1 Some useful formulæ

1.1 Chapter 6

margin of error: $m = z^*(\frac{\sigma}{\sqrt{n}})$

Where z* is the critical z-value (bottom of table D)

test statistic: For $H_0 : \mu = \mu_0$:

$z = \frac{(\overline{x}-\mu_0)}{(\frac{\sigma}{\sqrt{n}})}$

1.2 Chapter 7

margin of error for the mean of a single population:

$m = t^* \times SE_{\overline{x}}$, where

$SE_{\overline{x}} = \frac{s}{\sqrt{n}}$ and

t* is the critical t-value for (n-1) degrees of freedom for the appropriate confidence level (table D) and s is the sample standard deviation.

test statistic for the mean of a single population: For $H_0 : \mu = \mu_0$:

$t = \frac{(\overline{x}-\mu_0)}{SE_{\overline{x}}}$

Where t follows the Student's t-distribution with (n-1) degrees of freedom

margin of error for the difference in means (two populations): for the estimated difference in means $\mu_1 - \mu_2$ approximated by $\overline{x_1} - \overline{x_2}$:

$m = t^* \times \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$

where t* is the critical t-value for the appropriate degrees of freedom (table D) and s_1, s_2 are the sample standard deviations.

test statistic for the difference in means in two populations

Where $H_0 : \mu_1 = \mu_2$:

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

were the degrees of freedom can either be taken as the smaller of $n_1 - 1$ and $n_2 - 1$), or calculated by software.

1.3 Chapter 8

Large Sample Confidence interval for a Population Proportion

$SE_{\hat{p}} = \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

$m = z^* \times SE_{\hat{p}}$

and where $\hat{p} = \frac{X}{n}$ is the sample proportion.

Large Sample Significance Test for a Population Proportion

$H_0 : p = p_0$

$z = \frac{\hat{p}-p_0}{SE_{\hat{p}}}$

Large-Sample Confidence Interval for Comparing Two Proportions

$m = z^* \times \sqrt{\frac{\hat{p_1}(1-\hat{p_1})}{n_1} + \frac{\hat{p_2}(1-\hat{p_2})}{n_2}}$

where $\hat{p_1} = \frac{X_1}{n_1}$ is the proportion of successes from population 1, and $\hat{p_2} = \frac{X_2}{n_2}$ is the proportion of successes from population 2,

Large Sample Significance Test for Comparing Two Proportions

The z test statistic for $H_0 : p_1 = p_2$ is

$z = \frac{\hat{p_1}-\hat{p_2}}{\sqrt{\hat{p}(1-\hat{p})(\frac{1}{n_1}+\frac{1}{n_2})}}$

where $\hat{p}$ is the pooled sample proportion

$\hat{p} = \frac{X_1+X_2}{n_1+n_2}$

Please let me know of any typos or apparent errors in the above. Many thanks!
-Bob