*The first test for this course will be given in class on Monday, September 29. It covers Chapter 1, Sections 1 through 8 of the textbook. (Since some people in the class have not seen recursion in a programming class, you will not be tested on Section 9.)*

*The test will include some "short essay" questions that ask you to define something, or discuss something, or explain something, and so on. Other than that, you can expect most of the questions to be similar to problems that have been given on the homework. You can expect to do a few simple proofs, both formal proofs and more informal mathematical proofs. This might well include a proof by contradiction. You will* ***not*** *be asked to write a proof by induction, but you might have to answer questions about what it is or why it works.*

**Here are some terms and ideas that you should be familiar with for the test:**

translations from logic to English, and from English to logic
ambiguities in English
propositional logic
proposition
compound proposition
the logical constants $\mathbb{T}$ and $\mathbb{F}$
the logical and ($\wedge$), or ($\vee$), and not ($\neg$) operators
the or ($\vee$) operator is an "inclusive or"
truth table
logical equivalence ($\equiv$)
the conditional or "implies" operator ($\rightarrow$)
equivalence of $p \rightarrow q$ with $(\neg p) \vee q$
"the statement $p \rightarrow q$ makes no claim in the case when $p$ is false"
the negation of $p \rightarrow q$ is equivalent to $p \wedge \neg q$
the biconditional operator ($\leftrightarrow$)
tautology
Boolean algebra
laws of Boolean algebra (double negation, De Morgan's laws, distributive laws)
logic circuits and logic gates
AND, OR, and NOT gates
circuits that compute the value of compound propositions
converse of an implication
contrapositive of an implication
logical equivalence of an implication and its contrapositive
predicate logic

predicate
one-place predicate, two-place predicate, etc.
entity
domain of discourse
quantifiers, "for all" ($\forall$) and "there exists" ($\exists$)
using *variables* with predicates and quantifiers
negation of a statement that uses quantifiers
the difference between $\forall x\,\exists y$ and $\exists y\,\forall x$
arguments, valid arguments, and deduction
premises and conclusion of an argument
formal proof
how to show that an argument is invalid
logical implication ($\Longrightarrow$)
Modus Ponens, Modus Tollens, and Syllogism
fallacies
mathematical proof
hypotheses
doing a "$\forall x\big(P(x) \to Q(x)\big)$" proof
doing an "if and only if" proof
existence proof
counterexample
proof by contradiction
the integers, $\mathbb{Z}$
the natural numbers, $\mathbb{N}$ (the non-negative integers)
the rational numbers, $\mathbb{Q}$ (can be written as a quotient of integers)
the real numbers, $\mathbb{R}$ (all numbers on the number line; decimal numbers)
irrational number (real number that is not rational such as $\pi$ or $\sqrt{2}$)
divisibility (for integers $n$ and $m$, $m$ divides $n$ if $n = km$ for some integer $k$)
prime number (only positive integer divisors are itself and 1)
even and odd numbers
Principle of Mathematical Induction, First Form and Second Form
proof by induction
why induction works
induction and falling dominoes
base case
inductive case
induction hypothesis