The second test in this course will take place in class on Wednesday, October 29. It covers Chapter 2, Sections 1 through 6 and Chapter 3, Sections 1 and 2. The following list contains some of the terms and concepts that you should be familiar with.

Sets
Elements of a set, and the notation $x \in A$
Subset of a set, and the notation $A \subseteq B$
The empty set
A set can be a member of another set
Union, intersection, and set difference; $A \cup B$, $A \cap B$, and $A \setminus B$
Definitions of set operations in terms of logic
Universal set and the complement of a set, $\overline{X}$
Power set of a set
Boolean algebra for sets
Commutative, associative, and idempotent laws for sets
DeMorgan's law for sets
Using a 32-bit *int* to represent a subset of $\{0, 1, 2, \ldots, 31\}$
The bitwise logical operators `&`, `|`, and `~` in C++ and Java
Hexadecimal numbers
Ordered pairs, (a, b)
Cartesian product of sets, $A \times B$
Functions
The notation $f\colon A \to B$
One-to-one and onto functions
Bijections (one-to-one correspondences)
Counting
Finite, infinite, countably infinite, countable, and uncountable sets
Cardinality of a finite set, $|A|$
Cardinality facts: $|A \times B| = |A| \cdot |B|$, $|A \cup B| = |A| + |B| - |A \cap B|$, $|\mathcal{P}(A)| = 2^{|A|}$
Diagonalization argument
Proof that $\mathbb{R}$ is uncountable
Proof that $\mathcal{P}(\mathbb{N})$ is uncountable
Alphabets, strings, Σ^*, and languages
The empty string, ε
Operations on strings: length ($|w|$), concatenation (xy), reverse (x^R)
The number of different languages over an alphabet Σ is uncountable
Operations on languages: $L \cap M$, $L \cup M$, $\overline{L}$, L^R, L^n, L^*
Regular expressions and regular languages
The language $L(r)$ generated by a regular expression r
Finding regular expressions for languages and vice-versa