

# range() — Vector over specified range

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## Description

`range(a, b, delta)` returns a column vector going from  $a$  to  $b$  in steps of  $\text{abs}(\text{delta})$  ( $b \geq a$ ) or  $-\text{abs}(\text{delta})$  ( $b < a$ ).

`rangen(a, b, n)` returns a  $\text{round}(n) \times 1$  column vector going from  $a$  to  $b$  in  $\text{round}(n)-1$  steps.  $a$  may be less than, equal to, or greater than  $b$ .

## Syntax

*numeric colvector* `range(a, b, numeric scalar delta)`

*numeric colvector* `rangen(a, b, real scalar n)`

where  $a$  and  $b$  are numeric scalars.

## Remarks and examples

`range(0, 1, .25)` returns  $(0 \setminus .25 \setminus .5 \setminus .75 \setminus 1)$ . The sign of the third argument does not matter; `range(0, 1, -.25)` returns the same thing. `range(1, 0, .25)` and `range(1, 0, -.25)` return  $(1 \setminus .75 \setminus .5 \setminus .25 \setminus 0)$ .

`rangen(0, .5, 6)` returns  $(0 \setminus .1 \setminus .2 \setminus .3 \setminus .4 \setminus .5)$ . `rangen(.5, 0, 6)` returns  $(.5 \setminus .4 \setminus .3 \setminus .2 \setminus .1 \setminus 0)$ .

`range()` and `rangen()` may be used with complex arguments. `range(1, 1i, .4)` returns  $(1 \setminus .75+.25i \setminus .5+.5i \setminus .25+.75i \setminus 1i)$ . `rangen(1, 1i, 5)` returns the same thing. For `range()`, only the distance of  $\text{delta}$  from zero matters, so `range(1, 1i, .4i)` would produce the same result, as would `range(1, 1i, .25+.312i)`.

## Conformability

`range(a, b, delta):`

*a:*  $1 \times 1$

*b:*  $1 \times 1$

*delta:*  $1 \times 1$

*result:*  $1 \times 1$ , if  $a = b$

$\max(1+\text{abs}(b-a)/\text{abs}(\text{delta}), 2) \times 1$ , otherwise

```
rangen(a, b, n):  
  a:      1 × 1  
  b:      1 × 1  
  n:      n × 1  
  result: round(n) × 1
```

## Diagnostics

`range(a, b, delta)` aborts with error if *a*, *b*, or *delta* contains missing, if  $\text{abs}(b-a)/\text{abs}(delta)$  results in overflow, or if  $1+\text{abs}(b-a)/\text{abs}(delta)$  results in a vector that is too big given the amount of memory available.

`range(a, b, delta)` returns a  $1 \times 1$  result when  $a = b$ . In all other cases, the result is  $2 \times 1$  or longer.

`rangen(a, b, n)` aborts with error if `round(n)` is less than 0 or missing.

## Also see

[M-4] [Standard](#) — Functions to create standard matrices

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