

First Semester 2023-24
Data Structures and Algorithms Design (Merged-SEZG519/SSZG519)
Exercises (Analyzing Algorithms)

1. Use Master's theorem to solve the following division functions.

a. $T(n) = 3T(n/2) + n^2$

b. $T(n) = 4T(n/2) + n^2$

c. $T(n) = 16T(n/4) + n$

d. $T(n) = 2T(n/2) + n \log n$

e. $T(n) = 2T(n/4) + n^{(0.51)}$

f. $T(n) = \sqrt{2}T(n/2) + \log n$

g. $T(n) = 6T(n/3) + n^2 \log n$

2. Use Master's theorem to solve the following decreasing functions.

a. $T(n) = 0.5T(n-1) + n$

b. $T(n) = 2/3T(n-1) + n^2$

c. $T(n) = T(n-1) + n^2$

d. $T(n) = 2T(n-1) + n^2$

e. $T(n) = 3T(n-2) + n$