Math Mania: The Mathemagician & error detection

Supplies: at least 36 paper cups
(or cards with one colour on one side and a different colour on the other,
or a deck of ordinary playing cards)

Step 1: Set out the cups in a 5x5 square, with some Up and some Down.
You could ask someone in your audience to do this.

Step 2: Saying, "just to make it a little harder," set out one more row and one more column.
The key is to ensure that there are an even number of Ups and Downs in each row
and each column.
Keep talking as you do this so that your audience doesn't catch what you are doing!

Step 3: Ask one person to turn over <u>one</u> cup, while you turn around and cover your eyes.

Step 4: Turn back and find the row and the column with an odd number of Ups.
Again, keep talking while you do this to distract the audience – try to make it
dramatic!

Step 5: Do it a few times to see if anyone can figure out what is going on.
Don't reveal the answer too quickly.
You could let audience members who think they have figured it out try it themselves
before you reveal the answer (or ask them to reveal it).

Step 6: Explain that this activity illustrates how computers detect errors when data is
transmitted from one computer to another, or a thumb drive to a computer, etc.

Variations:
Obviously there's nothing special about 6x6. You could have a rectangle of any dimensions, as
long as they are even numbers. You could also start with odd parity.

If you have two mathemagicians available, you could run two of these at once and see who is
faster.   You could also combine the two smaller squares into a large rectangle.

Depending on the age of your audience, here's a joke they might enjoy at the end:
Q: *What do you call this: "Pieces of nine, pieces of nine"?*
A: *A parroty error.*