Formula Sheet – Test 2 – STAT 515

For $X \sim$ Uniform(c,d):

$$P(a < X < b) = \frac{b-a}{d-c},\ \mu = \frac{c+d}{2},\ \sigma = \frac{d-c}{\sqrt{12}}$$

$$Z = \frac{X-\mu}{\sigma},\ X = Z\sigma + \mu$$

$$z = \frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$$

$$\bar{x} \pm t_{\alpha/2}(s/\sqrt{n}),$$

where $t_{\alpha/2}$ based on $n-1$ df

CI for p:

$$\hat{p} \pm z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$

$$\left(\frac{(n-1)s^2}{\chi^2_{\alpha/2}},\ \frac{(n-1)s^2}{\chi^2_{1-\alpha/2}}\right)$$

$$\left(\frac{s_1^2/s_2^2}{F_{\alpha/2(n_1-1,n_2-1)}},\ \frac{s_1^2/s_2^2}{1/F_{\alpha/2(n_2-1,n_1-1)}}\right)$$

Sample size formulas:

$$n = \frac{(z_{\alpha/2})^2\sigma^2}{B^2},\ n = \frac{(z_{\alpha/2})^2 pq}{B^2}$$

Test statistics:

$$z = \frac{\bar{x}-\mu_0}{\sigma/\sqrt{n}}$$

$$t = \frac{\bar{x}-\mu_0}{s/\sqrt{n}}$$

$$z = \frac{\hat{p}-p_0}{\sqrt{\frac{p_0 q_0}{n}}}$$