Spieltheorie - Übungsblatt 4

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Aufgabe 4.1:

(a)

$G =< \{1,2\}, \{\{0,...,4\}, \{0,...,4\}\}, (U_i) >$ mit U_i:

	0	1	2	3	4
0	$0,0$	$1,2$	$1,3$	$1,4$	$1,5$
1	$2,1$	$0,0$	$2,3$	$2,4$	$2,5$
2	$3,1$	$3,2$	$0,0$	$3,4$	$3,5$
3	$4,1$	$4,2$	$4,3$	$0,0$	$4,5$
4	$5,1$	$5,2$	$5,3$	$5,4$	$0,0$

LCP:
$u - 0 \cdot \beta(1) - 1 \cdot \beta(2) - 1 \cdot \beta(3) - 1 \cdot \beta(4) - 1 \cdot \beta(5) \geq 0$
$u - 2 \cdot \beta(1) - 0 \cdot \beta(2) - 0 \cdot \beta(3) - 0 \cdot \beta(4) - 0 \cdot \beta(5) \geq 0$
...
$v - 0 \cdot \alpha(1) - 1 \cdot \alpha(2) - 1 \cdot \alpha(3) - 1 \cdot \alpha(4) - 1 \cdot \alpha(5) \geq 0$
$v - 2 \cdot \alpha(1) - 0 \cdot \alpha(2) - 0 \cdot \alpha(3) - 0 \cdot \alpha(4) - 0 \cdot \alpha(5) \geq 0$
...
$\alpha(0) \cdot (u - 0 \cdot \beta(1) - 1 \cdot \beta(2) - 1 \cdot \beta(3) - 1 \cdot \beta(4) - 1 \cdot \beta(5)) \geq 0$
$\alpha(1) \cdot (u - 2 \cdot \beta(1) - 0 \cdot \beta(2) - 0 \cdot \beta(3) - 0 \cdot \beta(4) - 0 \cdot \beta(5)) \geq 0$
...
$\beta(0) \cdot (v - 0 \cdot \alpha(1) - 1 \cdot \alpha(2) - 1 \cdot \alpha(3) - 1 \cdot \alpha(4) - 1 \cdot \alpha(5)) \geq 0$
$\beta(1) \cdot (v - 2 \cdot \alpha(1) - 0 \cdot \alpha(2) - 0 \cdot \alpha(3) - 0 \cdot \alpha(4) - 0 \cdot \alpha(5)) \geq 0$
...
$\alpha(0) \geq 0$
$\alpha(1) \geq 0$
...
$\beta(0) \geq 0$
$\beta(1) \geq 0$
...
$\alpha(0) + \alpha(1) + \alpha(2) + \alpha(3) + \alpha(4) = 1$
$\beta(0) + \beta(1) + \beta(2) + \beta(3) + \beta(4) = 1$

(b)

(1) Spieler 1: 4 -> 1.0, Payoff: 5.0; Spieler 2: 3 -> 1.0, Payoff: 4.0
(2) Spieler 1: 3 -> 1.0, Payoff: 4.0; Spieler 2: 4 -> 1.0, Payoff: 5.0
(3) Spieler 1: 3 -> 0.6, 4 -> 0.4, Payoff: 4.0; Spieler 2: 2 -> 0.8, 4 -> 0.2, Payoff: 3.0
(4) Spieler 1: 2 -> 0.8, 4 -> 0.2, Payoff: 3.0; Spieler 2: 3 -> 0.6, 4 -> 0.4, Payoff: 4.0
(5) Spieler 1: 2 -> 0.149, 3 -> 0.362, 4 -> 0.489; Payoff: 2.553; Spieler 2: 2 -> 0.149, 3 -> 0.362, 4 -> 0.489, Payoff: 2.553

Aufgabe 4.2:

(a)

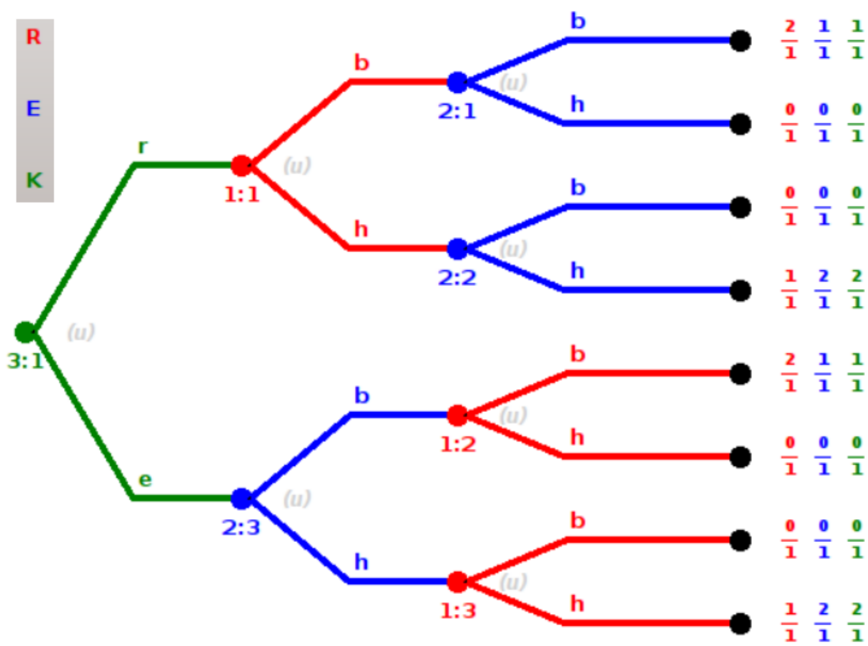

Abbildung 1: Spielbaum

$\Gamma =< N, H, P, (u_i) >$ mit:
$N = \{R, E, K\}$,
$H = \{<>, < r >, < e >, < r, b >, < r, h >, < e, b >, < e, h >, < r, b, b >, < r, b, h >, < r, h, b >, < r, h, h >, < e, b, b >, < e, b, h >, < e, h, b >, < e, h, h >\}$
$P(<>) = K$
$P(< r >) = P(< e, b >) = P(< e, h >) = R$
$P(< e >) = P(< r, b >) = P(< r, h >) = E$
$u_R(< r, b, b >) = 2$, $u_E(< r, b, b >) = u_K(< r, b, b >) = 1$
$u_R(< r, b, h >) = 0$, $u_E(< r, b, h >) = u_K(< r, b, h >) = 0$

$u_R(< r, h, b >) = 0,\; u_E(< r, h, b >) = u_K(< r, h, b >) = 0$
$u_R(< r, h, h >) = 1,\; u_E(< r, h, h >) = u_K(< r, h, h >) = 2$
$u_R(< e, b, b >) = 2,\; u_E(< e, b, b >) = u_K(< e, b, b >) = 1$
$u_R(< e, b, h >) = 0,\; u_E(< e, b, h >) = u_K(< e, b, h >) = 0$
$u_R(< e, h, b >) = 0,\; u_E(< e, h, b >) = u_K(< e, h, b >) = 0$
$u_R(< e, h, h >) = 1,\; u_E(< e, h, h >) = u_K(< e, h, h >) = 2$

(b)

$S_R = \{bbb, bbh, bhb, bhh, hbb, hbh, hhb, hhh\}$

(c)

$s^* = (s_K = e,\; s_R = bbh,\; s_E = hbh)$