

## CS 228, Strong Induction Exercises

Name:

Some questions are from Discrete Mathematics and It's Applications 7e by Kenneth Rosen.

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### Chocolate

Assume that a chocolate bar consists of  $n$  squares arranged in a rectangular pattern. The entire bar, or any smaller piece, can be broken along a vertical or horizontal line separating the squares. Assuming that only one piece can be broken at a time, determine how many breaks you must make to break the bar into  $n$  separate pieces. Use strong induction to prove your answer.

**Express the theorem to be proved in terms of a propositional function  $P(n)$ .**

**Complete the Basis step.**

**What is the inductive hypothesis?**

**Complete the inductive step.**

## Two-Dollar Bills

Which amounts of money can be formed using just two-dollar bills and five-dollar bills? Prove your answer using strong induction.

**Express the theorem to be proved in terms of a propositional function  $P(n)$ .**

**Complete the Basis step.**

**What is the inductive hypothesis?**

**Complete the inductive step.**