GP Model fit

$$Y = GP(\beta, \sigma^2 I)$$

$$L = (2\pi)^{-\frac{n}{2}} \cdot |\Sigma_n|^{-\frac{1}{2}} e^{-\frac{1}{2}(y-\beta\cdot\vec{1})^T \cdot \Sigma_n^{-1}(y-\beta\cdot\vec{1})}$$

$$l = C - \frac{1}{2}\log|\Sigma_n| - \frac{1}{2}(y-\beta\cdot\vec{1})^T \Sigma_n^{-1}(y-\beta\cdot\vec{1})$$

$$\frac{\partial l}{\partial \beta} = 0 \Rightarrow \hat{\beta} = (\vec{1}^T \cdot K_n^{-1} \cdot \vec{1})^{-1} \cdot (\vec{1}^T \cdot K_n^{-1} \cdot y)$$

$$\Sigma_n = v \cdot K_n$$

$$\Rightarrow l = C - \frac{n}{2}\log^{v} - \frac{1}{2}\log^{|K_n|} - \frac{1}{2}\frac{1}{v}(y-\beta)^T K_n^{-1}(y-\beta)$$

$$\frac{\partial l}{\partial v} = 0 \Rightarrow \hat{v} = \frac{1}{n}(y-\beta)^T K_n^{-1} \cdot (y-\beta)$$

$$l = C - \frac{n}{2}\log^{(y-\beta)^T \cdot K_n^{-1} \cdot (y-\beta)} - \frac{1}{2}\log|K_n|$$

$$\beta = 0$$

$$\Rightarrow \frac{\partial l}{\partial \cdot} = -\frac{n}{2} \cdot \frac{-y^T K_n^{-1} \cdot \frac{\partial K_n}{\partial \cdot} K_n^{-1} y}{y^T K_n^{-1} \cdot y} - \frac{1}{2}\operatorname{tr}\left(K_n^{-1} \cdot \frac{\partial K_n}{\partial \cdot}\right)$$

$K_n = C_n + 6 \cdot T$