

## Description

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

```
: y = f(x, ...)
```

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

```
: g(x, ..., 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, ..., y)
```

You can combine this into one statement:

```
: g(x, ..., y=.)
```

## Syntax

$y = f(x, \dots)$  (function returns result the usual way)

$g(x, \dots, y)$  (function returns result in argument  $y$ )

## Remarks and examples

`sqrt( $a$ )`—see [M-5] `sqrt()`—calculates the (element-by-element) square root of  $a$  and returns the result:

```
: x = 4
: y = sqrt(x)
: y           // y now contains 2
  2
: x           // x is unchanged
  4
```

Most functions work like `sqrt()`, although many take more than one argument.

On the other hand, `polydiv( $c_a, c_b, c_q, c_r$ )`—see [M-5] `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)
: polydiv(A, B, Q, R)
: Q           // Q has been redefined
      1  2
1  

|   |   |
|---|---|
| 2 | 3 |
|---|---|



: R           // as has R
1

: A           // while A and B are unchanged
      1  2  3
1  

|   |   |   |
|---|---|---|
| 1 | 2 | 3 |
|---|---|---|



: B
      1  2
1  

|   |   |
|---|---|
| 0 | 1 |
|---|---|


```

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*).

```

: st_view(V, (1\5), ("mpg", "weight"))
: V
      1  2
1  

|    |      |
|----|------|
| 22 | 2930 |
| 15 | 4080 |


2

```

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

```

: 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:

```

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

```

You can also define the argument inside the function:

```

: 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

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