Assignment 1 Proof

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Consider an array of N-elements. Any array of n-elements can be composed in $N!$ different ways, consider the following three element array.

$$[A, B, C][A, C, B][B, A, C][B, C, A][C, A, B][C, B, A] \tag{1}$$

Our good shuffle method matches this concept. We end up with the 6 combinations with equal distribution. If we use the bad shuffle method on our 3-element array from above, we end up with n^n different paths and they create an unequal distribution which is shown below.

$$[A, B, C] = 4[A, C, B] = 5[B, A, C] = 5[B, C, A] = 5[C, A, B] = 4[C, B, A] = 4 \tag{2}$$

This should suffice as a counter example, since the distribution is not equal this is not random. I have all of the work if you want to look at it.