

problem #2

How many words of length 8 contain three A's.
For instance, some good words are

A A A B X Y X Z
A Y Y Y A Z X A
B C D E F A A A
etc

solution 2

Step 1 Pick 3 positions in the word for the A's. Can be done in $\binom{8}{3}$ ways.

Step 2 Fill the other 5 places with non-A's. Can be done in $25 \cdot 25 \cdot 25 \cdot 25 \cdot 25$ ways.

Answer is $\binom{8}{3} \cdot 25^5$