Fall 2018 STSCI 5080 Midterm Exam 2 Formula Sheet

- The pmf of the binomial distribution with parameters n and p, $Bin(n,p)$, is given by

$$p(k) = \binom{n}{k} p^k (1-p)^{n-k},\ k = 0, 1, \ldots, n.$$

- The pmf of the Poisson distribution with parameter λ, $Po(\lambda)$, is given by

$$p(k) = \frac{\lambda^k}{k!} e^{-\lambda},\ k = 0, 1, 2, \ldots$$

- The pdf of the uniform distribution on $[a,b]$, $U[a,b]$, where $a < b$, is given by

$$f(x) = \begin{cases} \frac{1}{b-a} & \text{if } a \le x \le b \\ 0 & \text{otherwise} \end{cases}.$$

- The pdf of the exponential distribution with parameter λ, $Ex(\lambda)$, is given by

$$f(x) = \begin{cases} \lambda e^{-\lambda x} & \text{if } x \ge 0 \\ 0 & \text{otherwise} \end{cases}.$$

- The pdf of the normal distribution with mean μ and variance σ^2, $N(\mu, \sigma^2)$, is given by

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-(x-\mu)^2/(2\sigma^2)},\ -\infty < x < \infty.$$

- The pdf of the gamma distribution with shape parameter α and scale parameter β, $Ga(\alpha, \beta)$, is given by

$$f(x) = \begin{cases} \frac{1}{\Gamma(\alpha)\beta^\alpha} x^{\alpha-1} e^{-x/\beta} & \text{if } x > 0 \\ 0 & \text{otherwise} \end{cases},$$

  where $\Gamma(\alpha)$ is the gamma function

$$\Gamma(\alpha) = \int_0^\infty x^{\alpha-1} e^{-x} dx.$$