“Peaks Over Threshold” Model
Generalised Pareto Distributions

\[ H(x; \gamma, \sigma) = 1 - \left(1 + \gamma \frac{x}{\sigma}\right)^{-\frac{1}{\gamma}}, \quad 1 + \gamma \frac{x}{\sigma} > 0 \]

\[ H(x) = 1 - e^{-x/\sigma} \quad \gamma = 0 \]

\[ F_u(x) = P(X < u + x | X > u) = \frac{F(u + x) - F(u)}{1 - F(u)} \]

\[ x^F = \sup \{x : F(x) < 1\} \]

\[ \lim_{u \to x^F} \inf_{0 < \sigma < \infty} \sup_{0 \leq x < \infty} |F_u(x) - H(x; \gamma, \sigma)| = 0 \]

for some \( \gamma \Leftrightarrow F \in D(G) \) for some GEV \( G \)
Generalized Pareto CDFs for Pareto ($\gamma = 0.5$), Exponential ($\gamma = -0$) and Pareto II ($\gamma = -0.5$)
Generalized Pareto DFs for Pareto ($\gamma = 0.5$), Exponential ($\gamma = -0$) and Pareto II ($\gamma = -0.5$)
Mean residual life plot for daily rainfall data
Parameter estimates against threshold for daily rainfall data

Statistical Modeling of Extreme Values
Profile likelihood for $\gamma$ in threshold excess model of daily rainfall data
Profile likelihood for 100-year return level in threshold excess model of daily rainfall data.
Diagnostic plots for threshold excess model fitted to daily rainfall data

Probability Plot

Quantile Plot

Return Level Plot

Density Plot

Statistical Modeling of Extreme Values
Mean residual life plot for transformed Dow Jones Index data
Diagnostic plots for threshold excess model fitted to transformed Dow Jones Index data

Probability Plot

Quantile Plot

Return Level Plot

Density Plot

Statistical Modeling of Extreme Values
Threshold exceedances by transformed Dow Jones Index series