates that the function not only returns a structure but is the routine that defines the structure as well. class and classdef have to do with Mata classes; see [M-2] class. classdef indicates the function not only returns a class but is the routine that defines the class as well.

classname() returns the name "cA" if the object is a class cA scalar. The function returns "" if the object has element type other than class or has organizational type other than scalar.

structname() returns the name "sA" if the object is a struct sA scalar. The function returns "" if the object has element type other than struct or has organizational type other than scalar.

**Conformability**

eltype(X), orgtype(X), classname(X), structname(X):

\[
\begin{align*}
X & : r \times c \\
result & : 1 \times 1
\end{align*}
\]

**Diagnostics**

None.

**Also see**

[M-5] isreal() — Storage type of matrix

[M-5] isview() — Whether matrix is view

[M-4] Utility — Matrix utility functions