0.3 General Multivariate Normal Denisty d Dimension

$$p(\vec{x}) \equiv \frac{1}{(2\pi)^{\frac{1}{2}}|\Sigma|^{-1}} e^{-\frac{(\vec{x}-\vec{\mu})\Sigma^{-}1(\vec{x}-\vec{\mu})}{2}}$$

- $\vec{x}$ is a component vector
- $\vec{\mu}$ is a mean vector
- Σ is a $d \times d$ covariance matrix
- $|\Sigma|$ determinant of Σ
- Σ^{-1} inverse of Σ
- $(\vec{x} - \vec{\mu})^T$ is the transpose of $(\vec{x} - \vec{\mu})$
- $\mu = \mathcal{E}[\vec{x}]$
- $\Sigma = \mathcal{E}[(\vec{x} - \vec{\mu})(\vec{x} - \vec{\mu})^T]$