Tutorial – Recursion & Algorithms

1. What is Recursion? Why is it a useful mechanism to use in computing?

2. Evaluate $t(2)$, $t(3)$, and $t(4)$ for the following recursively defined sequences:

(a) $t(1) = 3$
$t(n) = t(n-1) + 4 \quad (n>1)$

(b) $t(1) = 0$
$t(n) = 2t(n-1) + 1 \qquad (n>1)$

3. Find a recursive and a non-recursive definition for the following sequences:

(a) 2, 4, 6, 8, 10, 12, …

(b) 2, 5, 8, 11, 14, 17, …

4. For the sequence in question 6(a) and (b), write an iterative algorithm to output the first m terms of the sequence.