CS 235 Spring 2010

Assignment 4

Date Due: Thursday, March 4 at 5:00

Reading: Chapters 8, pages 153-162, and Chapter 9, pages 171-199 In the second edition (soft cover) this is pages 214-223 and pages 134-154.

Problems:

Note: The problem numbers starting with E refer to the second edition.

1. Page 130, problem 4

Page 122, E9, part (ii)

- 2. Let R be a commutative ring with identity. Prove the following.
 - (i) $a \cdot 0 = 0$ for all a in R.
 - (ii) (-a)(-b) = ab for all a, b in R.
 - (iii (na)b = a(nb) = n(ab) for all n in N, and a, b in R.

Here $na = a+a+\dots+a$, n times.

3. Page 130, problem 11

(If you want to use problem 8 here, then first prove it.) Page 123, problem E17.

4. Page 130, problem 12, part (i) only

Page 123, problem E13 part (i)

5. Page 131, problem 16

6. Find all the units of Z_{21} and verify that the set of all units is closed under multiplication.

Page 122, problem E7

7. Page 138, problem 22.

Page 121, problem E2

- 8. Page 138, problem 23
- 9. Page 139, problem 27

Page 125, problem E2

10. In Z_{16} find all the zero divisors, and for each zero divisor find all its complementary zero divisors.