CS21201 Discrete Structures
Tutorial Problems

Recurrence

1. Solve the recurrence relation: $a_n = na_{n-1} + n(n-1)a_{n-2} + n!$ $for\ n >= 2$, with $a_0 = 0,\ a_1 = 1$

2. Find and solve a recurrence relation for the number of ways to park motorcycles and compact cars in a row of n spaces if each cycle requires one space and each compact needs two. (All cycles are identical in appearance, as are the cars, and we want to use up all the n spaces)

3. An alphabet Σ consists of four numeric characters 1, 2, 3, 4, and seven alphabetic characters a, b, c, d, e, f, g. Find and solve a recurrence relation for the number of words of length n (in Σ^*), where there are no consecutive (identical or distinct) alphabetic characters.