**CS 364 Spring 2013**
**Homework #2 Solutions**
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Honor Code:

## Part 1

a) This is right.

$$P(A \text{ exec.} \mid B \text{ not exec.}) = \frac{P(A \text{ exec.})P(B \text{ not exec.} \mid A \text{ exec.})}{P(B \text{ not exec.})} \tag{1}$$

$$= \frac{\frac{1}{3} \cdot 1}{\frac{2}{3}} \tag{2}$$

$$= \frac{1}{2}$$

(1) This is just an application of Bayes' theorem. Now that we know $B$ will live, we can use this to figure out $A$'s probability of being executed.

(2) We know that only one person is being executed, so if $B$ is executed then the probability of $A$ living is 1.

b) This explanation supposes that the probability of $A$ being executed is independent of the probabilities of the other prisoners being executed. This is wrong. What if we had learned that $B$ *was* going to be executed? Then clearly $A$ would be stupid to think that they have a $\frac{1}{3}$ probability of being executed.

## Part 2

## Part 3

## Part 4

## Part 5

## Part 6