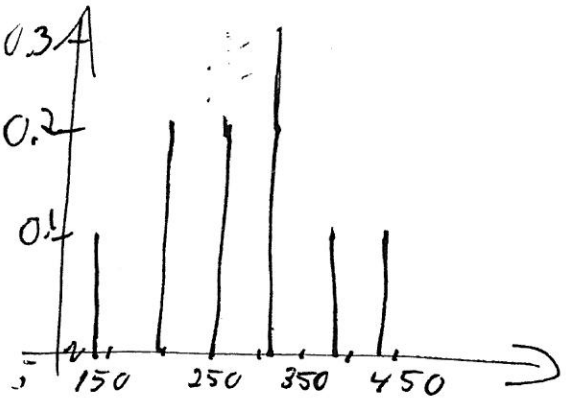
Kortfattad lösning till 732G26, Surveyme
mupps. 2009 03 23

1) $t = 275$ Antal urval $\binom{5}{2} = 10$ x = antal k

$S = (1,2)$ $x = (25\ 25)$ $\hat{t} = 5\bar{x} = 125$
$S = (1,3)$ $x = (25, 100)$ $\hat{t} = 312.5$
$S = (1,4)$ $\hat{t} = 250$
$S = (1,5)$ $\hat{t} = 187.5$
$S = (2,3)$ $\hat{t} = 312.5$
$S = (2,4)$ $\hat{t} = 250$
$S = (2,5)$ $\hat{t} = 187.5$
$S = (3,4)$ $\hat{t} = 437.5$
$S = (3,5)$ $\hat{t} = 375$
$S = (4,5)$ $\hat{t} = 312.5$



S^2 = popvarians $= \frac{1}{4}(\Sigma x^2 - 5\bar{x}^2) = 1062.5$
$s = 32.6$
exp° KI $\hat{t} \pm 5 \cdot s \Rightarrow \hat{t} \pm 163$

2) a) $110 \pm 1.96\sqrt{\frac{21^2}{18}\left(1 - \frac{50}{220}\right)}$

110 ± 8.53

b) $\hat{\bar{y}}_{str} = \frac{10}{50} \cdot 10 + \frac{22}{50} \cdot 35 + \frac{18}{50} \cdot 110 = 57$

$\widehat{Var}[\bar{y}_{str}] = \left(\frac{10}{50}\right)^2 \cdot \frac{2^2}{10}\left(1 - \frac{10}{50}\right) + \left(\frac{22}{50}\right)^2 \cdot \frac{4^2}{22}\left(1 - \frac{22}{50}\right)$
$+ \left(\frac{18}{50}\right)^2 \cdot \frac{21^2}{18}\left(1 - \frac{18}{50}\right) \approx 2.12377\ 6$

KI $57 \pm \underbrace{1.96 \cdot \sqrt{2.1238}}_{2.86}$

c) $n = 50$ $\hat{N}_i = N \cdot \frac{n_i}{n}$ $\hat{N}_1 = 44$ $\hat{N}_2 = 97$ $\hat{N}_3 = 79$

$n_1 = 50 \cdot \frac{44 - 2}{2135} = 2$ $n_2 = 9$ $n_3 = 39$

4/a) $n = 4 \quad N = 70$

t_y = totala antalet älgar i länskapet

$\hat{t}_{yr} = \hat{B} t_x = \frac{\bar{y}}{\bar{x}} \cdot t_x = \frac{9/4}{13/4} \cdot 210 = 145.4$

$\widehat{Var}[\hat{t}_{yr}] = N^2 \left(1 - \frac{n}{N}\right) \frac{s_e^2}{n}$

$s_e^2 = \frac{1}{n-1} \left(\sum y_i^2 \ldots + \hat{B}^2 \sum x_i^2 - 2\hat{B} \sum x_i y_i \right)$

$= \frac{1}{3} \left(35 + \left(\frac{9}{13}\right)^2 55 - 2\frac{9}{13} \cdot 42 \right) = 1.069$

$\widehat{Var}[\hat{t}_{yr}] = 70^2 \cdot \left(1 - \frac{4}{70}\right) \cdot \frac{1.069}{4}$

$= 1234.734$

$145.4 \pm \underbrace{1.96 \cdot 35.14}_{68.9}$

c) $\hat{t}_\psi = \frac{1}{4} \left(\frac{3}{0.015} + \frac{1}{0.002} + 0 + \frac{5}{0.021} \right) = 234.5$

$\widehat{Var}[\hat{t}_\psi] = \frac{1}{4} \left(\frac{\sum \frac{t_i^2}{\psi_i^2} - \hat{t}_\psi^2 \cdot 4}{3} \right) =$

$(y_i = t_i) \quad = 10556.97$

$234.5 \pm \underbrace{1.96 \cdot 102.75}_{201.4}$