Homework 8: Error-Correcting Codes and Latin Squares

Try one of the following three problems (or come up with something of your own!)

1. Take a deck of playing cards, and remove the 16 aces, kings, queens, and jacks from the deck. Can you arrange these cards into a 4×4 array, so that in each column and row, no two cards share the same suit or same face value?

2. Suppose you have a strange deck of playing cards with six possible suits and six possible face cards, yielding 36 total cards (one for each pair.) Can you arrange these cards into a 6×6 array so that in each column and row, no two cards share the same suit or same face value?

3. Prove the last claim from the notes:

   Proposition 1. *There is a q-ary code of length 4, distance 3, and containing q^2 many elements, whenever there are a pair of mutually orthogonal Latin squares of order q.*