Podsetnik za prvi kolokvijum - Teorija odlučivanja 2016/2017

Invertovanje

$$x_{ij} = \frac{1}{x_{ij}}$$

Normalizacija

L∞ → $x_{ij} = \frac{x_{ij}}{\max_j(x_{ij})}$

L1 → $x_{ij} = \frac{x_{ij}}{sum_j(x_{ij})}$

MAXMIN → $\frac{x_{ij} - MIN_j(x_{ij})}{MAX_j(x_{ij}) - MIN_j(x_{ij})}$

Prometej

$$x \rightarrow \max = A - B, \min = B - A$$

$$p(x) = \begin{cases} 0, x \le m \\ \frac{x-m}{n-m}, m < x \le n \\ 1, x > n \end{cases}$$

$$T^+ = avg_i(v_{ij})$$

$$T^- = avg_j(v_{ij})$$

$$T = T^+ - T^-$$

a' ≻ a''

$$Q(a') - Q(a'') \ge DQ$$

$$DQ = \min(0{,}25, \frac{1}{J-1})$$

∃v, a' > a'',
v ∈ {(0,25, 0,75), 1, 0}

Korisnost

$$y = y_0\left(1 - \frac{x - x_0}{x_1 - x_0}\right) + y_1\left(1 - \frac{x_1 - x}{x_1 - x_0}\right)$$

F-je korisnosti

max → $k_i < \frac{M}{2} \rightarrow K(x) = 1 - e^{-\frac{\alpha x}{M}}$

$k_i > \frac{M}{2} \rightarrow K(x) = e^{-\frac{\alpha(M-x)}{M}}$

min → $k_i < \frac{M}{2} \rightarrow K(x) = e^{-\frac{\alpha x}{M}}$

$k_i > \frac{M}{2} \rightarrow K(x) = 1 - e^{-\frac{\alpha(M-x)}{M}}$

Agregacije kod VATK

$$v(A_i) = \sum_{j=1}^{k} w_j x_{ij}$$

$$v(A_i) = \prod_{j=1}^{k} w_j x_{ij}$$

$$v(A_i) = \prod_{j=1}^{k} x_{ij}$$

PCA

$$\%\ \text{var} = \frac{\lambda_i}{sum(\lambda)}$$

$$w_{nova} = w_{stara} * GK$$

$$a_{nova} = a_{stara} * GK$$

$$k = \text{kolona}(GK)$$

$$v(a) = \sum_{j=1}^{k} w_j a_{ij}$$

VAO METODE

JAT → $v(A_i) = \sum_{j=1}^{k} w_j x_{ij}$

MAXIMIN → $\max_{i \in A} \min_{j \in K} f(i,j)$

MAXIMAX → $\max_{i \in A} \max_{j \in K} f(i,j)$

IKOR → $v * OK + (1 - v) * MAXMIN$

AHP

1. način

$x_{ij} = \frac{x_{ij}}{sum_j(x_{ij})}$

$v(X_i) = avg_i(x_{ij})$

2. način

$A_{n+1} = A_n * A_n$

$x_{ij} = \frac{x_{ij}}{sum_j(x_{ij})}$

$v(X_i) = avg_i(x_{ij})$

Grupni AHP

$GS_i = \sqrt[n]{\prod_{k=1}^{n} v_{ik}}$

$\overline{x_i} = \frac{\sum_{i=1}^{n} w_i x_i}{\sum_{i=1}^{n} w_i}$

Konzistentnost AHP

1. Odrediti *w* krit./alt.
2. Pomnožiti svaku *j* matrice procene *w* i *sum*
3. Podeliti dobijeni vektor sa *w*
4. Izabrati λ_{max} iz 2
5. CI → $\frac{\lambda_{max} - n}{n-1}$
6. CR → $\frac{CI}{RI}$

n	3	4	5	6
RI	0,58	0,9	1,12	1,24

Podsetnik za drugi kolokvijum – Teorija odlučivanja 2016/2017

Odlučivanje pri riziku

$$r_i = \sqrt{\sum_{k=1}^{n} \frac{\delta_k^2 w_k^2}{max_k^2}}$$

$$\delta_i = \sqrt{\sum_{s=1}^{m} w_s * (X_{is} - \bar{X}_i)^2}$$

Način računanja	Sigurnost
OK – rizik	84%
OK – 1,3 * rizik	90%
OK – 1,7 * rizik	95%
OK – 2,4 * rizik	99%

Napredno strukturiranje problema odlučivanja

$$cov(x,y) = \frac{1}{N}\sum_{i=1}^{n}(x_i - \dot{x})(y_i - \bar{y})$$

$$cor(x,y) = \frac{cov(x,y)}{stdev(x) * stdev(y)}$$

$$\hat{y} = a + b(x) * x$$

$$b(x) = \frac{cov(x,y)}{var(x)}$$

$$a = avg(y - b(x) * x)$$

$$cov(x,y) = \frac{1}{N}\sum_{i=1}^{n}(x_i - \dot{x})(y_i - \bar{y})$$

$$SSE = (y - \hat{y})^2$$

$$RMSE = \sqrt{\frac{SSE}{n}}$$

$$R^2 = 1 - \frac{SEE}{n * var(y)}$$

Algoritam k najbližih suseda

$$U(S_0, S_m) = \sqrt{\sum_{k=1}^{n}(S_{o,i} - S_{m,i})^2 * w_i}$$

$$Overlap = \begin{Bmatrix} 0: X = Y \\ 1: X \neq Y \end{Bmatrix}$$

$$Goodall3 = \begin{Bmatrix} p(X)^2 : X = Y \\ 1: X \neq Y \end{Bmatrix}$$

$$p(x) = \begin{Bmatrix} 0, x \leq m \\ \frac{x-m}{n-m}, m < x \leq n \\ 1, x > n \end{Bmatrix}$$

ID3

$$H(S) = -\sum_{i=1}^{n} p_i \log_2(p_i)$$

$$p_i = \frac{|C_i|}{|S|}$$

$$\log_2 X = \frac{\log_{10} X}{\log_{10} 2} = \frac{\log_{10} X}{0.301}$$

$$H(X,S) = \sum_{i=1}^{n}\left(\frac{|S_i|}{|S|}H(S_i)\right)$$

$$I(X,S) = H(S) - H(X,S)$$

Analiza odlučivanja

$$MAXIMIN = \max_{a_i} \min_{s_j}\{p_{ij}\}$$

$$MAXIMAX = \max_{a_i} \max_{s_j}\{p_{ij}\}$$

$$KMV = \max_{a_i}\{p_{ij} *\}, s_j^* = \max\{p(s)\}$$

$$Laplas = \sum_{j=1}^{m} p_{ij} * V(s_j); V(s_j) = \frac{1}{m}$$

$$ONV(a_i) = \sum_{j=1}^{m} p_{ij} * V(s_j)$$

$$OŽ(a_i) = \sum_{j=1}^{m} ž_{ij} * V(s_j)$$

$$OVPI = \text{perf. slučaj} - \text{ONV}(a_i^*)$$

$$AO\ sa\ uzorkovanjem = \frac{v(s_j)v(X|s_j)}{\sum_{i=1}^{n} v(s_i)v(X|s_i)}$$

$$OR = \sum OŽ(a_j|X)v(X)$$

$$OVIU = OVPI - OR$$

$$OČDU = OVIU - troškovi$$

Ka sistemu za podršku odlučivanju

Frekvencija pojavljivanja → *sortirati*

→ $interval = \frac{br.\,sluč}{n}$

Jednaki intervali → $interval = \frac{max - min}{n}$

Aritmetička sredina → $\mu \pm n^*\rho$

Entropija → *sortirati*

→ *na svakoj promeni vred. ciljnog atributa izračunati* $I(X,S)$