

$$\text{Var}(S^2) = 2 \frac{\sigma^4}{n-1}$$

$$\text{Var}\left(\frac{(n-1)S^2}{\sigma^2}\right) = \text{Var}(\chi_{n-1}^2)$$

$$\frac{(n-1)^2}{\sigma^4} \text{Var}\left(\frac{S^2}{\sigma^2}\right) = 2(n-1)$$

$$\text{Var}(S^2) = \frac{2(n-1)\sigma^4}{(n-1)^2} = \frac{2\sigma^4}{n-1}$$

H14: g : stel $X^T X = R^T R$

$$\hat{\beta} = (X^T X)^{-1} X^T y = (R^T R)^{-1} X^T y$$

$$\begin{aligned} R\hat{\beta} &= R(R^T R)^{-1} X^T y \\ &= R R^{-1} R^T^{-1} X^T y \\ &= (R^T)^{-1} X^T y \end{aligned}$$

definieer $v = (R^T)^{-1} X^T y \Rightarrow R^T v = X^T y$

en $R\hat{\beta} = v$

$$\begin{pmatrix} R \end{pmatrix} \begin{pmatrix} \hat{\beta} \end{pmatrix} = \begin{pmatrix} v \end{pmatrix}$$

langs substitueer als v bekend is

$$\begin{pmatrix} R^T \end{pmatrix} \begin{pmatrix} v \end{pmatrix} = \begin{pmatrix} X^T \end{pmatrix} \begin{pmatrix} y \end{pmatrix} = \begin{pmatrix} \end{pmatrix}$$

langs substitueer

Berekening Cholesky decompositie $O(n^3)$