**Homework # 1** (Montgomery & Runger, 5ed)

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Problems:

Answers to odd-numbered problems can be found in Appendix B.

Answers to even-numbered problems are provided below.

**Chapter 2 Probability**

2-2  Axioms and Laws of Probability
Pages 35, Problems 2-61, 63, 66, 67

2-3  Addition Rule
Pages 40 - 41, Problems 2-74, 75, 77, 79

2-4  Conditional Probabilities
Pages 45 - 46, Problems 2-87, 93, 95, 97

2-5  Multiplication Rule
Pages 49 - 50, Problems 2-105, 106, 109, 111, 113 Correction 2-111 b) 0.078

2-6  Independence
Pages 54, Problems 2-122, 124, 126, 127, 129

Answers:

2-66  a) 0.86  b) 0.79  c) 0.14  d) 0.70  e) 0.95  f) 0.84
2-74  a) 0.7  b) 0.4  c) 0.1  d) 0.2  e) 0.6  f) 0.8
2-106  0.22

2-122  No
If A and B are independent, then P(A|B) = P(A).
Since P(A|B) = 0.4 and P(A) = 0.5, A and B are not independent.

2-124  No
If A and B are mutually exclusive, then P(A AND B) = 0.
If A and B are independent, then P(A AND B) = P(A) x P(B).
Since P(A) x P(B) = 0.2 x 0.2 = 0.04 ≠ 0, A and B are not independent.

2-126  No
If A and B are independent, then P(A AND B) = P(A) x P(B).
P(A AND B) = 70/100 = 0.70.
Since P(A) x P(B) = 86/100 x 79/100 = 0.68, A and B are not independent.

**Chapter 3 Discrete Random Variables and Probability Distributions** (Montgomery & Runger, 5ed)

3-4  Mean and Variance of Discrete Random Variable
Page 75, Example 3-10
Page 76, Example 3-11
Page 76, Problems 3-49, 51, 55

3-6  Binomial Distribution
Pages 84, Problems 3-77, 79, 85, 86, 87