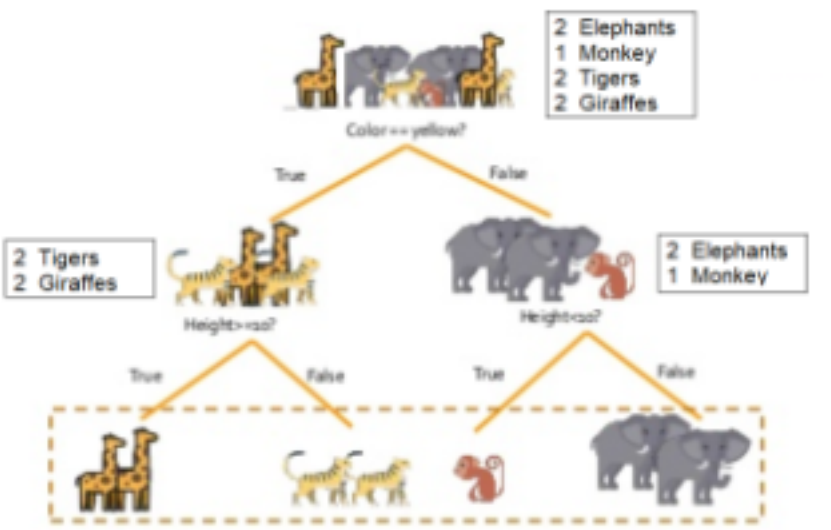
Table 1

Total = 7			
Level 1: Impurity of root			
Imp = P(E)*(1-P(E)) + P(M)*(1-P(M)) + P(T)*(1-P(T)) + P(G)*(1-P(G))			
= (2/7)*(1-2/7) + (1/7)*(1-1/7) + (2/7)*(1-2/7) + (2/7)*(1-2/7)			
(2/7)*(1-2/7) + (1/7)*(1-1/7) + (2/7)*(1-2/7) + (2/7)*(1-2/7)			
=0.28*0.71 + 0.14*0.85 + 0.28*0.71 + 0.28*0.71			
0.7154			
Avg Imp = 7/7 * imp = 7/7 * 0.7154			
0.7154			
Level 2: Impurity			
Left subtree:		Left subtree:	
Imp = P(T)*(1-P(T)) + P(G)*(1-P(G))		Imp = P(E)*(1-P(E)) + P(M)*(1-P(M))	
(2/4)*(1-2/4) + (2/4)*(1-2/4)		(2/3)*(1-2/3) + (1/3)*(1-1/3)	
0.5		0.444444444444444	
Avg Imp = 4/7 * imp + 3/7 * imp = 4/7 * 0.5 + 3/7 * 0.44			
0.474285714285714			
Information Gain in 2 levels:			
Info Gain = Ave Imp. of Level 1 - Ave Imp. of Level 2			
0.7154 - 0.4743			
0.2411			
Level 3: Impurity			
Left subtree -> leftmost leaf:		Right subtree -> leftmost leaf:	
Imp = P(G)*(1-P(G)) = (2/2)*(1-2/2)		Imp = P(M)*(1-P(M)) = (1/1)*(1-1/1)	
0		0	
Left subtree -> rightmost leaf:		Right subtree -> rightmost leaf:	
Imp = P(T)*(1-P(T)) = (2/2)*(1-2/2)		Imp = P(E)*(1-P(E)) = (2/2)*(1-2/2)	
0		0	
Avg Imp = 2/7 * imp + 2/7 * imp + 1/7 * imp + 2/7 * imp = 0			



Information Gain in 3 levels:			
Info Gain = Ave Imp. of Level 1 - Ave Imp. of Level 2 - Ave Imp. of Level 3			
0.7154 - 0.4743 - 0			
0.2411			
Total Information Gain from 3 levels is 0.2411			

Table 1
