

2.1 means Exercise 1 from Chapter 2. **This is a moderately substantial assignment.**

Key:

(No symbol) Not required to be turned in. Just be sure that you can do it.

(t -7) To be turned in and graded, worth 7 points.

1. 8.1abdehijnptu (additional practice problems)
2. (t-3) 8.1e
3. (t-3) 8.1f

**Previous questions and answers from Piazza:**

**Q** The last part of the definition of this language is  $|x|,|y| \equiv_5 0$ . Does this simply mean, the length of x times the length of y is a multiple of 5? Or does the dot notation imply something else? **A** It means what you think it means.

4. (t-3) 8.1g
5. (t-3) 8.1h
6. (t-3) 8.1k
7. (t-3) 8.1m
8. (t-9) 8.7a. Do this problem by construction; produce an algorithm that takes as input a DFSM  $M = (K, \Sigma, \delta, s, A)$  that accepts language  $L$ . The algorithm returns the description of a DFSM  $M' = (K', \Sigma, \delta', s', A')$  that accepts  $pref(L)$ . You do not have to write a formal proof that the new machine actually accepts  $pref(L)$ . **Hint:**  $M'$  will have a lot of its elements in common with  $M$ , but it takes a somewhat complex calculation (based on  $M$ ) to determine exactly what has to be changed.
9. 8.2ac
10. 8.3
11. (t-6) 8.4a
12. 8.4b
13. 8.7

The last two problems used to be part of HW7.

14. (t-9) 6.18 Regular expression based on a relation and its closure. Transitive and reflexive closures are introduced in Section A.5 Closures under various operations are also mentioned on pages 17, 57, 72 (12, 42, 53 in the online PDF file).
15. 6.20 True-False problems. Good practice for exams. Similar exam problems will usually not require proofs.