Multivariate Normal distribution: A random vector $X = (X_1, \dots, X_n)$ with means $\mu = (\mu_1, \dots, \mu_n)$ that has joint pdf $f_X = \frac{1}{\sqrt{(2\pi)^n det\sum}} \exp\left(-\frac{1}{2}(x-\mu)^T \sum^{-1}(x-\mu)\right)$ is said to have a multivariate Normal distribution where $\mu = (\mu_1, \dots, \mu_n)$ is the vector of means of $X_1, \dots, X_n$ and the covariance matrix $\sum = [Cov(X_i, X_j); 1 \le i, j \le n]$, which must be positive definite for a pdf to exist.