1. Consider all positive integers with seven **different** digits. (Note that zero cannot be the first digit, and by different, we mean that there is no repeated digit in the number.)
   1. Find the number of them if there is no other restriction.
   2. Find the number of them which are greater than 8000000.
   3. Find the number of them which are odd.
   4. Find the number of them which are divisible by 5.
2. A class contains eight boys and eight girls. In how many ways can they stand in a line if they must alternate in gender (no two boys and no two girls are standing next to one another)?
3. When 80! Is written out in full it equals

90! = 1457159 . . . 00000.

Without using a computer, determine the number of 0 digits at the end of this number.