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1. **Coin problem**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Normal | Trick | Total |
| Bag1 | 30 | 10 | 40 |
| Bag2 | 20 | 20 | 40 |
| Total | 50 | 30 | 80 |

c = Bag1, o = Normal Coin

P(c|o) = P(o|c) \* P(c) / P(o) = 0.75 \* 0.5 / 0.625 = 0.6

1. **Medical Diagnosis**

P(X) = 0.02

P(Y) = 0.015

P(H) = 0.0965

P(A|X) = 0.8

P(A|Y) = 0.1

P(A|H) = 0

* 1. Calculate the probability of a person having Symptom A given that they have Disease X.

P(A|X) = 0.8

* 1. Calculate the probability of a person having Symptom A given that they have Disease Y.

P(A|Y) = 0.1

* 1. Given that a person presents with Symptom A, calculate the probability that they have Disease X.

P(A) = P(A|X)\*P(X) + P(A|Y)\*P(Y) = 0.8\*0.02 + 0.1\*0.015 = 0.0175

P(X|A) = P(A|X)\*P(X)/P(A) = 0.8 \* 0.02 / 0.0175 = 0.9143

* 1. Given that a person presents with Symptom A, calculate the probability that they have Disease Y.

P(Y|A) = P(A|Y)\*P(Y)/P(A) = 0.1 \* 0.015 / 0.0175 = 0.0857

1. **Professor Staab**

P(Attend) = 0.4

P(N\_Attend) = 0.6

P(Email) = 1/3

P(N\_Email) = 2/3

P(Not\_View) = P(Email,Attend) + P(N\_Email) = 0.8

P(V\_Email) = P(Email,N\_Attend) = 0.2

P(Attend|Not\_View) = P(Not\_View|Attend) \* P(Attend) / P(Not\_View) = 1\*0.4/0.8 = 0.5