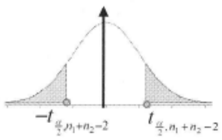
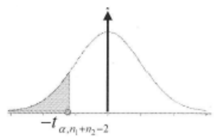
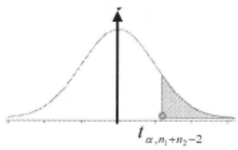
Tests for two means:

Assumption: homogeneity of variance ($\sigma_1^2 = \sigma_2^2$)

$\begin{cases} H_0: \mu_1 = \mu_2 \\ H_1: \mu_1 \neq \mu_2 \end{cases}$	$\begin{cases} H_0: \mu_1 \geq \mu_2 \\ H_1: \mu_1 < \mu_2 \end{cases}$	$\begin{cases} H_0: \mu_1 \leq \mu_2 \\ H_1: \mu_1 > \mu_2 \end{cases}$

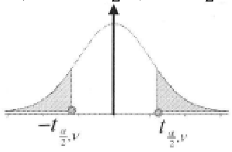
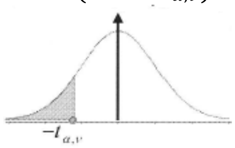
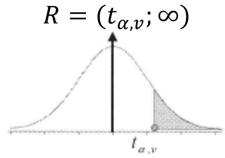
$$Statistics\ t_0 = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2} \cdot \frac{n_1+n_2}{n_1 n_2}}}$$

Two-sided critical interval:	Left-sided critical interval:	Right-sided critical interval:
$R = \left(-\infty; -t_{\frac{\alpha}{2}, n_1+n_2-2}\right) \cup \left(t_{\frac{\alpha}{2}, n_1+n_2-2}; \infty\right)$	$R = \left(-\infty; -t_{\alpha, n_1+n_2-2}\right)$	$R = \left(t_{\alpha, n_1+n_2-2}; \infty\right)$
		

Assumption: no homogeneity of variance ($\sigma_1^2 \neq \sigma_2^2$)

$\begin{cases} H_0: \mu_1 = \mu_2 \\ H_1: \mu_1 \neq \mu_2 \end{cases}$	$\begin{cases} H_0: \mu_1 \geq \mu_2 \\ H_1: \mu_1 < \mu_2 \end{cases}$	$\begin{cases} H_0: \mu_1 \leq \mu_2 \\ H_1: \mu_1 > \mu_2 \end{cases}$

$$Statistics\ \widetilde{t_0} = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

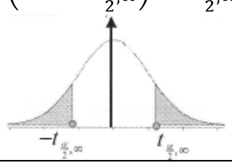
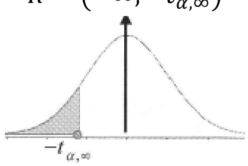
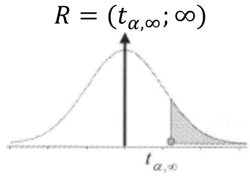
Two-sided critical interval:	Left-sided critical interval:	Right-sided critical interval:
$R = \left(-\infty; -t_{\frac{\alpha}{2}, v}\right) \cup \left(t_{\frac{\alpha}{2}, v}; \infty\right)$	$R = \left(-\infty; -t_{\alpha, v}\right)$	$R = \left(t_{\alpha, v}; \infty\right)$
		

$$v = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{(s_1^2/n_1)^2}{n_1-1} + \frac{(s_2^2/n_2)^2}{n_2-1}}$$

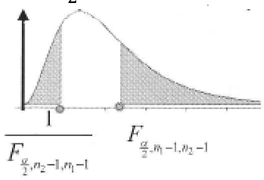
Assumption: big sample sizes $n_1, n_2 > 30$

$\begin{cases} H_0: \mu_1 = \mu_2 \\ H_1: \mu_1 \neq \mu_2 \end{cases}$	$\begin{cases} H_0: \mu_1 \geq \mu_2 \\ H_1: \mu_1 < \mu_2 \end{cases}$	$\begin{cases} H_0: \mu_1 \leq \mu_2 \\ H_1: \mu_1 > \mu_2 \end{cases}$

$$Statistics\ z_0 = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Two-sided critical interval:	Left-sided critical interval:	Right-sided critical interval:
$R = \left(-\infty; -t_{\frac{\alpha}{2}, \infty}\right) \cup \left(t_{\frac{\alpha}{2}, \infty}; \infty\right)$	$R = \left(-\infty; -t_{\alpha, \infty}\right)$	$R = \left(t_{\alpha, \infty}; \infty\right)$
		

Tests for two variances

<table>
<tr>
<td>$\begin{cases} H_0: \sigma_1^2 = \sigma_2^2 \\ H_1: \sigma_1^2 \neq \sigma_2^2 \end{cases}$</td>
<td>$\begin{cases} H_0: \sigma_1^2 \geq \sigma_2^2 \\ H_1: \sigma_1^2 < \sigma_2^2 \end{cases}$</td>
<td>$\begin{cases} H_0: \sigma_1^2 \leq \sigma_2^2 \\ H_1: \sigma_1^2 > \sigma_2^2 \end{cases}$</td>
</tr>
<tr>
<td colspan="3">$$Statistics\ F_0 = \frac{s_1^2}{s_2^2}$$</td>
</tr>
<tr>
<td>Two-sided critical interval:
$$R = \left(0; \frac{1}{F_{\frac{\alpha}{2}, n_2-1, n_1-1}}\right) \cup (F_{\frac{\alpha}{2}, n_1-1, n_2-1}; \infty)$$

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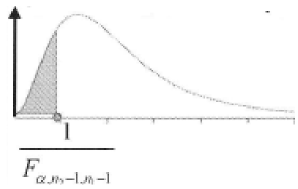
<td>Left-sided critical interval:
$$R = \left(0; \frac{1}{F_{\alpha, n_2-1, n_1-1}}\right)$$

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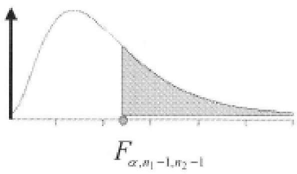
<td>Right-sided critical interval:
$$R = (F_{\alpha, n_1-1, n_2-1}; \infty)$$

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Tests for two fractions

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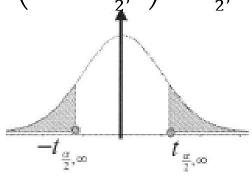
<td>$\begin{cases} H_0: p_1 = p_2 \\ H_1: p_1 \neq p_2 \end{cases}$</td>
<td>$\begin{cases} H_0: p_1 \geq p_2 \\ H_1: p_1 < p_2 \end{cases}$</td>
<td>$\begin{cases} H_0: p_1 \leq p_2 \\ H_1: p_1 > p_2 \end{cases}$</td>
</tr>
<tr>
<td colspan="3">$$Statistics\ z_0 = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{(1-\hat{p})\hat{p}} \cdot \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$</td>
</tr>
<tr>
<td colspan="3">$$\hat{p} = \frac{T_1 + T_2}{n_1 + n_2};\ \hat{p}_1 = \frac{T_1}{n_1}; \hat{p}_2 = \frac{T_2}{n_2}$$</td>
</tr>
<tr>
<td>Two-sided critical interval:
$$R = \left(-\infty; -t_{\frac{\alpha}{2},\infty}\right) \cup (t_{\frac{\alpha}{2},\infty}; \infty)$$

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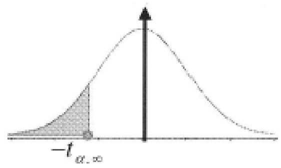
<td>Left-sided critical interval:
$$R = \left(-\infty; -t_{\alpha,\infty}\right)$$

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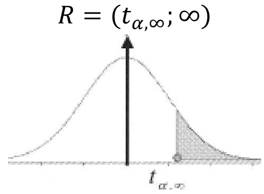
<td>Right-sided critical interval:
$$R = (t_{\alpha,\infty}; \infty)$$

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