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CSCI 3202

Problem Set 3

**Problem 3.1**

1. P(N, C, L) =0.7 \* 0.4 \* 0.2 = 0.056

P(~N, C, L) = 0.3 \* 0.4 \* 0.6 = 0.072

P(N, ~C, L) = 0.7 \* 0.6 \* 0.5 = 0.21

P(~N, ~C, L) = 0.3 \* 0.6 \* 0.8 = 0.144

P(L) = 0.056 + 0.072 + 0.21 + 0.144 = 0.482

P(B) = P(B|L)P(L) + P(B|~L)P(~L)

= 0.9(0.482) + 0.2(0.518)

= 0.5374

P(M) = P(M|L)P(L) + P(M|~L)P(~L)

= 0.6(0.482) + 0.3(0.518)

= 0.4446

P(S) = P(S|M)P(M) + P(S|~M)P(~M)

= 0.8(0.4446) + 0.1(0.5554)

= 0.41122

1. New P(L) = P(L|N, C)P(N) + P(L|~N, C)P(~N) = 0.2(0.7) + 0.6(0.3) = 0.32

P(B) = P(B|L)P(L) + P(B|~L)P(~L)

= 0.9(0.32) + 0.2(0.68)

= 0.424

P(M) = P(M|L)P(L) + P(M|~L)P(~L)

= 0.6(0.32) + 0.3(0.68)

= 0.396

1. P(C|S) = 0.15088
2. P(C, N|B) = 0.0952
3. P(M|B, ~N) = 0.4056

**Problem 3.2**