

Quiz: Friday, January 28th (in class)

## Reading

For Monday, Section 8.1.

For Wednesday, Section 8.2.

For Friday, Section 9.1.

## Assignment questions

Section 3.7: 6, 8.

Section 8.1: 7, 8, 14, 18, 30.

Section 8.2: 2, 4.

**Instructor question:** Let  $S$  be a set with  $N$  elements and  $A_1, \dots, A_{101}$  be 101 (possibly non disjoint) subsets of  $S$  with the following properties:

1. each element of  $S$  belongs to at least one subset  $A_i \in \{A_1, \dots, A_{101}\}$ ,
2. each subset  $A_i \in \{A_1, \dots, A_{101}\}$  contains exactly 1000 elements of  $S$ ,
3. the intersection of any pair  $\{A_i, A_j\}$  of distinct subsets of  $\{A_1, \dots, A_{101}\}$  contains exactly 20 elements,
4. the intersection of any three distinct subsets  $\{A_i, A_j, A_k\}$  of  $\{A_1, \dots, A_{101}\}$  contains exactly 6 elements,
5. the intersection of any four or more distinct subsets of  $\{A_1, \dots, A_{101}\}$  is empty.

Using the Inclusion/Exclusion Principle, compute  $N$  the cardinality of  $S$ .

## Some other questions worth trying

Section 8.1: 1, 3, 9, 13, 17

Section 8.2: 1, 3, 5, 8