Chapter 8 (part 2)

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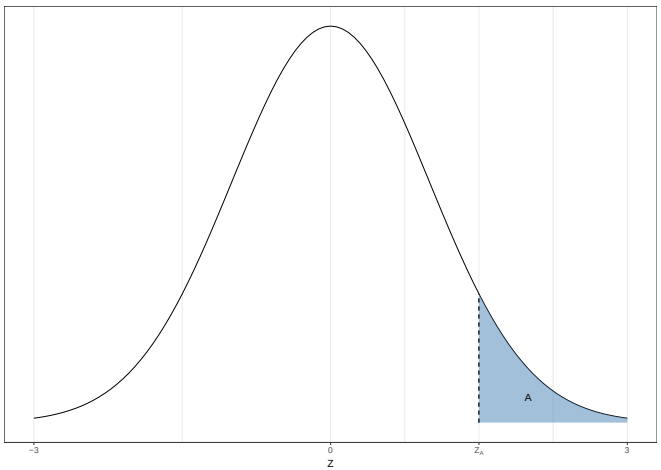
Quick review (1)

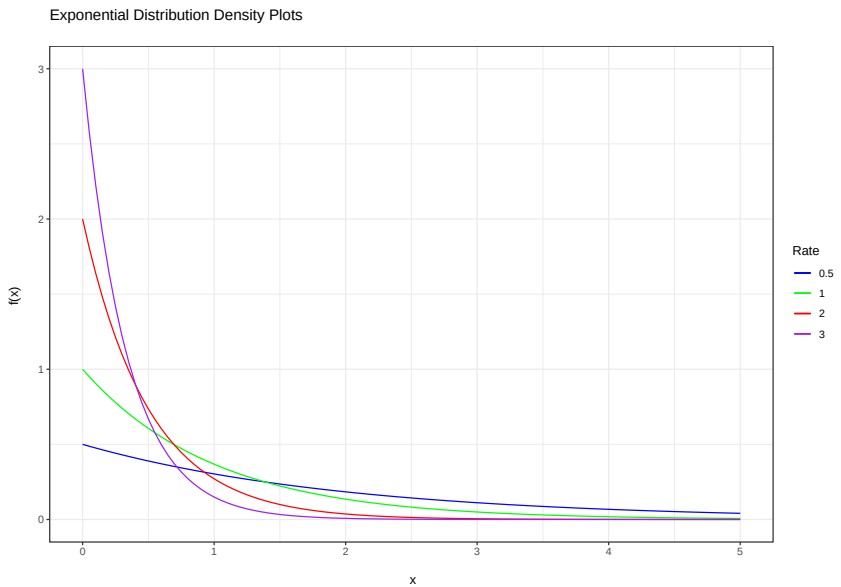
Continuous random variable:

- Normal Random variable
  - Always defined with a mean (μ) and variance (σ^2). Standard Normal is Normal with $\mu = 0$, $\sigma^2 = 1$.
  - For finding probabilities of interval (a, b), we need tables/computer programs.
  - Can convert any Normal RV (X) to standard Normal by $\frac{X-\mu}{\sigma}$.
  - Percentiles in Normal distribution, Z_A is defined as $P(Z > Z_A) = A$.



Quick review (2)

- Exponential Random Variable:
  - Defined by parameter λ.
  - $\mu = \sigma = \frac{1}{\lambda}$.
  - $P(X < x) = 1 - e^{-\lambda x}$
  - $P(x_1 < X < x_2) = P(X < x_2) - P(X < x_1) = e^{-\lambda x_1} - e^{-\lambda x_2}$
  - relationship between Poisson RV and Exp RV, read this.



Quick review (3)

Other distributions:

- Student's t distribution with parameter ν (called **"degrees of freedom"**).
  - $E(t) = 0$
  - $V(t) = \frac{\nu}{\nu-2}$ for $\nu > 2$
- χ^2 (pronounced Chi-squared) distribution with parameter ν.
  - $E\left(\chi^2_\nu\right) = \nu$.
  - $V\left(\chi^2_\nu\right) = 2\nu$.
- F distribution with two parameters ν_1 and ν_2.
  - $E(F_{\nu_1,\nu_2}) = \frac{\nu_2}{\nu_2-2} \quad \nu_2 > 2$.
  - $V(F_{\nu_1,\nu_2}) = \frac{2\nu_2^2(\nu_1+\nu_2-2)}{\nu_1(\nu_2-2)^2(\nu_2-4)} \quad \nu_2 > 4$