Review for Test 3

November 21, 2007

• **Pigeonhole principle.** Theorem, proof of it, and applications.

• **Counting.**
  – Counting strings and passwords.
  – Combinations and permutations. Finding committees, passwords, etc.
  – The binomial theorem and applications.

• **Recurrence relations.**
  – Modeling with recurrence relations. Finding a recurrence relation for the number of strings (binary, ternary, and so on) with (without) two (three, and so on) consecutive zeros (a’s, 2’s). The number of strings that contain substring 01.
  – Solving linear recurrence relation with constant coefficients (homogenous and non-homogenous).

• **Divide and conquer recurrence relation.** Main theorem and a proof of it.