

## HW # 2 : CSE 160

2.41 - a)  $K_A = 0, 1$   
 $K_B = 0, 1, 2, 3$

$5/8 = 0.625$

A will win if  $(K_A, K_B)$  is in the form:

- $(0, 1)$
- $(0, 2)$
- $(0, 3)$
- $(1, 2)$
- $(2, 3)$

b)  $A = A_4 \quad K_A = 0, 1$        $B = B_1 \quad K_B = 0, 1, 2, 3, 4, 5, 6, 7$

$(0, 1), (0, 2), (0, 3), (0, 4), (0, 5), (0, 6)$
$(0, 7)$
$(1, 2), (1, 3), (1, 4), (1, 5), (1, 6)$
$(1, 7)$

$7+6=13 = [13/16 = 0.8125]$

c)  $n^{\text{th}} \text{ race} = \left( \frac{1}{2^{n-1}} \right)$  after the first 3  
 $\geq \left( 1 - \frac{1}{2^3} \right) \left( 1 - \frac{1}{2^4} \right) \left( 1 - \frac{1}{2^5} \right) \left( 1 - \frac{1}{2^6} \right)$   
 $\geq \left( 1 - \frac{1}{8} \right) \left( 1 - \frac{1}{16} \right) \left( 1 - \frac{1}{32} \right) \left( 1 - \frac{1}{64} \right)$   
 $\geq (7/8)(15/16)(31/32)(63/64) = 3/4$

d) A's frame is numbered as  $(A_1, A_2)$  and so on, similarly B's frame is numbered as  $B_1, B_2$  and so on. After the continuous defeat of  $B_1$ , B gives it up and starts again with  $B_2$ . This is Ethernet capture effect