CS/DSA 4413 Algorithm Analysis
Homework-4, Due on Feb 14, 2019

1) Solve the following recurrences: (30- points)

    a) $T(n) = 3\,T(n/2) + 5n$, $n = 2^k$, $T(1) = 1$

    b) $T(n) = 4\,T(n/2) + n$, $n = 2^k$, $T(1) = 1$

    c) $T(n) = T(\sqrt{n}) + 1$, $n = 2^{2^k}$, $T(2) = 1$

Note: Use substitution method and show all steps

2) a) If $10 = 2^X$, find X. Compute the value of $Y= 2^{2^{2^{2^2}}}$ (15- points)

   b) Define $log_2^{(k)}\, n = log\,(log\,(log......(log\,n)\,...))$ (repeated k times) The least value of k such that $log_2^{(k)} n$ is called log^*n. Find value of log^*Y where Y is defined in 2 a).

   c) Find $log_2^*\, n$ where $n = 10^{12}$.