

TASK 1 EQUATIONS

Frechet Distribution Equation (Probability density function)

$$(f(x) = \begin{cases} \frac{\alpha}{\gamma} \left(\frac{x}{\gamma}\right)^{-\alpha-1} e^{-\left(\frac{x}{\gamma}\right)^{-\alpha}} & \text{for } x \geq 0, \\ 0 & \text{otherwise.} \end{cases})$$

Frechet Distribution Equation (Cumulative distribution function)

$$(\left\{ F(x) = e^{-\left(\frac{x}{\gamma}\right)^{-\alpha}} \quad \text{for } x \geq 0. \right. \quad)$$

Frechet Distribution Equation (Inverse CDF)

$$(\left\{ F^{-1}(p) = \gamma (-\ln(p))^{-1/\alpha} \quad \text{for } 0 < p \leq 1. \right. \quad)$$

TASK 2 EQUATIONS

KL Divergence

$$\left(\left\{ D_{\text{KL}}(P \parallel Q) = \sum_{x \in \mathcal{X}} P(x) \log \left(\frac{P(x)}{Q(x)} \right) \right. \right)$$

Mutual Information

$$\left(\left\{ I(X; Y) = \sum_{x \in \mathcal{X}, y \in \mathcal{Y}} P(X = x, Y = y) \log \frac{P(X=x, Y=y)}{P(X=x)P(Y=y)} \right. \right)$$

Conditional entropy

$$\left(\left\{ H(X|Y) = - \sum_{x \in \mathcal{X}, y \in \mathcal{Y}} P(X = x, Y = y) \log \frac{P(X=x, Y=y)}{P(Y=y)} \right. \right)$$

Entropy

$$\left(\left\{ H(X) = - \sum_{x \in \mathcal{X}} P(X = x) \log P(X = x) \right\} \right)$$

Cross Entropy

$$\left(\left\{ H(p, q) = - \sum_{x \in \mathcal{X}} p(x) \log q(x) \right\} \right)$$