A09

Saturday, 26. October 2019 15:10

a) $Y = 2X + 100 + \varepsilon$

$Y \sim NV(\mu_y, \sigma_y)$

$\mu_y = 2\mu_x + 100 + \mu_\varepsilon$

$\mu_y = 2 \cdot 10 + 100 + 0 = 120$

$\sigma_y = 2 \cdot \sigma_x + \sigma_\varepsilon$

$\sigma = 2 \cdot 12 + 52 = 76$

$Y \sim NV(120, 76)$

$VAR_y = VAR_x + VAR_\varepsilon$

$VAR_y = 2 \cdot \sigma_x + \sigma_\varepsilon^2 = 32^2 + 52^2 = 3280$

$$\frac{VAR_x}{VAR_y} = 0.176 \quad (17.6\%)$$

c) no, as Variance only describes how far the values are spread, whereas we want to see how the expected values correlate and not how far they are spread