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Intro to AI
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1. Q1

a. Part 1

- p(F) = 0.6
- p(S) = 0.7
- p(T) = 0.8

1 – p(!F) * p(!S) * p(!T) =
1 – 0.4 * 0.3 * 0.2 =
0.976 or 97.6 %

b. Part 2

p(N >= 2) = p(N >= 1) – p(N = 1)
p(N = 1) = p(f)(!s)(!t) + p(!f)p(s)p(!t) + p(f)(!s)(!t)
= 0.788 or 78.8%

2. Q2

P(S >= 800) = 0.2
N = num of robots
P(N >= 1) = 1 – p(N = 0)
1 – p(S >= 800) = 0.8
$S^5 = 0.8^5 = 0.723$ or 72.3%

3. Q4

p(A|C) = p(A) and p(C|A) = p(C)
p(B|C) = p(B) and p(C|B) = p(C)
p(A|B) = 0 and p(B|A) = 0
p(A or C) = ⅔
p(B or C) = ¾
p(A or B or C) = 11/12

p(A) + p(B) + p(C) - p(A & B) - p(C & B) - p(A & C) + p(A & B & C) = 11/12
p(A) + p(C) - p(A & C) = ⅔
p(C) + p(B) - p(C & B) = ¾

Independent and Disjoint:
p(A) + p(C) - p(A)*p(C) = ⅔
p(C) + p(B) - p(C)*p(B) = ¾
p(A) + p(B) + p(C) - p(C)*p(B) - p(A)*p(C)= 11/12

11/12 = p(A) + ¾ - p(A) * p(C)
p(A) – p(A) * p(C)= 1/6
p(C) + 1/6 = 2/3
p(C) = ½

4. Q4

F -> p(picking up fake coin)
p(!F) = 0.8
p(F) = 0.2
p(H|!F) = 0.5
p(H|F) = 1
p(H) = p(H|F)*p(F) + p(H|!F)*p(!F) = 1*0.2 + 0.5*0.8
p(H) = 0.6

p(F|H) = p(H|F) * p(F) / p(H) = 1 * 0.2 / 0.6 p(F|H) = **0.333 or 33.3%**