

# CS5800: Algorithms — Virgil Pavlu

## Homework 4

Name:

Collaborators:

Instructions:

- Make sure to put your name on the first page. If you are using the  $\text{\LaTeX}$  template we provided, then you can make sure it appears by filling in the `yourname` command.
- Please review the grading policy outlined in the course information page.
- You must also write down with whom you worked on the assignment. If this changes from problem to problem, then you should write down this information separately with each problem.
- Problem numbers (like Exercise 3.1-1) are corresponding to CLRS 4<sup>th</sup> edition. While the 3<sup>rd</sup> edition has similar problems with similar numbers, the actual exercises and their solutions are different, so make sure you are using the 4<sup>th</sup> edition.

1. **(15 points)** Exercise 15.2-3. Use induction to argue correctness.

**Solution:**

2. **(15 points)** Exercise 15.2-4.

**Solution:**

3. **(15 points)** Exercise 15.2-5.

**Solution:**

4. **(15 points)** Exercise 15.2-6.

**Solution:**

5. **(Extra Credit 15 points)** Exercise 15.3-3. First prove by induction that  $\sum_{i=0}^{n-1} F(i) = F(n+1) - 1$

6. **(20 points)** Problem 15-1, (a), (b) and (c).

**Solution:**

7. **(15 points)** Exercise 14.4-5. Hint: try to solve this problem using a greedy approach – it may not work; if it doesn't work, it means you must use DP and you can leave it for HW5.

**Solution:**