

7. cvičení

$$\begin{aligned} & \text{\textbackslash}\text{def}\text{\textbackslash}mcal\#1\{\text{\textbackslash}mathcal\{\#1\}\} \text{\textbackslash}\text{def}\text{\textbackslash}sca\#1\#2\{\text{\textbackslash}angle \#1, \#2 \text{\textbackslash}rangle\} \text{\textbackslash}\text{def}\text{\textbackslash}N\{\text{\textbackslash}mathbb{N}\} \\ & \text{\textbackslash}\text{def}\text{\textbackslash}R\{\text{\textbackslash}mathbb{R}\} \text{\textbackslash}\text{def}\text{\textbackslash}Q\{\text{\textbackslash}mathbb{Q}\}\} \text{\textbackslash}\text{def}\text{\textbackslash}Z\{\text{\textbackslash}mathbb{Z}\}\} \text{\textbackslash}\text{def}\text{\textbackslash}D\{\text{\textbackslash}mathbb{D}\}\} \\ & \text{\textbackslash}\text{def}\text{\textbackslash}bm\#1\{\text{\textbackslash}boldsymbol\{\#1\}\} \text{\textbackslash}\text{def}\text{\textbackslash}vv\#1\{\text{\textbackslash}mathbf\{\#1\}\} \text{\textbackslash}\text{def}\text{\textbackslash}vp\#1\{\text{\textbackslash}pmb\{\#1\}\} \\ & \text{\textbackslash}\text{def}\text{\textbackslash}floor\#1\{\text{\textbackslash}lfloor \#1 \text{\textbackslash}rfloor\} \text{\textbackslash}\text{def}\text{\textbackslash}ceil\#1\{\text{\textbackslash}lceil \#1 \text{\textbackslash}rceil\} \text{\textbackslash}\text{def}\text{\textbackslash}grad\#1\{\text{\textbackslash}mathrm\{grad\} , \#1\} \\ & \text{\textbackslash}\text{def}\text{\textbackslash}ve\{\text{\textbackslash}varepsilon\} \text{\textbackslash}\text{def}\text{\textbackslash}im\#1\{\text{\textbackslash}mathrm\{im\}\(\#1)\} \text{\textbackslash}\text{def}\text{\textbackslash}tr\#1\{\text{\textbackslash}mathrm\{tr\}\(\#1)\} \\ & \text{\textbackslash}\text{def}\text{\textbackslash}norm\#1\{\text{\textbackslash}left\text{\textbackslash}vert \text{\textbackslash}left\text{\textbackslash}vert \#1 \text{\textbackslash}right\text{\textbackslash}vert\text{\textbackslash}right\text{\textbackslash}vert\} \text{\textbackslash}\text{def}\text{\textbackslash}sca\#1\#2\{\text{\textbackslash}angle \#1, \#2 \text{\textbackslash}rangle\} \\ & \text{\textbackslash}\text{def}\text{\textbackslash}ex\#1\{\text{\textbackslash}mathrm\{E\} ,\text{\textbackslash}left(\#1\text{\textbackslash}right)\} \text{\textbackslash}\text{def}\text{\textbackslash}exv\#1\{\text{\textbackslash}mathrm\{E\} ,\text{\textbackslash}vv\{\#1\}\} \end{aligned}$$

Nechť \mathbf{Y} jsou data, $\hat{\mathbf{Y}} = \mathbf{X} \hat{\boldsymbol{\beta}}$, $\mathbf{E} \hat{\mathbf{Y}} = \mathbf{E} \mathbf{Y}$ je odhad \mathbf{Y} a \mathbf{e} je odhad \mathbf{v} .

A máme **celkovou sumu čtverců** $TSS = \sum_{i=1}^n (Y_i - \overline{Y})^2$ také **vysvětlovanou sumu čtverců** $ESS = \sum_{i=1}^n (\hat{Y}_i - \overline{Y})^2$ a
neposlední řadě **reziduální sumu čtverců** $RSS = \sum_{i=1}^n (Y_i - \hat{Y}_i)^2$

A platí $TSS = RSS + ESS$

a nechť R^2 je **koeficient determinace** $R^2 = \frac{ESS}{TSS} \in (0, 1]$ a **adjustovaný koeficient determinace** $R^2_{adj} = 1 - \frac{\frac{RSS}{n-p}}{\frac{TSS}{n-1}}$

Dále $\hat{\sigma}^2 = \frac{RSS}{n - p}$ a $var(\hat{vvp \beta}) = \hat{\sigma}^2 (vvp X^T vvp X)^{-1}$ Přičemž $var(\hat{vvp \beta})$ dostaneme pomocí `vcov(<model>)`