

9. Homework

Due **12/4/09** before class

Please refer to the corresponding exercise sections in the textbook (Rosen, 6th edition).

9.1 (page 595)

(a) (1.5 points) 10 4,5,8

9.3 (page 618)

(a) (3.5 points) For the graph given in exercise number 2:

- i. Specify the set of vertices V .
- ii. Specify the set of edges E .
- iii. Give the degree for each vertex.
- iv. Verify that the handshaking lemma holds.
- v. Draw the directed graph that can be used to represent this undirected graph.
- vi. Give the adjacency matrix representation for this graph. (Assume vertices are sorted lexicographically.)
- vii. Give the adjacency lists representation for this graph.

(b) (3.5 points) For the graph given in exercise number 4:

- i. Specify the set of vertices V .
- ii. Specify the set of edges E .
- iii. Give the in-degree and the out-degree for each vertex.
- iv. Verify that the handshaking lemma holds.
- v. Give the adjacency matrix representation for this graph. (Assume vertices are sorted lexicographically.)
- vi. Give the adjacency lists representation for this graph.

(c) (1 point) 12

9.4 (page 629)

(a) (1 point) 6 3,5

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10.1 (page 693)

- (a) (1 point) 2 d, e. Justify your answers.
- (b) (4.5 points) 4 a-h, and i below:
 - i) List the vertices at level 2.
- (c) (4 points) Use (strong) induction on l to show that for all $l \geq 1$, a full binary tree with l leaves has $2l - 1$ vertices total.