**Syntax**

\[ y = f(x, \ldots) \]  
(function returns result the usual way)

\[ g(x, \ldots, y) \]  
(function returns result in argument \( y \))

**Description**

Most Mata functions leave their arguments unchanged and return a result:

\[ : y = f(x, \ldots) \]

Some Mata functions, however, return nothing and instead return results in one or more arguments:

\[ : g(x, \ldots, y) \]

If you use such functions interactively and the arguments that are to receive results are not already defined (\( y \) in the above example), you will get a variable-not-found error. The solution is to define the arguments to contain something—anything—before calling the function:

\[ : y = . \]
\[ : g(x, \ldots, y) \]

You can combine this into one statement:

\[ : g(x, \ldots, y=.) \]

**Remarks and examples**

\texttt{sqrt(a)}—see [M-5] \texttt{sqrt()}—calculates the (element-by-element) square root of \( a \) and returns the result:

\[ : x = 4 \]
\[ : y = \text{sqrt}(x) \]
\[ : y \]
\[ \quad // y \text{ now contains 2} \]
\[ 2 \]
\[ : x \]
\[ \quad // x \text{ is unchanged} \]
\[ 4 \]

Most functions work like \texttt{sqrt()}, although many take more than one argument.

On the other hand, \texttt{polydiv(c_a, c_b, c_q, c_r)}—see [M-5] \texttt{polyeval()}—takes the polynomial stored in \( c_a \) and the polynomial stored in \( c_b \) and divides them. It returns the quotient in the third argument \( c_q \) and the remainder in the fourth \( c_r \). \( c_a \) and \( c_b \) are left unchanged. The function itself returns nothing:

\[ : A = (1,2,3) \]
\[ : B = (0,1) \]
\[ : \text{polydiv}(A, B, Q, R) \]
As another example, `st_view(V, i, j)`—see [M-5] `st_view()`—creates a view onto the Stata dataset. Views are like matrices but consume less memory. Arguments `i` and `j` specify the observations and variables to be selected. Rather than returning the matrix, however, the result is returned in the first argument (`V`).

```stata
: st_view(V, (1\5), ("mpg", "weight"))
: V
   1  2
1  22 2930
2  15 4080
```

If you try to use these functions interactively, you will probably get an error:

```stata
: polydiv(A, B, Q, R)
   <istmt>:  3499  Q not found
   r(3499);
: st_view(V, (1\5), ("mpg", "weight"))
   <istmt>:  3499  V not found
   r(3499);
```

Arguments must be defined before they are used, even if their only purpose is to receive a newly calculated result. In such cases, it does not matter how the argument is defined because its contents will be replaced. Easiest is to fill in a missing value:

```stata
: Q = .
: R = .
: polydiv(A, B, Q, R)
: V = .
: st_view(V, (1\5), ("mpg", "weight"))
```

You can also define the argument inside the function:

```stata
: polydiv(A, B, Q=., R=.)
: st_view(V=., (1\5), ("mpg", "weight"))
```

When you use functions like these inside a program, however, you need not worry about defining the arguments, because they are defined by virtue of appearing in your program:
function foo()
{
    ...
    polydiv(A, B, Q, R)
    st_view(V, (1\5), ("mpg", "weight"))
    ...
}

When Mata compiles your program, however, you may see warning messages:

: function foo()
  > {
  >   ...
  >   polydiv(A, B, Q, R)
  >   st_view(V, (1\5), ("mpg", "weight"))
  >   ...
  > }
  note: variable Q may be used before set
  note: variable R may be used before set
  note: variable V may be used before set

If the warning messages bother you, either define the variables before they are used just as you would interactively or use pragma to suppress the warning messages; see [M-2] pragma.

Also see

[M-1] intro — Introduction and advice