

CMPUT 204 — Problem Set 4

Topics covered in Part I are dynamic programming and its applications matrix-chain multiplication and longest common subsequence; in Part II are disjoint-set and its operations, graphs, BFS and DFS.

It is highly recommended that you read pages **323–324**, **331–356**, **498–509**, and **527–549** very carefully and do **all** the exercises. The following are some of them that you are **REQUIRED** to practice on.

Quiz questions are mostly based on this list, with some minor modifications necessary. Consult your instructor and TAs if you have any problem with this list.

Part I

1. P338, Ex 15.2-1.

Show both the m and s entries.

2. P338, Ex 15.2-4.
3. P338, Ex 15.2-5.
4. P349, Ex 15.3-1.
5. P349, Ex 15.3-3.
6. P356, Ex 15.4-1.
7. P356, Ex 15.4-5.

Part II

1. P501, Ex 21.1-1.
2. P501, Ex 21.1-3.
3. P509, Ex 21.3-1.

Repeat this question without path compression.

4. P518, Ex 21.4-2.

Hint: show that rank is at most height, and that height is at most $\lg n$; see course lecture slides.

5. P530, Ex 22.1-1.
6. P530, Ex 22.1-2.
7. P530, Ex 22.1-3.
8. P530, Ex 22.1-5.
9. P530, Ex 22.1-6.
10. P539, Ex 22.2-1.
11. P539, Ex 22.2-2.
12. P539, Ex 22.2-3.
13. P539, Ex 22.2-6.
14. P547, Ex 22.3-2.
15. P549, Ex 22.3-10.
16. P549, Ex 22.3-11.