2a) $\hat{P} = \frac{4}{26} = 0.153846154$

$\hat{\gamma} = 0.846153846$

2b) $\hat{R} = \frac{65}{104} = 0.625 = \frac{\bar{y}}{\bar{x}}$

$1 - \hat{R} = 0.375$

2c) $\hat{\mu}_{Y_d} = \bar{d} + \mu_X$

$\bar{d} = \bar{y} - \bar{x}$

$\mu_X = \frac{\sum x_i}{N} = \frac{3040}{800} = 3.8 = \mu_X$

$\bar{y} = \frac{65}{26} = 2.5$, $\bar{x} = \frac{104}{26} = 4$

$\hat{\mu}_{Y_d} = (2.5 - 4) + 3.8$

$\hat{\mu}_{Y_d} = 2.3$

$T_d = (800)(2.3)$

$T_d = 1840$

2d) $\hat{\mu}_{Yg} = \hat{R}\,\mu_X = \frac{\bar{y}}{\bar{x}}\,\mu_X$ (x: nb. de personnes) (y: nb. de voitures)

$\mu_X = \frac{3040}{800} = 3.8$

$\bar{y} = 26/26 = 1$, $\bar{x} = \frac{104}{26} = 4$

$\hat{\mu}_{Yg} = \left(\frac{1}{4.0}\right)(3.8)$

$\hat{\mu}_{Yg} = 0.95$

$T_g = (800)(0.95)$

$T_g = 760$

2e) $\hat{p} = 0.153846$

$\hat{\sigma}_{\hat{p}} = \sqrt{\frac{(0.153846)(0.846153)}{26-1}}\sqrt{1 - \frac{26}{800}}$

$= 0.07216017 * 0.983615$

$= 0.0709778$

Aut. 2006

25) $\hat{R} = 0.625$, $\hat{R}^2 = 0.4225$

$\hat{R} = \dfrac{\text{nb. d'inf.}}{\text{nb. de personnes}}$

$$\hat{\sigma}_{\bar{X}} = \frac{\sqrt{1-\frac{n}{N}}}{\sqrt{n}} \frac{\sqrt{S_Y^2 + \hat{R}^2 S_X^2 - 2\hat{R} S_{XY}}}{\bar{X}}$$

$$= \frac{\sqrt{1-\frac{26}{800}}}{\sqrt{26}} \frac{\sqrt{3.06 + (0.4225)(2.88) - 2*0.625*2.6}}{4.0}$$

$$= 0.048225693 \sqrt{1.0268}$$

$$= \quad " \quad * 1.013311403$$

$$= 0.0488676$$

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2g) $\hat{T}_d = N \hat{\mu}_{y_d}$

$= N[\bar{d} + \mu_x]$

$\hat{\sigma}_{\hat{T}_d} = N \hat{\sigma}_{\hat{\mu}_{y_d}}$

$= N \frac{\sqrt{1 - \frac{n}{N}}}{\sqrt{n}} \sqrt{\Delta_y^2 + \Delta_x^2 - 2\Delta_{xy}}$

$= 800 \frac{\sqrt{1 - \frac{26}{800}}}{\sqrt{26}} \sqrt{3.06 + 2.88 - 2 * 2.6}$

$= 154.3222 * 0.860232527$

$= 132.75299$

(3)

a) $n_0 = \left(\frac{2\Delta y}{R\bar{y}}\right)^2$

$= \left(\frac{2 * 1.749285}{(0.10)(2.5)}\right)^2$

$= 195.83987$

$n = \frac{n_0}{1 + \frac{n_0}{N}}$ $\quad N = 800$

$n = 157.32639$

3b) $\hat{R} = \frac{65/26}{3040/800} = \frac{2.5}{3.8} = \frac{\bar{y}}{\mu_x}$

$\hat{R} = 0.6578$

3a) $\hat{\sigma}_{\hat{R}} = \frac{1}{\mu_x} \frac{\Delta y}{\sqrt{n}} \sqrt{1 - \frac{n}{N}}$

$= \left(\frac{1}{3.8}\right)\left(\frac{1.749285}{\sqrt{26}}\right)\sqrt{1 - \frac{26}{800}}$

$\hat{\sigma}_{\hat{R}} = 0.08880$

(5)

3d) $\bar{y}' = \dfrac{3+2+2+1+22(0)}{26}$

$\bar{y}' = 0.30769$

$s_{y'} = 0.788377$

$T' = N\bar{y}'$

$= 800 * 0.30769$

$T' = 246.15384$

3e) $T' = N\bar{y}'$

$\hat{\sigma}_{T'} = N \dfrac{s_{y'}}{\sqrt{26}} \sqrt{1 - \dfrac{26}{800}}$

$= 800 * \dfrac{0.788377}{\sqrt{26}} \sqrt{1 - \dfrac{26}{800}}$

$\hat{\sigma}_{T'} = 121.66408$
