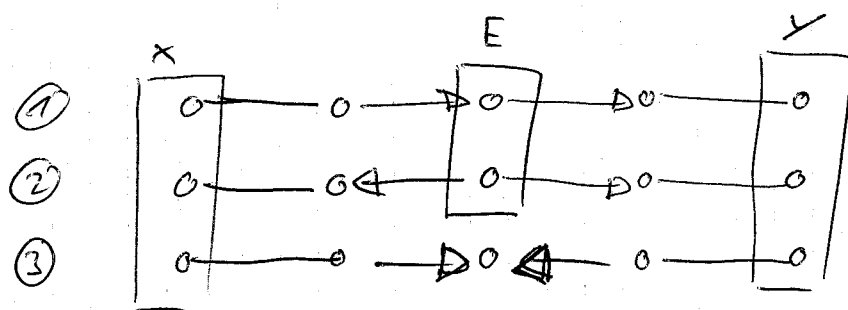


A1 U 11

Ex 6.2. f.)

$$\boxed{u} \rightarrow w \rightarrow y \leftarrow x \rightarrow \boxed{z} \quad (3)$$

$$\boxed{u} \rightarrow \underline{w} \leftarrow v \rightarrow x \rightarrow \boxed{z} \quad (3)$$



$$I(P(v_1), \dots, P(v_n)) = \sum_{i=1}^n -P(v_i) \log_2(P(v_i))$$

$$\text{Remainder}(A) = \sum_{i=1}^n \frac{p_i + n_i}{p + n} \cdot I\left(\frac{p_i}{p + n_i}; \frac{n_i}{p + n_i}\right)$$

$$\text{Gain}(A) = I\left(\frac{p}{p+n}; \frac{n}{p+n}\right) - \text{Remainder}(A)$$

$$p=5 \quad n=3: \quad I\left(\frac{5}{8}; \frac{3}{8}\right) = -\frac{5}{8} \cdot \log_2\left(\frac{5}{8}\right) - \frac{3}{8} \log_2\left(\frac{3}{8}\right) \\ \approx 0,9544$$

A₁ = country

$$1.) \text{ Italy} : p_1=2 \quad n_1=0 \quad I(1,0)=0$$

$$2.) \text{ Austria} : p_2=1 \quad n_2=2 \quad I\left(\frac{1}{3}; \frac{2}{3}\right) \approx 0,918$$

$$3.) \text{ Spain} : p_3=2 \quad n_3=1 \quad I\left(\frac{2}{3}; \frac{1}{3}\right) \approx 0,918$$

$$R(A_1) = \frac{2}{8} \cdot 0 + \frac{3}{8} \cdot 0,918 + \frac{3}{8} \cdot 0,918 = 0,689$$

$$G(A_1) = 0,9544 - 0,689 = 0,2654$$

$A_2 = \text{season:}$

1.) summer	$p_1 = 3$	$n_1 = 0$	$I(1, 0) = 0$
2.) winter	$p_1 = 2$	$n_2 = 3$	$I(\frac{2}{5}; \frac{3}{5}) \approx 0,971$

~~W~~

$$R(A_2) = \frac{3}{8} \cdot 0 + \frac{5}{8} \cdot 0,971 \approx 0,607$$

$$G(A_2) \approx 0,3474$$

$A_3 = \text{type:}$

1.) repose	$p_1 = 2$	$n_1 = 2$	$I(\frac{1}{2}; \frac{1}{2}) = 1$
2.) sports	$p_2 = 3$	$n_2 = 0$	$I(1, 0) = 0$
3.) culture	$p_3 = 0$	$n_3 = 1$	$I(0, 1) = 0$

$$R(A_3) = \frac{4}{8} \cdot 1 + \frac{3}{8} \cdot 0 + \frac{1}{8} \cdot 0 = \frac{1}{2}$$

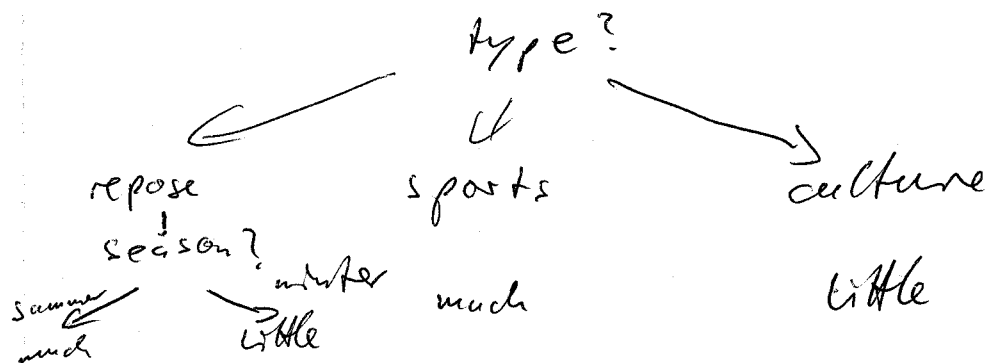
$$G(A_3) \approx 0,544$$

$A_4 = \text{weeks:}$

1.) 1	$p_1 = 2$	$n_1 = 1$	$I(\frac{2}{3}; \frac{1}{3}) \approx 0,918$
2.) 2	$p_2 = 2$	$n_2 = 1$	$I(\frac{2}{3}; \frac{1}{3}) \approx 0,918$
3.) 3	$p_3 = 1$	$n_3 = 1$	$I(\frac{1}{2}; \frac{1}{2}) = 1$

$$R(A_4) = \frac{3}{8} \cdot 0,918 + \frac{3}{8} \cdot 0,918 + \frac{1}{4} \cdot 1 \approx 0,9385$$

$$G(A_4) \approx 0,0159$$



$$A_3 = \text{repose: } p = 2 \quad u = 2 \quad I\left(\frac{1}{2}; \frac{1}{2}\right) = 1$$

$$A_1: \begin{array}{lll} 1.) \text{ Italy} & p_1 = 1 & u_1 = 0 \quad I(1; 0) = 0 \\ 2.) \text{ Austria} & p_2 = 0 & u_2 = 1 \quad I(0; 1) = 0 \\ 3.) \text{ Spain} & p_3 = 1 & u_3 = 1 \quad I\left(\frac{1}{2}; \frac{1}{2}\right) = 1 \end{array}$$

$$R(A_1) = \frac{1}{4} \cdot 0 + \frac{1}{4} \cdot 0 + \frac{2}{4} \cdot 1 = \frac{1}{2}$$

$$G(A_1) = 0,5$$

$$A_2: \begin{array}{lll} 1.) \text{ summer} & p_1 = 2 & u_1 = 0 \quad I(1; 0) = 0 \\ 2.) \text{ winter} & p_2 = 0 & u_2 = 2 \quad I(0; 1) = 0 \end{array}$$

$$R(A_2) = 0$$

$$G(A_2) = \text{[scribbled out]}$$

G.H.G.)

example $I_A \quad I_B \quad I_V \quad I \quad I. \quad \sim$

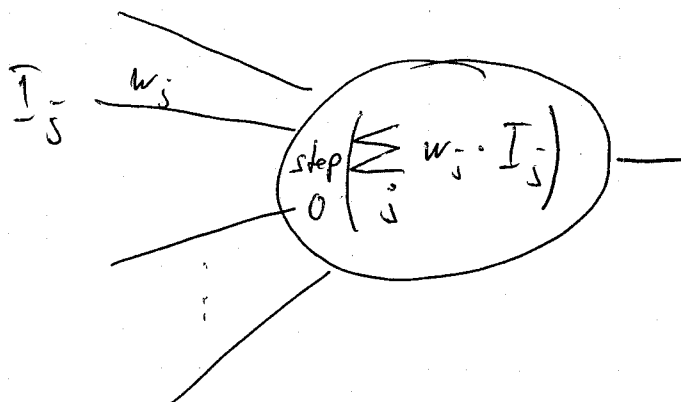
1
2
3
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outline

b.)

attribute	encoding
brand	distributed
persons	local
attitude	local
gender	local local
parking	distributed

c.)



$$w_j \leftarrow w_j + \alpha \cdot I_j \cdot \text{Error}$$

\uparrow
 Learning rate

$$\text{Error} = T - O$$

T correct output (example)

O observed output

Step 1: ex 1:

$$\begin{aligned}
 O &= \text{step}_0 \left(\sum_j w_j I_j \right) = \\
 &= \text{step}_0 (1.0 + 1.0 + 1.1 + 1.2 + 1.1 + 1.1 + 1.0 + 1.0) \\
 &= \text{step}_0 (5) \\
 &= 1
 \end{aligned}$$

A1 $\vec{u} = 11$

$$\text{ep1 ex2: } \sigma = \text{stepo}(1 \cdot 1 + 1 \cdot 3 + 1) = 1$$

$$\text{Error} = \sigma - 1 = -1$$

$$w_B \leftarrow 1 + 2 \cdot 1 \cdot \overset{\alpha}{\underset{\bar{I}_j}{-1}} \cdot \overset{\text{Error}}{(-1)} = -1$$

$$w_{\#} \leftarrow 1 + 2 \cdot 3 \cdot (-1) = -5$$

$$w_b \leftarrow 1 + 2 \cdot 1 \cdot (-1) = -1$$

$$\text{ep1 ex3: } \sigma = \text{stepo}((-1) \cdot 1 + (-5) \cdot 1 + 1 \cdot 1) \\ = 0$$

