

CS 5720 Design and Analysis of Algorithms  
Homework #2

**Submission requirements:**

- Submit your work in PDF format to the appropriate assignment on Canvas.
- **5% extra credit** if your writeup is *typed*.

**Assignment:**

1. Complete Problem 1 from Exercises 2.4 in the textbook.
2. Solve the following recurrence relations using any method (Repeated substitution, Characteristic functions, Generating functions, or any other method you like). Assume that  $T(0) = c$  and  $T(1) = c$  for some  $c > 0$ .
  - (a)  $T(n) = 2T\left(\frac{n}{2}\right) + n^3$
  - (b)  $T(n) = T(\sqrt{n})\sqrt{n} + n$ . here, assume that  $T(2) = c$ .
  - (c)  $T(n) = 2T\left(\frac{n}{2}\right) + \frac{n}{\log n}$
  - (d)  $T(n) = 3T\left(\frac{n}{2}\right) + n \log n$