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CSE-4308-002

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Assignment 4

1. a) 5 \* 710

b) 5 + 710

1. Programming task
2. A close up of text on a white background

   Description automatically generated
3. Leaf node: George feeds the cat

Decision tree output: No baseball game, George doesn’t watch TV, George is not out of cat food, George feeds the cat

1. a) A close up of a piece of paper

   Description automatically generated

b) (0.8\*0.8)/0.8 = 0.8

c) (P(N|I) \* P(not(D)) \* P(I))/P(I)

(0.1\*0.5)/0.5 = 0.1

1. Entropy = -5/10log2(5/10) – 5/10log2 (5/10) = 1

A = 1 - (3/10(-3/3log2(3/3) – 0)) – (4/10(-1/4log2(1/4) - 3/4log2(3/4))) - (3/10(-1/3log2(1/3) – 2/3log2(2/3))) = 0.4

B = 1 - (4/10(-1/4log2(1/4) – 3/4 log2(3/4))) – (4/10(-3/4log2(3/4) - 1/4log2(1/4))) - (2/10(-1/2log2(1/2) – 1/2log2(1/2))) = 0.15

C = 1 - (5/10(-1/5log2(1/5) – 4/5log2(4/5))) – (4/10(-3/4log2(3/4) - 1/4log2(1/4))) - (0) = 0.31

A has the highest information gain at the root

1. a)Entropy = -80/100log2(80/100) – 20/100log2(20/100) = 0.72

b)0.72 – (35/100(-20/35log2(20/35) – 15/35log2(15/35)) + 65/100(-60/65log2(60/65) – 5/65log2(5/65))) = .2522

c) 0.72

d) will wait

Node A, Node B, Node D