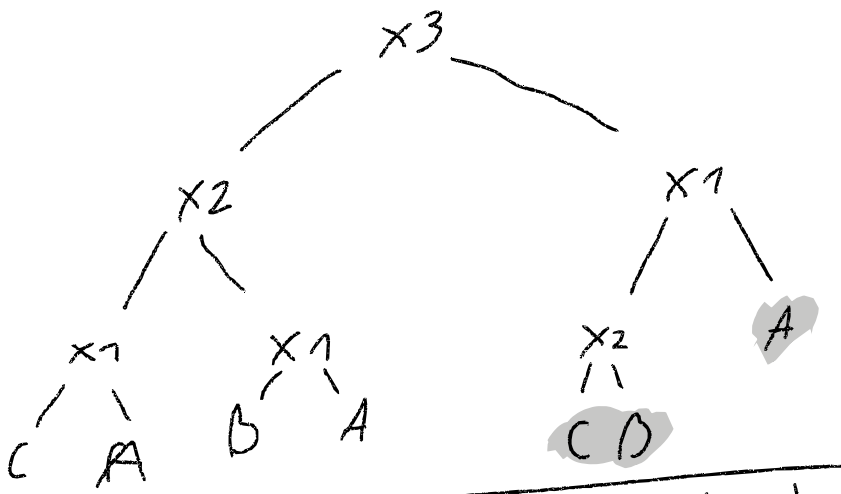
2.

$x_3(x_2(x_1(C,A), x_1(B,A)), x_1(x_2(C,B), A))$



Regeln:

$x_1(A,A) \Rightarrow A$

$x_1(A, x_2(A,B)) \Rightarrow x_2(A,B)$

$x_1(x_1(A,B), A) \Rightarrow x_1(A,B)$

$x_2(x_1(A,A), A) \Rightarrow A$

$x_1(A, x_1(B,C)) \Rightarrow x_1(A,B,C)$

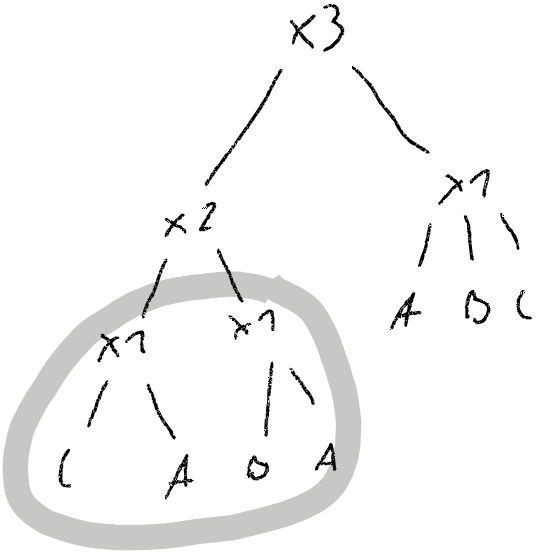
1. | S1 Eliminierung redundanter Tests

$x_1(x_2(C,B), A) \Rightarrow x_1(A,B,C)$

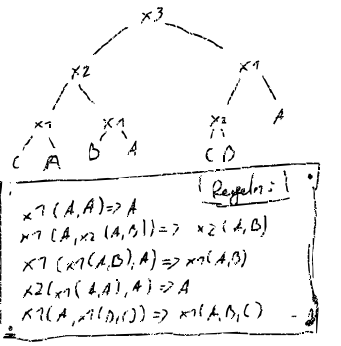
$\Rightarrow$

$x_3(x_2(x_1(C,A), x_1(B,A)), x_1(A,B,C))$

2.|3| Vereinfachung überflüssiger Teile



$x_3(x_2(x_1(C,A), x_1(B,A)), x_1(x_2(C,B),A))$



Regeln:

$x_1(A,A) \Rightarrow A$

$x_1(A, x_2(A,B)) \Rightarrow x_2(A,B)$

$x_1(x_1(A,B),A) \Rightarrow x_1(A,B)$

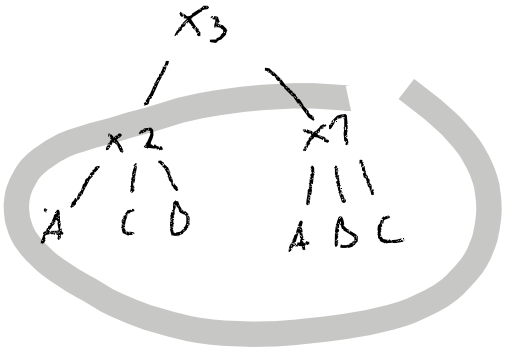
$x_2(x_1(A,A),A) \Rightarrow A$

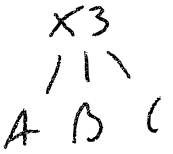
$x_1(A, x_1(B,C)) \Rightarrow x_1(A,B,C)$

2.|5|

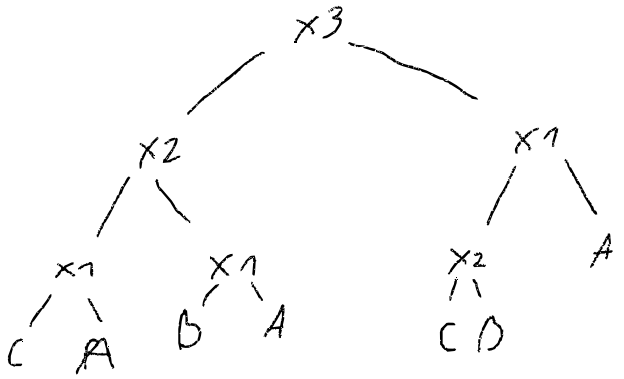
$x_1(x_2(C,B),A) \Rightarrow x_1(A,B,C)$

$\Rightarrow x_3(x_2(x_1(C,A), x_1(B,A)), x_1(A,B,C))$





(2) $x_3(x_2(x_1(C,A),x_1(B,A)),x_1(x_2((D),A))$



1. Allgemeine Transformationsregel

$x_1(x_2(a,b),x_2(c,d)) \Leftrightarrow x_2(x_1(a,c),x_1(b,d))$

---

2. Bedingte irrelevante Attribute

$x_1(A,D),x_2(A,D),x_2(A,B)) \Rightarrow x_2(A,B)$

---

1. $x_2(x_1((,A),x_1(B,A)) \Rightarrow (x_1(x_2((,B),x_2(A,A))$

2. $x_1(x_2((,D),x_2(A,A)) \Rightarrow x_1(x_2((,B),A)$

2. $x_3(x_1(x_2((,B),A),x_1(x_2((,D),A))$

2. $x_3(x_1(x_2((,D),A)$

$x_3(x_2(,D)A$

Nr.	Alter	Eink.	Bil	Kredi
1	≥35	hoch	Abi	O
2	<35	niedrig	Mas	O
3	≥35	hoch	Bach	M
4	≥35	niedrig	Abi	M
5	≥35	hoch	Mas	O
6	<35	hoch	Bach	O
7	<35	niedrig	Abi	M

$S_1 = 4$

$S_2 = 0,7$

≥35 = 1

hoch = 1

Abi = 1

Mas = 2

Bach -

1 /01/

2 /02/

3 /02M1/

4 /02M2/

$P(A) = \frac{3}{4} = 0,3$ (O) $P(B) = \frac{2}{4}$ (M)

< 0,7 → Differenzieren

<35 | ≥35

x1(01, |01, M2|)

---

5. x1(01, |02, M2|) $P(O) = 0,5 > 0,7$

<35 ≥35

hoch niedrig

x1(01, x2(|02M1|, |*, M1|)

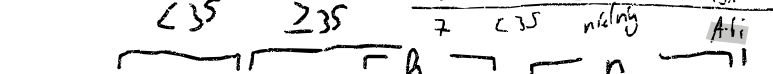
6. x1(02, x2(|02M1|, |*, M1|)

7 → x1(02M1, x2(|02M1|, |*, M1|)

1. x1(02M1, x2(|03M1|, |*, M1|) hoch!

x1(02M1, x2(0, |*, M1|)

Nr.	Alter.	Eink.	Bil	Kondi
1	≥35	hoch	Abi	0
2	<35	niedrig	Maj	0
3	≥35	hoch	Bach	M
4	≥35	niedrig	Abi	M
5	≥35	hoch	Maa	0
6	<35	hoch	BA	0
7	<35	niedrig	Abi	M



x1(02M1, x2(0 , 1*, M1|)

---

2. x1(03M1, x2(0, 1*, M1|)

   x1(0, x2 (0, 1*, M1|)

3. x1(0, x2 (0, 1*, M1|)

4. x1(0, x2 (0, 1*, M2|)

5. x1(0, x2 (0, 1*, M2|)

---

6. ...

7 ...

1. ...

2. ...

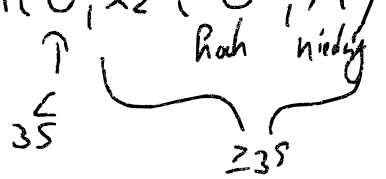
3. ...

4. ...

... x1(0, x2(0, 1*, M3)

M4

x1(0, x2(0, M)



1. 103

$$Entropy(S) = -\sum_i p_i \cdot \log_2(p_i)$$

$$Gains(S,A) = Entropy(S) - \sum_{v \in Values(A)} \frac{|S_v|}{|S|} \cdot Entropy(S)$$

O: 4 (1, 2, 5, 6)

M: 3 (3, 4, 7)

$$Entropy(S) = -\left(\frac{4}{7}\log_2\frac{4}{7} + \frac{3}{7}\log_2\frac{3}{7}\right) \approx 0{,}985$$

	O	M	
< 35	2	1	$-\left(\frac{2}{3}\log_2\frac{2}{3} + \frac{1}{3}\log_2\frac{1}{3}\right) = 0.918$
≥ 35	2	2	$-\left(\frac{1}{2}\log_2\frac{1}{2} + \frac{1}{2}\log_2\frac{1}{2}\right) = 1.0$

$$Gains(S, Alter) = 0{,}985\left(\frac{3}{7} \cdot 0{,}918 + \frac{4}{7} \cdot 1.0\right) =$$

$$0{,}985 - 0.964 = 0{,}021$$

Informationsgewinn 0,021

Einkommen

	hoch	niedrig	
	O	M	
hoch	3	1	$-\left(\frac{3}{4}\log_2\frac{3}{4}+\frac{1}{4}\log_2\frac{1}{4}\right)=0{,}811$
niedrig	1	2	$-\left(\frac{1}{3}\log_2\frac{1}{3}+\frac{2}{3}\log_2\frac{2}{3}\right)=0{,}918$

$$0{,}985-\left(\frac{4}{7}\cdot 0{,}811+\frac{3}{7}\cdot 0{,}918\right)$$

Bildung

	O	M	
Abi	1	2	$0{,}918-\left(\frac{1}{3}\log_2\frac{1}{3}+\frac{2}{3}\log_2\frac{2}{3}\right)$
Mast	1	1	1,0
Buch	2	0	0,0

$$-\left(P(O)\cdot\log_2(p(O))+p(M)\cdot\log_2(P(M))\right)$$

$$G(S,\text{Bildung})=0{,}985-\left(\frac{3}{7}\cdot 0{,}918+\frac{2}{7}\cdot 1{,}0+\frac{2}{7}\cdot 0{,}0\right)=$$

$$0{,}985-0{,}681=\underline{0{,}304}$$