CPS 130 Homework Solutions

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HOMEWORK 6

6.1: Prove by contradiction that there must be a slot with at least $n$ keys hashed to it (Pigeon-Hole Principle).

6.2: We can search the key by comparing its hash value with those of the keys in the list, and further comparing keys if their hash values are matched. Thus, lots of long character string comparisons are saved on average.

6.3: Choose a good enough hash function (you can use universal hashing at least), and construct a hash table with $n$ slots to store the numbers with their occurrences. This can be done in expected $O(n)$ time.

6.4: Modify RANK to run in constant time.

6.5: By Theorem 7 (optimality), you can prove by contradiction that there cannot be any other stable marriages.