Inference About Means

- confidence interval for a population mean μ:
$$\bar{x} \pm t^* \frac{s}{\sqrt{n}}$$
with t^* from t with df $= n-1$

- significance test statistic for $H_0 : \mu = \mu_0$:
$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$
with P-values from t with df $= n-1$

- Two-sample confidence interval for $\mu_1 - \mu_2$:
$$(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$
with t^* from t with df the smaller of $n_1 - 1$ and $n_2 - 1$

- Two-sample significance test statistic for $H_0 : \mu_1 = \mu_2$:
$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$
with P-values from t with df the smaller of $n_1 - 1$ and $n_2 - 1$

Inference About Proportions

- confidence interval for p:
$$\hat{p} \pm z^* \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$$
with z^* from standard normal

- significance test statistic for $H_0 : p = p_0$:
$$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$$
with P-values from standard normal

- Two-sample confidence interval for $p_1 - p_2$:
$$(\hat{p}_1 - \hat{p}_2) \pm z^* \mathrm{SE}$$
where the standard error of $\hat{p}_1 - \hat{p}_2$ is
$$\mathrm{SE} = \sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n_1} + \frac{\hat{p}_2(1-\hat{p}_2)}{n_2}}$$

- Two-sample test statistic for $H_0 : p_1 = p_2$:
$$z = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}(1-\hat{p})\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$
where $\hat{p}$ is the pooled proportion of successes