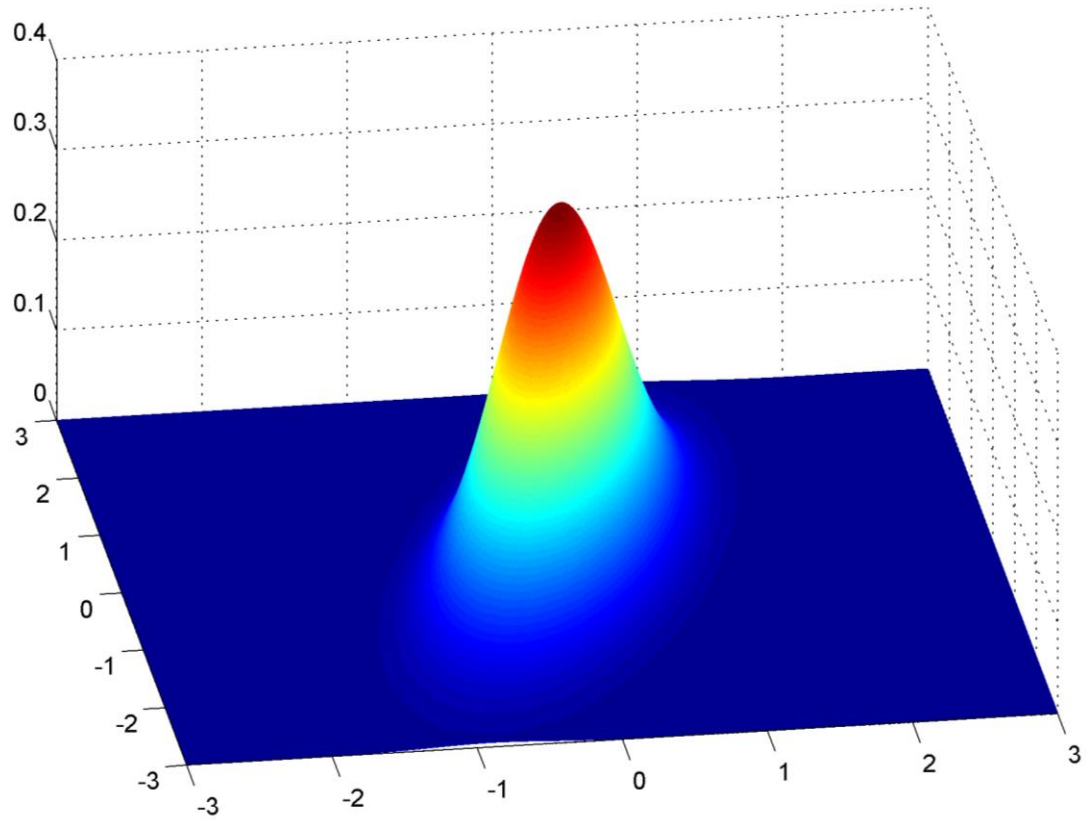
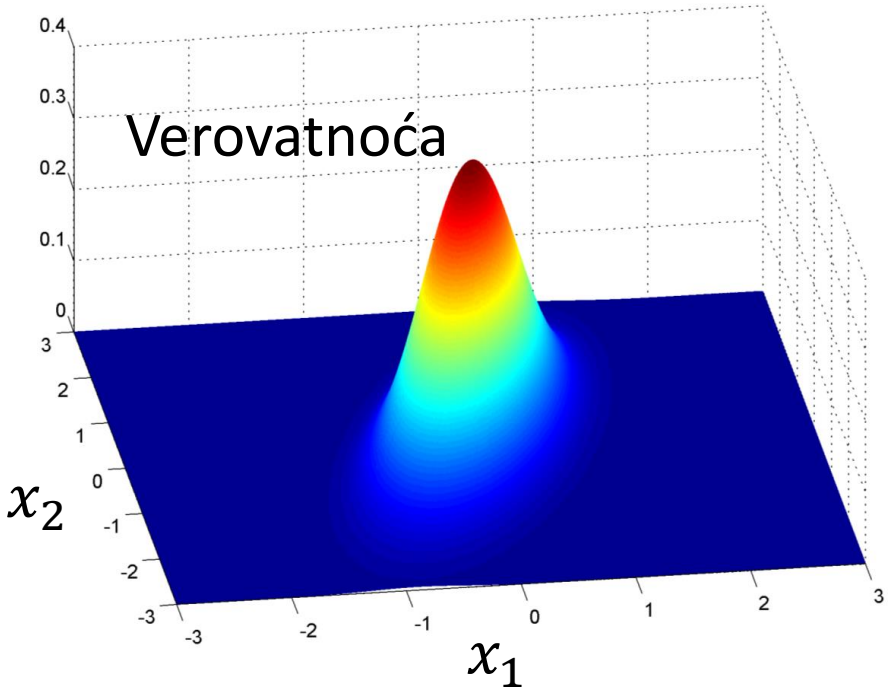
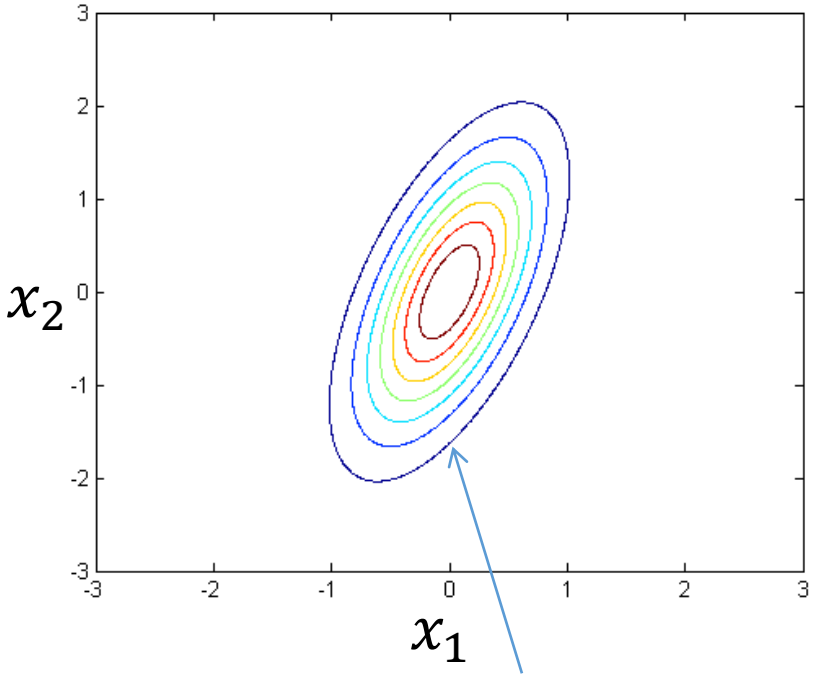


Parametri Gausove distribucije

Multivariate Gaussian 2D

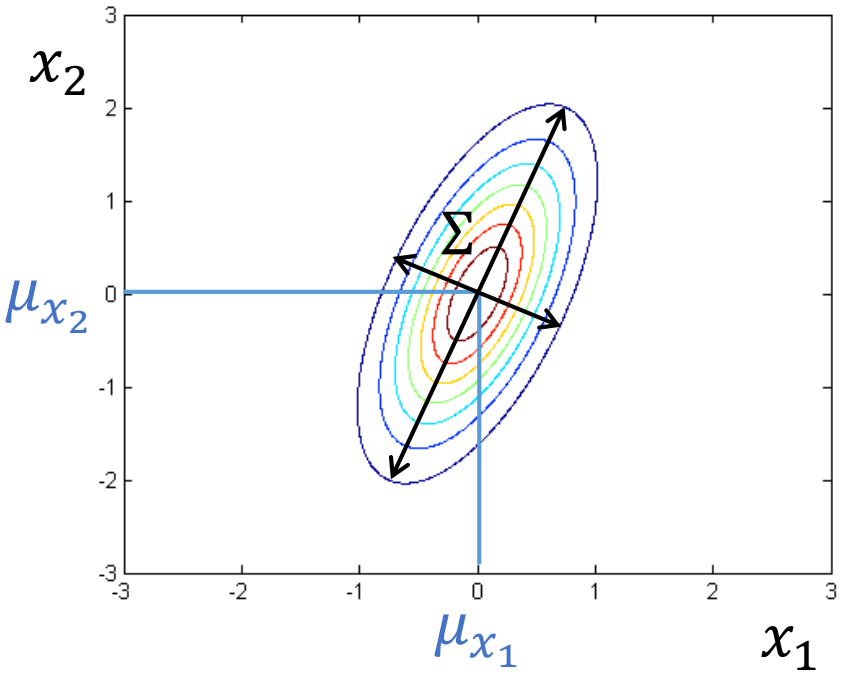
- Više od jedne slučajne varijable → dodeljujemo gustinu verovatnoće za svaku moguću kombinaciju vrednosti varijabli





Tačke na istoj elipsi imaju jednaku verovatnoću

Multivariate Gaussian 2D



U višedimenzionom prostoru, normalna distribucija je specificirana parametrima:

- μ – srednja vrednost
- Σ – kovarijansa

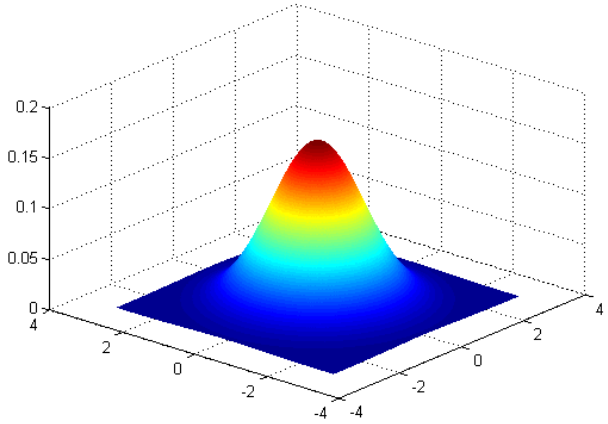
$\mu = [\mu_{x_1}, \mu_{x_2}]$ - centar distribucije

Varijansa svake dimenzije

$$\Sigma = \begin{pmatrix} \sigma_{x_1}^2 & \sigma_{x_1,x_2} \\ \sigma_{x_2,x_1} & \sigma_{x_2}^2 \end{pmatrix}$$ – specificira rasipanje i orijentaciju distribucije

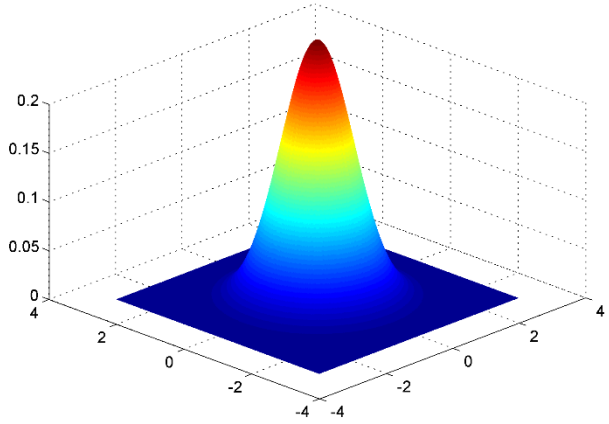
Orijentacija elipsi

Multivariate Gaussian 2D

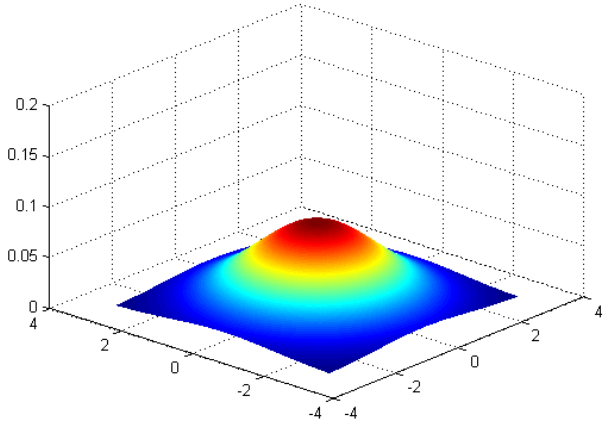


$$\Sigma = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

“standardna”
normalna distribucija

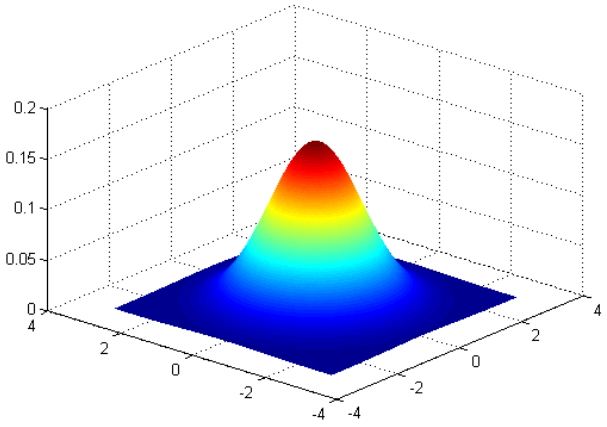


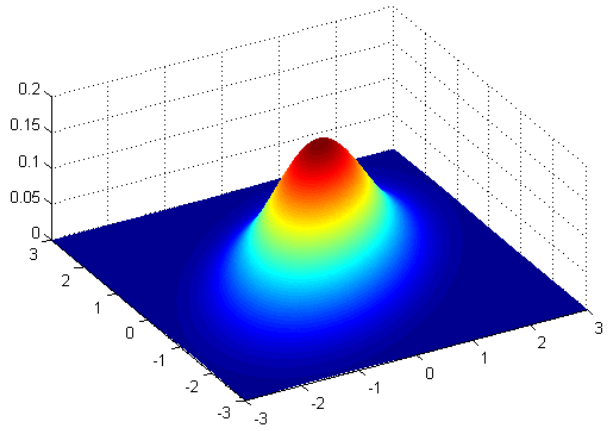
$$\Sigma = \begin{bmatrix} 0.6 & 0 \\ 0 & 0.6 \end{bmatrix}$$

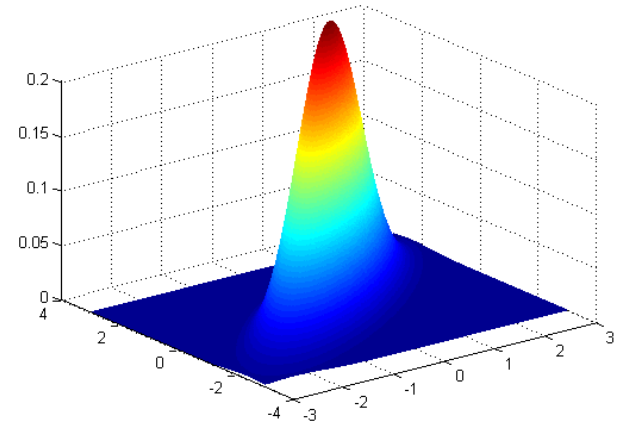


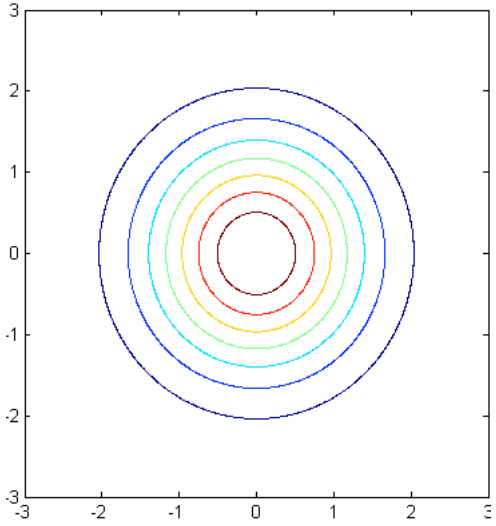
$$\Sigma = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$$

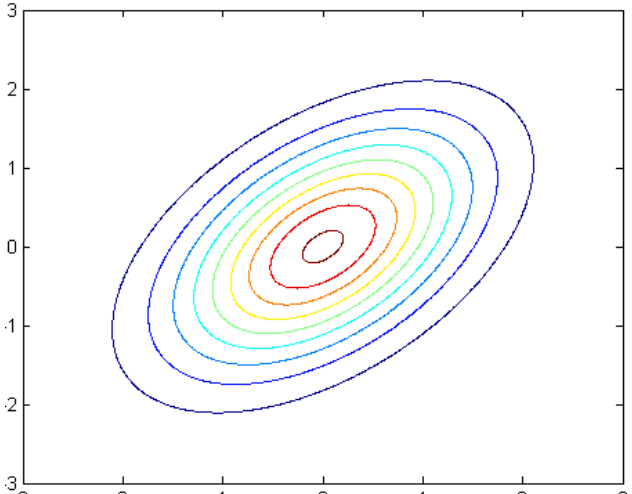
Multivariate Gaussian 2D

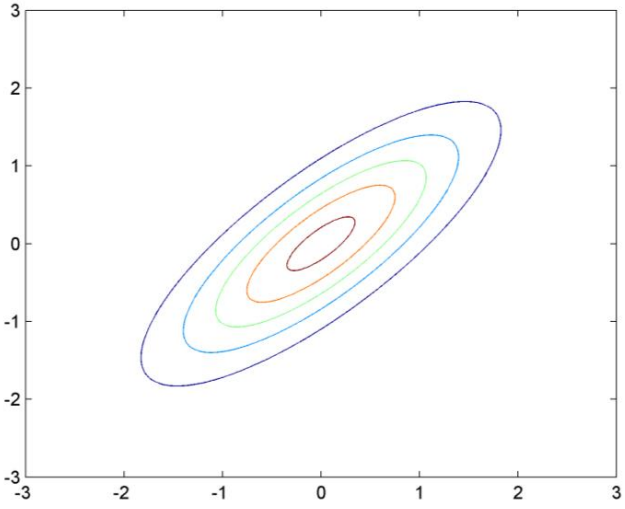










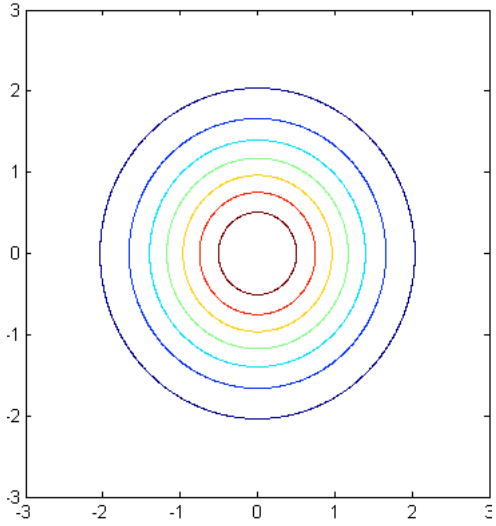


$$\Sigma = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

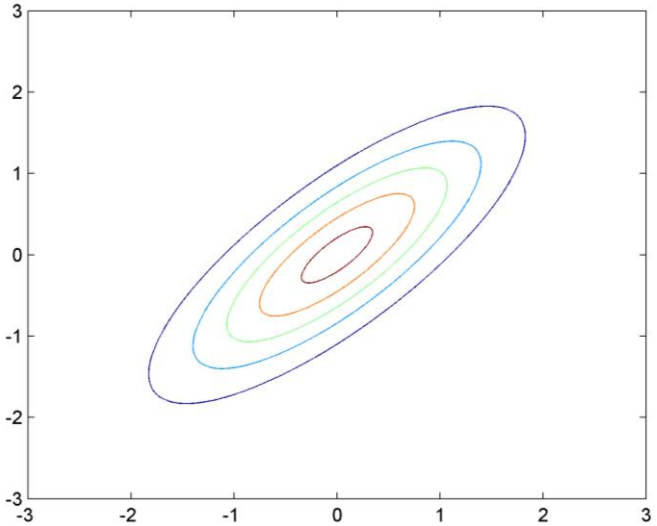
$$\Sigma = \begin{bmatrix} 1 & 0.5 \\ 0.5 & 1 \end{bmatrix}$$

$$\Sigma = \begin{bmatrix} 1 & 0.8 \\ 0.8 & 1 \end{bmatrix}$$

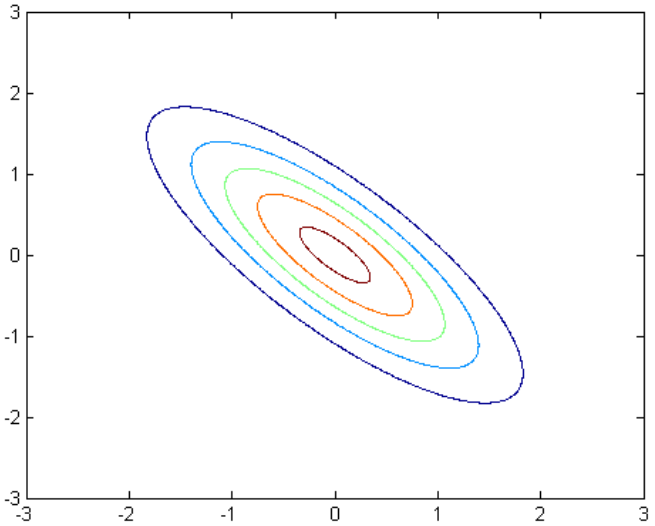
Multivariate Gaussian 2D



$$\Sigma = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$



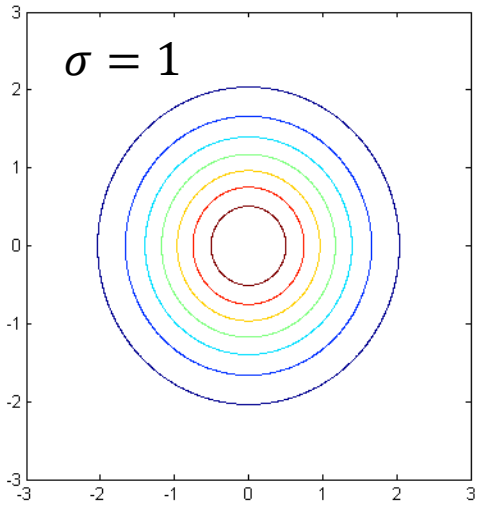
$$\Sigma = \begin{bmatrix} 1 & 0.8 \\ 0.8 & 1 \end{bmatrix}$$



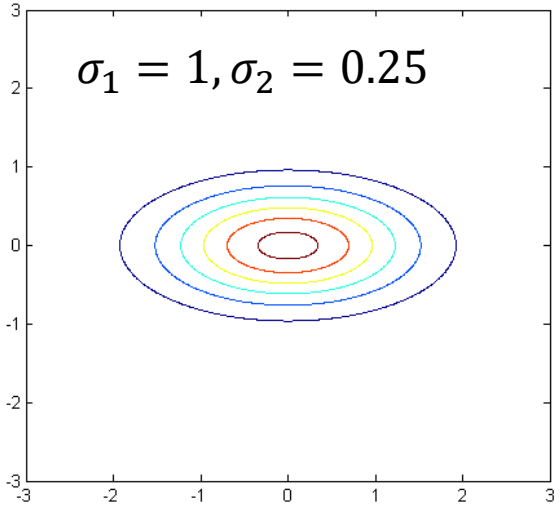
$$\Sigma = \begin{bmatrix} 1 & -0.8 \\ -0.8 & 1 \end{bmatrix}$$

Multivariate Gaussian 2D

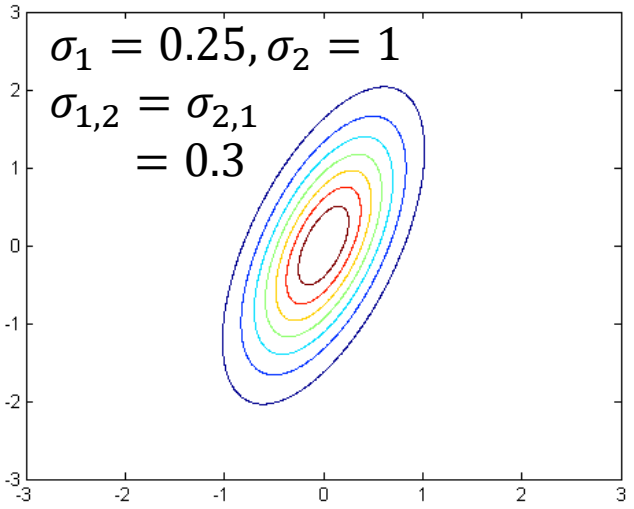
$$\Sigma = \begin{pmatrix} \sigma^2 & 0 \\ 0 & \sigma^2 \end{pmatrix}$$



$$\Sigma = \begin{pmatrix} \sigma_1^2 & 0 \\ 0 & \sigma_2^2 \end{pmatrix}$$



$$\Sigma = \begin{pmatrix} \sigma_1^2 & \sigma_{1,2} \\ \sigma_{2,1} & \sigma_2^2 \end{pmatrix}$$



- Ne moramo se ograničiti na samo dve dimenzije
- U opštem slučaju, ako imamo D dimenzija:

$$\mu \in \mathbb{R}^D, \Sigma \in \mathbb{R}^{D \times D}$$