linspace

Generate linearly spaced vector

Syntax

```
y = linspace(x1,x2)
y = linspace(x1,x2,n)
```

Description

`y = linspace(x1,x2)` returns a row vector of 100 evenly spaced points between `x1` and `x2`. example

`y = linspace(x1,x2,n)` generates n points. The spacing between the points is `(x2-x1)/(n-1)`. example

`linspace` is similar to the colon operator, "`:`", but gives direct control over the number of points and always includes the endpoints. "`lin`" in the name "`linspace`" refers to generating linearly spaced values as opposed to the sibling function `logspace`, which generates logarithmically spaced values.

Examples

collapse all

Vector of Evenly Spaced Numbers

Create a vector of 100 evenly spaced points in the interval `[-5,5]`.

Try This Example

```
y = linspace(-5,5);
```

Vector with Specified Number of Values

Create a vector of 7 evenly spaced points in the interval `[-5,5]`.

Try This Example

```
y1 = linspace(-5,5,7)
```

```
y1 =

   -5.0000   -3.3333   -1.6667         0    1.6667    3.3333    5.0000
```

Vector of Evenly Spaced Complex Numbers

Create a vector of complex numbers with 8 evenly

spaced points between `1+2i` and `10+10i`.

Try This Example

```
y = linspace(1+2i,10+10i,8)
```

```
y =
  Columns 1 through 4

   1.0000 + 2.0000i   2.2857 + 3.1429i   3.5714 + 4.2857i   4.8571 + 5.4286i

  Columns 5 through 8

   6.1429 + 6.5714i   7.4286 + 7.7143i   8.7143 + 8.8571i  10.0000 +10.0000i
```

Input Arguments

collapse all

`x1, x2` — Point interval
pair of numeric scalars

Point interval, specified as a pair of numeric scalars. `x1` and `x2` define the interval over which `linspace` generates points. `x1` and `x2` can be real or complex, and `x2` can be either larger or smaller than `x1`. If `x2` is smaller than `x1`, then the vector contains descending values.

Data Types: `single` | `double` | `datetime` | `duration`
Complex Number Support: Yes

`n` — Number of points
100 (default) | real numeric scalar

Number of points, specified as a real numeric scalar.

- If n is `1`, `linspace` returns `x2`.
- If n is zero or negative, `linspace` returns an empty 1-by-0 matrix.
- If n is not an integer, `linspace` rounds down and returns `floor(n)` points.

Extended Capabilities

C/C++ Code Generation
Generate C and C++ code using MATLAB® Coder™.

See Also

`colon` | `logspace`

Introduced before R2006a