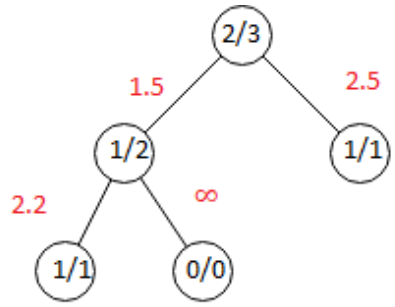
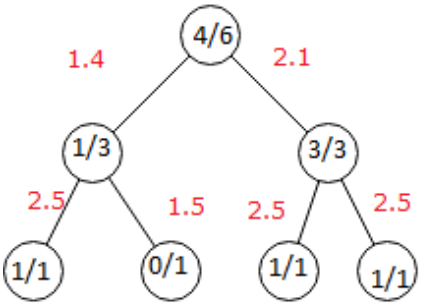
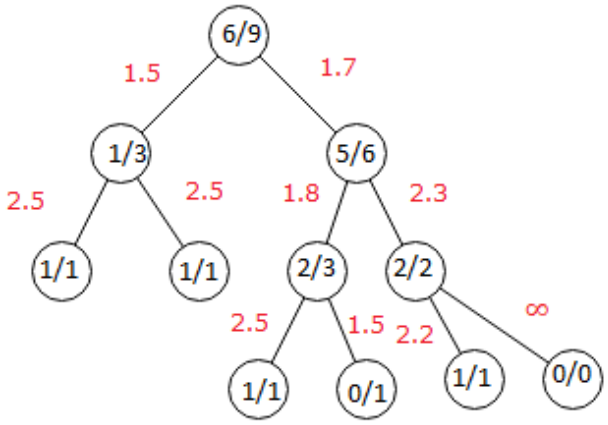
Kevin Dunn

4511W HW # 3

1.







2. (1) no pure Nash equilibrium

(2) Player 1, P = 87.5%

Expected 4.625

Player 2, P = 37.5%

Expected 2.75

(3) (9,1), (2,8)

(4)

3. (1) 0k: {(t = 0 ∨ t = 120)}

4k: $\{(10 \leq t \leq 110) \wedge (t > 0k_t + 10) \wedge (t > 8k_t - 10)\}$

8k: $\{(20 \leq t \leq 100) \wedge (t > 4k_t + 10) \wedge (t > 12k_t - 10)\}$

12k: $\{(30 \leq t \leq 90) \wedge (t > 8k_t + 10) \wedge (t > 16k_t - 10)\}$

16k: $\{(40 \leq t \leq 80) \wedge (t > 12k_t + 10)\}$

(2) 0k: {(t = 0 ∨ t = 120)}

4k: $\{(10 \leq t \leq 110) \wedge (t > 0k_t + 10) \wedge (t > 8k_t - 10) \wedge (t \neq t + 20)\}$

8k: $(20 \leq t \leq 100) \wedge (t > 4k_t + 10) \wedge (t > 12k_t - 10) \wedge (t \neq t + 20)$

12k: $\{(30 \leq t \leq 90) \wedge (t > 8k_t + 10) \wedge (t > 16k_t - 10) \wedge (t \neq t + 20)\}$

16k: $\{(40 \leq t \leq 80) \wedge (t > 12k_t + 10) \wedge (\neg 50 \vee \neg 60) \wedge (t \neq t + 20)\}$

(3) 0k: {0, ~~10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120}

4k: {~~0~~, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120~~}

8k: {~~0~~, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120~~}

12k: {~~0~~, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120~~}

16k: {~~0~~, 10, 20, 30, 40~~, 50, 60~~, 70, 80, 90, 100, 110,~~ 120~~}

(4) 0k: {0, ~~10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120}

4k: {~~0~~, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120~~}

8k: {~~0, 10,~~ 20, 30, 40, 50, 60, 70, 80, 90, 100, ~~110, 120~~}

12k: {~~0, 10, 20, 30,~~ 40, 50, 60, 70, 80, 90~~, 100, 110, 120~~}

16k: {~~0, 10, 20, 30,~~ 40, ~~50, 60~~, 70, 80~~, 90, 100, 110, 120~~}

(5) 0k: {0, ~~10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120}

4k: {~~0~~, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110,~~ 120~~}

8k: {~~0, 10,~~ 20, 30, 40, 50, 60, 70, 80, 90, 100, ~~110, 120~~}

12k: {~~0, 10, 20, 30,~~ 40, 50, 60, 70, 80, 90~~, 100, 110, 120~~}

16k: {~~0, 10, 20, 30, 40, 50, 60~~, 70, 80~~, 90, 100, 110, 120~~}

(6)

Time	0	10	20	30	40	50	60	70	80	90	100	110	120
Height	0k	4k	8k	12k	12k	12k	12k	16k	16k	12k	8k	4k	0k

4. At each level there are 2^d nodes. On each level you can eliminate 1 branch out of every pair except for the first 2 branches on each level. This means you can eliminate $\frac{2^{d-1}-1}{2^d}$ branches from each level. There are d levels in a tree, so $\sum_{k=1}^{d} \frac{2^{k-1}-1}{2^k} = \frac{d}{2} + 2^{-d} - 1$.

5. (1) 10 cheaters 15 simpletons

(2)

Mistake	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Dominant	S	S	C	C	C	C	C	C	C	C	C