

50	60	70	21
60			

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$$r_{xy}(k) = \frac{\sum_{t=1}^{n-k} (x_t - \bar{x})(y_{t+k} - \bar{y})}{\sqrt{\sum_{t=1}^n (x_t - \bar{x})^2 \cdot \sum_{t=1}^n (y_{t+k} - \bar{y})^2}}$$

$$f_{xy}(1) = \frac{-576.667}{\sqrt{1750 \times 683.33}} = -0.527$$

$$f_{xy}(2) = \frac{-91.667}{\sqrt{1750 \times 683.33}} = -0.0838$$

$$\begin{array}{r} -91.667 \\ \hline \sqrt{1750 \times 683.33} \\ \hline = -0.0838 \end{array}$$

Interpretation:

- Both road y show strong positive auto-correlation at ~~lag~~ lag 1, indicating that consecutive values are similar.
- Auto-correlation at lag 2 is much weaker for both variables.
- Negative cross-correlation at lag 1 (-0.527) indicates that as vehicle density increases, travel speed tends to decrease and at lag 2 is negligible (-0.0838).