

Assignment 2

1. Solve the following Recurrence relations using substitution method.

a. $T(n) = 4T(n/2) + n^2$, if $n > 1$
 $= 1$ if $n = 1$

b. $T(n) = 2T(n/2) + c$, if $n > 1$
 $= c$ if $n = 1$

c. $T(n) = T(n-1) + 1$, if $n > 1$
 $= 1$ if $n = 1$

d. $T(n) = T(n-1) + n$, if $n > 1$
 $= 1$ if $n = 1$

e. $T(n) = 2T(n/2) + n$, if $n > 1$
 $= 1$ if $n = 1$

f. $T(n) = 2T(n/2) + n \log_2 n$ if $n > 1$
 $= 1$ if $n = 1$

g. $T(n) = T(n-2) + n^2$, if $n > 2$
 $= 1$ if $n = 1$ or $n = 2$

h. $T(n) = 4T(n/2) + n \log(n!)$

i. $T(n) = 3T(\sqrt{n}) + \log_2 n$

j. $T(n) = T(n/2) + n^2$

2. Solve the following Recurrence relations using Recurrence Tree method.

a. $T(n) = 3T(n/4) + \Theta(n^2)$

b. $T(n) = T(n/3) + 2T(n/3) + cn$

c. $T(n) = 3T(n/2) + n$

d. $T(n) = T(n/2) + n^2$

e. $T(n) = 4T(n/2+2) + n$

f. $T(n) = 2T(n-1) + 1$

g. $T(n) = T(n-1) + T(n/2) + n$

h. $T(n) = T(n/3) + T(2n/3) + cn$

i. $T(n) = 4T(n/2) + cn$

j. $T(n) = T(n-a) + T(a) + cn$

3. Solve the following Recurrence relations using Master method.

a. $T(n) = 9T(n/3) + n$

b. $T(n) = 2T(n/4) + 1$

c. $T(n) = 2T(n/4) +$

d. $T(n) = 2T(n/4) + n$

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

f. $T(n) = 7T(n/2) + n^2$

g. $T(n) = T(n/2) + 1$

h. $T(n) = 4T(n/2) + n^2 \log_2 n$