Megadott paraméterek, összefüggések

$$I(P(v_1),\ldots,P v_K) = -\sum_{i=1}^{K} P(v_i)\cdot \log_2\left(P(v_i)\right)$$

$$M(A) = \sum_{i=1}^{N} \frac{n_{i,1}+\ldots+n_{i,N}}{n_1+\ldots+n_N}\cdot I(P(v_{i1}),\ldots,P(v_{iK}))$$

$$GR = \sum_{k=1}^{K} -\frac{p_k+n_k}{p+n}\cdot log_2(\frac{p_k+n_k}{p+n})$$

$$D = \sum_{i=1}^{k}\left(\frac{(p_i-\hat{p}_i)^2}{\hat{p}_i}+\frac{(n_i-\hat{n}_i)^2}{\hat{n}_i}\right)$$

$$R(T_n)+\alpha\cdot|T_n| = R(\{T_n\})+\alpha\cdot|\{T_n\}|$$

$$\Pr(y(\mathbf{x}_{teszt})\neq d_{teszt}) \;\leq\; \Pr(y(\mathbf{x}_{\text{tanító}})\neq d_{\text{tanító}}) \;+\; O(\sqrt{\frac{Td_{VC}}{N}})$$

$$U^{\pi}(s) = R(s)+\gamma \max_a \sum_{s'} T(s,a,s')U^{\pi}(s')$$

$$\pi^*(s) = \arg\max_a \sum_{s'} T(s,a,s')U(s')$$

$$U^{+}(s) \leftarrow R(s)+\gamma \max_a f\left(\sum_{s'} T(s,a,s')U^{+}(a',s'), N(a,s)\right)$$

$$Q(a,s) = R(s)+\gamma \max_a \sum_{s'} T(s,a,s')\max_{a'} Q(a',s')$$

$$\frac{1}{\varepsilon}\left(\ln(|H|)-\ln(\delta)\right)\leq N$$

$$\varepsilon_t = \sum_{\substack{i=1\\ y_t(\mathbf{x}_i)\neq d_i}}^{N} D_t(i)$$

$$h(\mathbf{x}) = sign(\sum_{t=1}^{T}\alpha_t h_t(\mathbf{x})) \qquad \alpha_t = \frac{1}{2}\ln(\frac{1-\varepsilon_t}{\varepsilon_t})$$

$$D^*_{t+1}(i) = \begin{cases} D_t(i)\cdot\exp(-\alpha_t) & \text{ha } h_t(\mathbf{x}_i)=d_i \\ D_t(i)\cdot\exp(+\alpha_t) & \text{ha } h_t(\mathbf{x}_i)\neq d_i \end{cases}$$

$$D_{t+1}(i) = \frac{D^*_{t+1}(i)}{\sum_{k=1}^{N} D^*_{t+1}(k)}$$

$$m(\mathbf{x}_k,d_k) = \frac{d_k\sum_t \alpha_t h_t(\mathbf{x}_k)}{\sum_t \alpha_t} = \frac{d_k\cdot h'(\mathbf{x}_k)}{\sum_t \alpha_t}$$

$$\Pr(h(\mathbf{x}_{teszt})\neq d_{teszt}) \;\leq\; \Pr(h(\mathbf{x}_{\text{tanító}})\neq d_{\text{tanító}}) \;+\; O(\sqrt{\frac{T\cdot d_{VC}}{N}})$$

$$\Pr(h(\mathbf{x}_{teszt})\neq d_{teszt}) \;\leq\; \Pr(|m(\mathbf{x}_{\text{tanító}},d_{\text{tanító}})|\leq\theta) \;+\; O(\sqrt{\frac{d_{VC}}{N\theta^2}})$$

$$\Pr(h(\mathbf{x})\neq d)\leq \prod_t [2\sqrt{\varepsilon_t(1-\varepsilon_t)}\,] = \prod_t \sqrt{1-4\gamma_t^2}\leq e^{-2\sum_t \gamma_t^2}$$

$$\Pr(h(\mathbf{x})\neq d)\leq e^{-2T\gamma^2}$$

$$y = \mu = \sum_{k=1}^{K} g_k\mu_k$$

$$g_i^{(\ell)} = \frac{e^{f_i(\mathbf{v}_i^{\mathbf{T}}\mathbf{x}^{(\ell)})}}{\sum_{k=1}^{K} e^{f_k(\mathbf{v}_k^{\mathbf{T}}\mathbf{x}^{(\ell)})}}$$

$$h_i^{(\ell)} = \frac{g_i^{(\ell)}P(y^{(\ell)}|\mathbf{x}^{(\ell)},\mathbf{\Theta}_i)}{\sum_j g_j^{(\ell)}P(y^{(\ell)}|\mathbf{x}^{(\ell)},\mathbf{\Theta}_j)}$$

$$\frac{\partial L}{\partial \mu_i} = \frac{g_i^{(\ell)}}{\sum_j g_j^{(\ell)}P(y^{(\ell)}\,|\,\mathbf{x}^{(\ell)},\theta_j)}\cdot\frac{\partial}{\partial\mu_i}P(y^{(\ell)}\,|\,\mathbf{x}^{(\ell)},\theta_i)$$

$$\frac{\partial L}{\partial \mathbf{\Theta}_i} = h_i^{(\ell)}\cdot\frac{(y^{(\ell)}-\boldsymbol{\mu}_i^{(\ell)})\mathbf{x}^{(\ell)}}{\sigma_i^2}$$

$$\frac{\partial L}{\partial \mathbf{v}_i} = (h_i^{(\ell)}-g_i^{(\ell)})\cdot\mathbf{x}^{(\ell)}$$

$$\mathbf{R}(\mathbf{w})\leq \mathbf{R_{emp}}(\mathbf{w})+\frac{\varepsilon(h)}{2}\sqrt{1+\frac{4\cdot\mathbf{R_{emp}}(\mathbf{w})}{\varepsilon(h)}}$$

$$\varepsilon(h) = 4\cdot\frac{\ln(2\frac{L}{h}+1)-\ln(\frac{\eta}{4})}{L/h}$$

$$E\left\{z_i^{(\ell)}(t+1)\right\} = \hat{P}\left(i \middle| x^{(\ell)}, \boldsymbol{\theta}(t+1)\right) = \frac{\frac{1}{\hat{\sigma}_i(t)} e^{-\frac{(x^{(\ell)}-\hat{\mu}_i(t))^2}{2\cdot\hat{\sigma}_i(t)^2}} \hat{P}_i(t)}{\sum_{j=1}^{K} \frac{1}{\hat{\sigma}_j(t)} e^{-\frac{(x^{(\ell)}-\hat{\mu}_j(t))^2}{2\cdot\hat{\sigma}_j(t)^2}} \hat{P}_j(t)}$$

$$\hat{\mu}_i(t+1) = \frac{\sum_{\ell=1}^{L} E\left\{z_i^{(\ell)}(t+1)\right\} \cdot x^{(\ell)}}{\sum_{\ell=1}^{L} E\left\{z_i^{(\ell)}(t+1)\right\}}$$

$$\hat{\sigma}_i(t+1)^2 = \frac{\sum_{\ell=1}^{L} E\left\{z_i^{(\ell)}(t+1)\right\} \cdot (x^{(\ell)} - \hat{\mu}_i(t+1))^2}{\sum_{\ell=1}^{L} E\left\{z_i^{(\ell)}(t+1)\right\}}$$

$$\hat{P}_i(t+1) = \frac{1}{L}\sum_{\ell=1}^{L} \hat{P}\left(i \middle| x^{(\ell)}, \boldsymbol{\theta}(t+1)\right) = \frac{1}{L}\sum_{\ell=1}^{L} E\left\{z_i^{(\ell)}(t+1)\right\}$$

$$f = \max_k \frac{(\mu_{1k} - \mu_{2k})^2}{\sigma_{1k}^2 + \sigma_{2k}^2}$$

$$\mathrm{Min\_Bet} = \min_{\substack{k=1,2,\ldots,|{}_{+}C| \\ \ell=1,2,\ldots,|{}_{-}C|}} \left\{ \frac{\sum_{i=1}^{{}_{+}m_k} \sum_{j=1}^{{}_{-}m_\ell} d\left({}_{+}x_i^{(k)}, {}_{-}x_j^{(\ell)}\right)}{{}_{+}m_k \cdot {}_{-}m_\ell} \right\} \quad ; \quad \mathrm{Within}_{+} = \sum_{k=1}^{|{}_{+}C|} \left\{ \frac{\sum_{i=1}^{{}_{+}m_k} \sum_{j=1}^{{}_{+}m_k} d\left({}_{+}x_i^{(k)}, {}_{+}x_j^{(k)}\right)}{{}_{+}m_k \cdot \left({}_{+}m_k - 1\right)} \right\}$$

$$CBE = \frac{Min\_Bet}{\frac{Within_{+} + Within_{-}}{|{}_{+}C| + |{}_{-}C|}}$$

χ^2 táblázat

SzF	$\mathbf{P_{0,5}}$	$\mathbf{P_{0,2}}$	$\mathbf{P_{0,1}}$	$\mathbf{P_{0,05}}$	$\mathbf{P_{0,01}}$	$\mathbf{P_{0,005}}$	$\mathbf{P_{0,001}}$
1	0,46	1,64	2,71	3,84	6,64	7,88	10,83
2	1,39	3,22	4,61	5,99	9,21	10,60	13,82
3	2,37	4,64	6,25	7,82	11,35	12,84	16,27
4	3,36	5,99	7,78	9,49	13,28	14,86	18,47
5	4,35	7,29	9,24	11,07	15,09	16,75	20,52
6	5,35	8,56	10,65	12,59	16,81	18,55	22,46
7	6,35	9,80	12,02	14,07	18,48	20,28	24,32
8	7,34	11,03	13,36	15,51	20,09	21,96	26,12
9	8,34	12,24	14,68	16,92	21,67	23,59	27,88
10	9,34	13,44	15,99	18,31	23,21	25,19	29,59