

Homework 1
Algorithms Analysis and Design (501435-3)
Spring 2022

Due: Monday February 28, 2022, 11:59 pm via Blackboard (Firm deadlines)

- Show that $6n^2+8n+2$ is $O(n^2)$
- Show that $20n+6$ is $O(n)$
- Find the closed form for the following series:
 - a) $1 + 2 + 3 + 5 + \dots + n$
 - b) $1 + x^2 + x^3 + \dots + x^n$ where x is constant and $x > 1$
 - c) $1 + x^2 + x^3 + \dots + x^n$ where x is constant and $x < 1$
 - d) $1 + (1/2) + (1/3) + \dots + (1/n)$
- Use the iteration method to solve the recurrence
$$T(n) = 4T(n/2) + n^2$$
- Exercise 4.3-1
- Exercise 4.3-2
- Exercise 4.3-3
- Exercise 4.3-9
- Exercise 4.4-1
- Exercise 4.4-2
- Exercise 4.4-4
- Exercise 4.4-6
- Exercise 4.5-1
- Exercise 4.5-3
- Exercise 4.5-4
- Problems 4-1
- Problems 4-3