

7. cvičení

$\$ \backslash \mathrm{mcal} \# 1 \{ \backslash \mathrm{mathcal} \{ \# 1 \} \}$ $\backslash \mathrm{scal} \# 1 \# 2 \{ \backslash \angle \# 1, \# 2 \backslash \rangle \}$ $\backslash \mathrm{N} \{ \backslash \mathrm{mathbb} \mathrm{N} \}$
 $\backslash \mathrm{R} \{ \backslash \mathrm{mathbb} \mathrm{R} \}$ $\backslash \mathrm{Q} \{ \backslash \mathrm{mathbb} \{ \mathrm{Q} \} \}$ $\backslash \mathrm{Z} \{ \backslash \mathrm{mathbb} \{ \mathrm{Z} \} \}$ $\backslash \mathrm{D} \{ \backslash \mathrm{mathbb} \{ \mathrm{D} \} \}$
 $\backslash \mathrm{bm} \# 1 \{ \backslash \mathrm{boldsymbol} \{ \# 1 \} \}$ $\backslash \mathrm{vv} \# 1 \{ \backslash \mathrm{mathbf} \{ \# 1 \} \}$ $\backslash \mathrm{vvp} \# 1 \{ \backslash \mathrm{pmb} \{ \# 1 \} \}$
 $\backslash \mathrm{floor} \# 1 \{ \backslash \mathrm{floor} \# 1 \backslash \mathrm{rfloor} \}$ $\backslash \mathrm{ceil} \# 1 \{ \backslash \mathrm{ceil} \# 1 \backslash \mathrm{rceil} \}$ $\backslash \mathrm{grad} \# 1 \{ \mathrm{grad} \}$, $\# 1 \}$
 $\backslash \mathrm{ve} \{ \backslash \mathrm{varepsilon} \}$ $\backslash \mathrm{im} \# 1 \{ \mathrm{im} \{ \# 1 \} \}$ $\backslash \mathrm{tr} \# 1 \{ \mathrm{tr} \{ \# 1 \} \}$
 $\backslash \mathrm{norm} \# 1 \{ \backslash \left \backslash \mathrm{vert} \backslash \left \backslash \mathrm{vert} \backslash \right \backslash \mathrm{right} \backslash \mathrm{vert} \backslash \right \backslash \mathrm{right} \backslash \mathrm{vert} \}$ $\backslash \mathrm{scal} \# 1 \# 2 \{ \backslash \angle \# 1, \# 2 \backslash \rangle \}$
 $\backslash \mathrm{ex} \# 1 \{ \mathrm{E} \}$, $\backslash \left(\# 1 \backslash \right)$ $\backslash \mathrm{exv} \# 1 \{ \mathrm{E} \}$, $\backslash \mathrm{vv} \{ \# 1 \} \}$ $\$ \backslash \mathrm{ex} \# 1 \{ \mathrm{E} \}$, $\backslash \left(\# 1 \backslash \right)$ $\backslash \mathrm{exv} \# 1 \{ \mathrm{E} \}$, $\backslash \mathrm{vv} \{ \# 1 \} \}$ $\$$

Nechť $\backslash \mathrm{vv} \mathrm{Y}$ jsou data, $\hat{\backslash \mathrm{vv} \mathrm{Y}} = \backslash \mathrm{vv} \mathrm{X} \hat{\backslash \mathrm{vvp} \mathrm{beta}}$, $\backslash \mathrm{qqquad} \mathrm{E} \hat{\backslash \mathrm{vv} \mathrm{Y}} = \mathrm{E} \backslash \mathrm{vv} \mathrm{Y}$ je odhad $\backslash \mathrm{vv} \mathrm{Y}$ a $\backslash \mathrm{vv} \mathrm{e}$ je odhad $\backslash \mathrm{vvp} \mathrm{ve}$.

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

A platí $\mathrm{TSS} = \mathrm{RSS} + \mathrm{ESS}$

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

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

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