Graded Assignment 2

Solution - Jai Jain

Part1

Q) Find the time complexity of the below functions in Θ form. Write NA if the function does not apply to any case.

a) $T(n) = 3T(n/2) + n$
b) $T(n) = 64T(n/8) - n^2(\log n)$
c) $T(n) = 2nT(n/2) + n^n$
d) $T(n) = 3T(n/3) + n/2$
e) $T(n) = 7T(n/3) + n^2$

Solution:

a) $T(n) = 3T(n/2) + n$
➔ $T(n) = \Theta(n^{\log_2 3})$

b) $T(n) = 64T(n/8) - n^2(\log n)$
➔ $T(n) = \Theta(n^2 \log^2 n)$

c) $T(n) = 2nT(n/2) + n^n$
➔ Not possible to compute time complexity

d) $T(n) = 3T(n/3) + n/2$
➔ $T(n) = \Theta(n \log n)$

e) $T(n) = 7T(n/3) + n^2$
➔ $T(n) = \Theta(n^2)$