mvnrnd

Multivariate normal random numbers

Syntax

```
R = mvnrnd(MU,SIGMA)
r = mvnrnd(MU,SIGMA,cases)
```

Description

`R = mvnrnd(MU,SIGMA)` returns an *n*-by-*d* matrix `R` of random vectors chosen from the multivariate normal distribution with mean `MU`, and covariance `SIGMA`. `MU` is a vector or *n*-by-*d* matrix, and `mvnrnd` generates each row of `R` using the corresponding row of `mu`. `SIGMA` is a *d*-by-*d* symmetric positive semi-definite matrix, or a *d*-by-*d*-by-*n* array. If `SIGMA` is an array, `mvnrnd` generates each row of `R` using the corresponding page of `SIGMA`, i.e., `mvnrnd` computes `R(i,:)` using `MU(i,:)` and `SIGMA(:,:,i)`. If the covariance matrix is diagonal, containing variances along the diagonal and zero covariances off the diagonal, `SIGMA` may also be specified as a 1-by-*d* vector or a 1-by-*d*-by-*n* array, containing just the diagonal. If `MU` is a 1-by-*d* vector, `mvnrnd` replicates it to match the trailing dimension of `SIGMA`.

`r = mvnrnd(MU,SIGMA,cases)` returns a `cases`-by-*d* matrix `R` of random vectors chosen from the multivariate normal distribution with a common 1-by-d mean vector `MU`, and a common d-by-d covariance matrix `SIGMA`.

Examples

collapse all

Generate Multivariate Normal Random Numbers

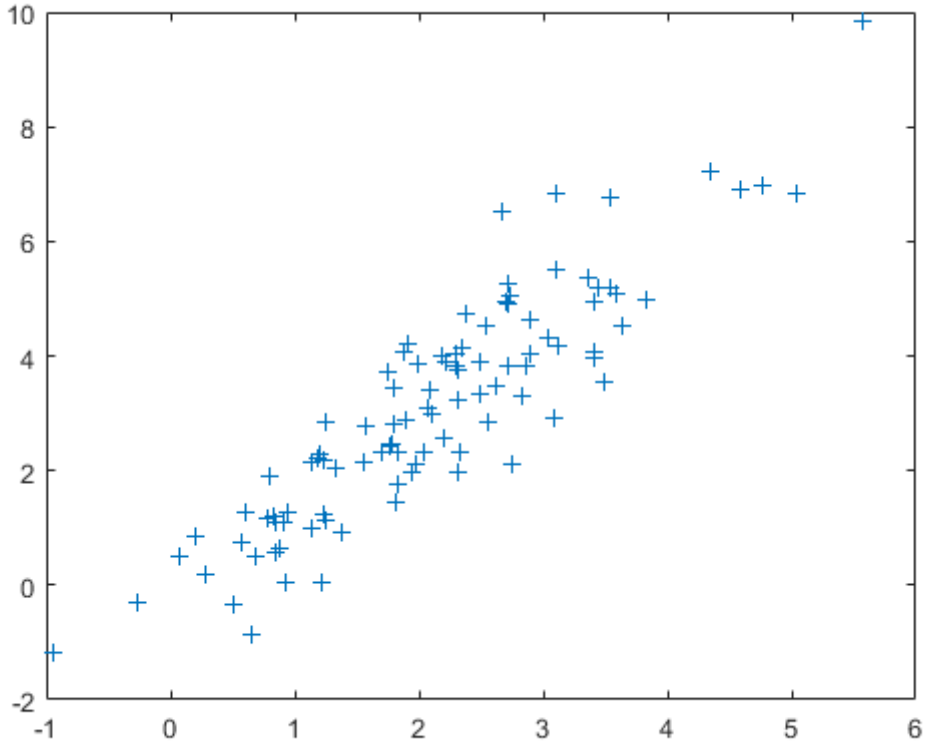
Generate random numbers from a multivariate normal distribution with parameters `mu = [2,3]` and `sigma = [1,1.5;1.5,3]`.

Open This Example

```
mu = [2,3];
sigma = [1,1.5;1.5,3];
rng default  % For reproducibility
r = mvnrnd(mu,sigma,100);
```

Plot the random numbers.

```
figure
plot(r(:,1),r(:,2),'+')
```



More About

- Multivariate Normal Distribution

See Also

`mvncdf` | `mvnpdf` | `normrnd`

Introduced before R2006a