Quiz 2 – Formulas

201-934-DW Business Statistics
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Date: Fall 2009

Binomial Probability Distribution

$P(x) = {}_nC_x\, p^x\, q^{n-x}$
$\mu = np$
$\sigma = \sqrt{npq}$

x = number of successes desired
n = total sample size
p = probability of success
q = probability of failure

Normal Distribution

$z = (x - \mu)/\sigma$
(with mean μ and standard deviation σ)

Approximating Mean and Standard Deviation

$$\bar{x} \approx \frac{\sum M \cdot f}{n}$$

$$s \approx \sqrt{\frac{\sum (M-\bar{x})^2 \cdot f}{n-1}} = \sqrt{\frac{\sum M^2 \cdot f - \frac{(\sum M \cdot f)^2}{n}}{n-1}}$$

where M = class mark

Correlation and Regression

$$SS(x) = \sum (x-\bar{x})^2 = \sum x^2 - \frac{(\sum x)^2}{n}$$

$$SS(xy) = \sum (x-\bar{x}) \cdot (y-\bar{y}) = \sum x \cdot y - \frac{(\sum x) \cdot (\sum y)}{n}$$

$\hat{y} = b_0 + b_1 \cdot x$ = line of best fit

$$b_1 = \frac{\sum (x_i-\bar{x}) \cdot (y_i-\bar{y})}{\sum (x_i-\bar{x})^2} = \frac{SS(xy)}{SS(x)} \qquad b_0 = \bar{y} - b_1 \cdot \bar{x}$$

$$r = \frac{\sum (x_i-\bar{x}) \cdot (y_i-\bar{y})}{\sqrt{\left(\sum (x_i-\bar{x})^2\right) \cdot \left(\sum (y_i-\bar{y})^2\right)}} = \frac{SS(xy)}{\sqrt{SS(x) \cdot SS(y)}}$$