

R in multivariatna normalna porazdelitev

A. Blejec

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Povzetek

Opisanih je nekaj primerov za uporabo funkcij v zvezi z multivariatno normalno porazdelitvijo.

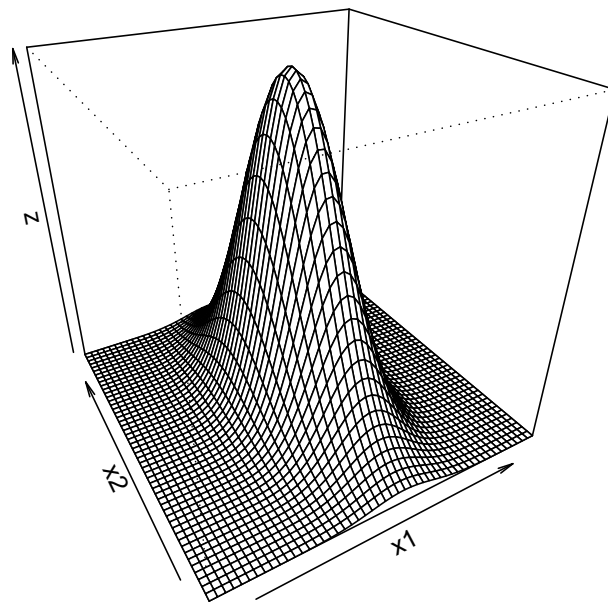
1 Paket mvtnorm

Paket **mvtnorm** vsebuje funkcije, s katerimi lahko obvladamo osnovne štiri naloge v zvezi z multivariatno normalno on multivariatno t porazdelitvijo.

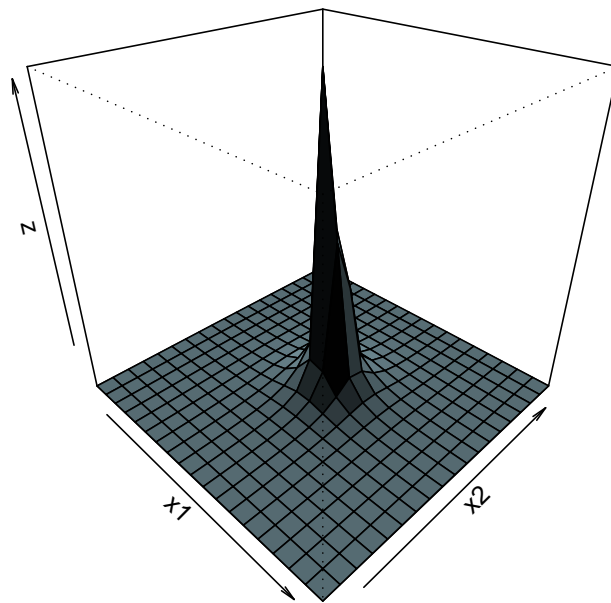
```
> library(mvtnorm)
```

1.1 Bivariatna normalna porazdelitev

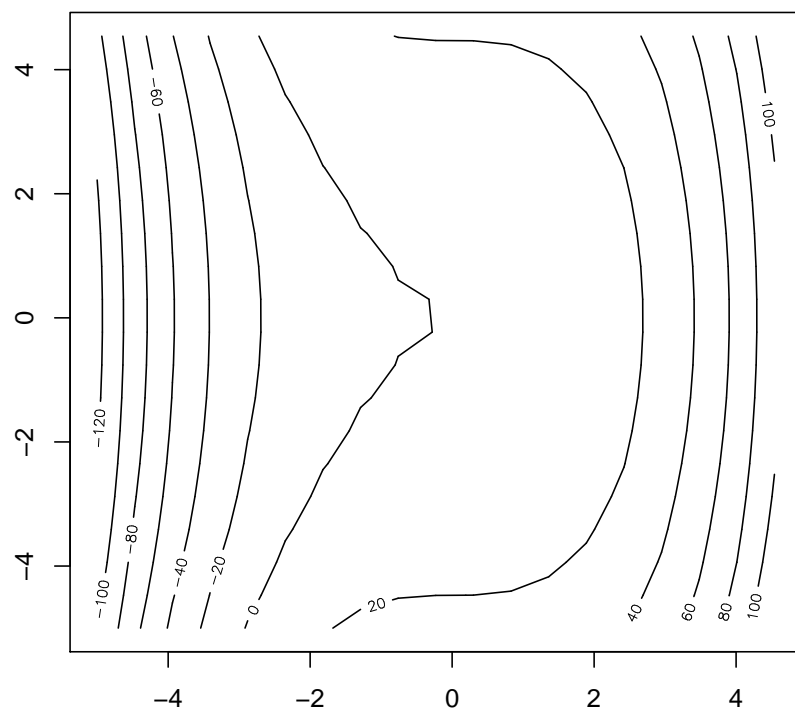
```
> n <- 2
> dx <- 0.2
> mu <- rep(0, n)
> sigma <- diag(n)
> sigma <- matrix(c(1, -0.3, -0.3, 4), ncol = n)
> x1 <- seq(-5, 5, dx)
> x2 <- seq(-5, 5, dx)
> x <- expand.grid(x1 = x1, x2 = x2)
> z <- matrix(dmvnorm(x, mu, sigma), nrow = length(x1),
+           ncol = length(x2))
> for (i in seq(-30, 30, 5)) persp(x1, x2, z, phi = 30,
+           theta = i)
```



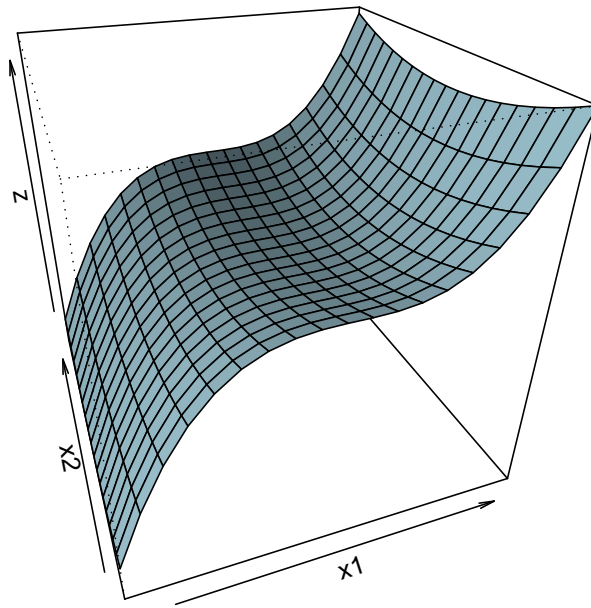
```
> dx = 0.53321
> x1 <- seq(-5, 5, dx)
> x2 <- seq(-5, 5, dx)
> X <- expand.grid(x = x1, y = x2)
> z = with(X, matrix(1/(x^2 + y^2), nrow = length(x1),
+   ncol = length(x2)))
> persp(x1, x2, z, phi = 30, theta = 45, col = "lightblue",
+   shade = 1)
```



```
> dx = 0.53  
> x1 <- seq(-5, 5, dx)  
> x2 <- seq(-5, 5, dx)  
> X <- expand.grid(x = x1, y = x2)  
> z = with(X, matrix(x^3 + y^2, nrow = length(x1), ncol = length(x2)))  
> contour(x1, x2, z)
```



```
> persp(x1, x2, z, phi = 30, theta = 340, col = "lightblue",
+       shade = 1)
```



```
> library(fields)
```

```
Package 'spam' is loaded. Version 0.13-2 (2008-01-04).
```

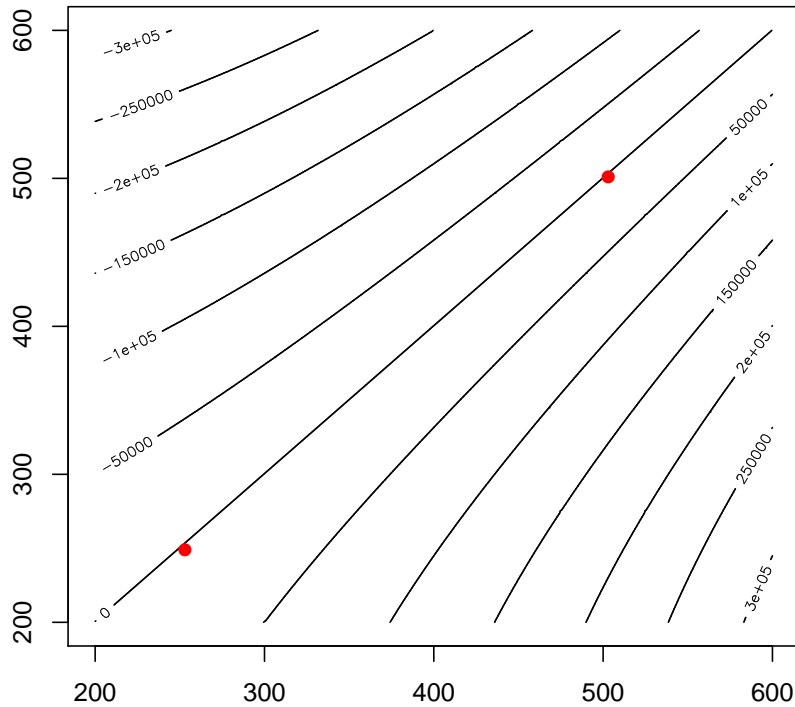
```
Type demo( spam) for some demos,  
help( Spam) for an overview of this package.
```

```
Try help(fields) for an overview of this library
```

```

> dx = 1
> x1 <- seq(200, 600, dx)
> x2 <- seq(200, 600, dx)
> X <- expand.grid(x = x1, y = x2)
> pari <- with(X, which((x^2 - y^2) == 2008))
> pari <- X[pari, ]
> z <- with(X, matrix(x^2 - y^2, nrow = length(x1), ncol = length(x2)))
> contour(x1, x2, z)
> points(pari, col = "red", pch = 16)

```



```

> dx = 20
> x1 <- seq(200, 600, dx)
> x2 <- seq(200, 600, dx)
> X <- expand.grid(x = x1, y = x2)
> z <- with(X, matrix(x^2 - y^2, nrow = length(x1), ncol = length(x2)))
> pm <- drape.plot(x1, x2, z, phi = 30, theta = -60, shade = 0.1,
+   col = terrain.colors(128))
> pushpin(pari[, 1], pari[, 2], 2008, pm, text = apply(pari,
+   1, paste, collapse = " , "), col = "red", height = 0.1,
+   cex = 1)

```

