Quiz: Friday, April 1st (in class)

Remarks

The quiz that was scheduled for Friday, March 25th will now take place on **Monday, March 28th**.

Reading

For Monday, March 28th, Section 12.2.
For Wednesday, March 30th, Section 12.3.
For Friday, April 1st, Section 12.4.

Assignment questions

Section 11.5: 10, 12, 18.
Section 11.6: 4, 6 a), 7, 8.
Section 12.1: 8, 12.

Instructor questions:

1. Let G be a graph such that $\max_{v \in V(G)} deg(v) = k$. By induction on the number of vertices of G, show that G has a proper coloring that uses at most $k+1$ colors.
2. Prove that if a graph has at most m vertices of degree at most n and all other vertices have degree at most k, with $k < n$ and $m < n$, then the graph is colorable with $m + k + 1$ colors.
3. In the field of DNA sequencing, a major problem is the following: you are given a set of k DNA strings, $S_1, \ldots, S_k$, (strings on the alphabet $\{A, C, G, T\}$) that are all substrings of a larger string S. Let G be the graph defined as follows: $V(G) = \{S_1, \ldots, S_k\}$ and $E(G)$ is such that $\{i, j\} \in E(G)$ if and only if a prefix of S_j is a suffix of S_i (i.e. the beginning of S_j is equal to the end of S_i) or reciprocally.

   If $k = 8$ and $S_1 \ldots S_8 = \{ATG, AGG, TGC, TCC, GTC, GGT, GCA, CAG\}$, find a string S such that every letter of S belongs to at least one of these strings ?

Some other questions worth trying

Section 11.5: 7.
Section 11.6: 1, 3.
Section 12.1: 1, 3.