ICAC Activity Summary – Error Detection & Correction

This CS Unplugged activity can serve as great way to teach pattern recognition through computer science.   In this activity, students will use a magic trick to learn how computers detect and correct errors in files.

Content Standards:

MA(4) – Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. [4-OA4]

Materials:

- A set of 36 of identical, double-sided colored cards for each student in the class and one for the teacher.
- Magic cape (optional)

Resources:

- http://csunplugged.org/error-detection

Activity Summary:

- Tell the class that you have magic super powers, and you would like to show your magic super powers to them.
- Take a student volunteer and have him/her place a 5x5 grid of double sided color cards in random order on a table where the rest of the class can see. Tell the students that if one of them flips over one of the cards while you are not looking, that you will be able to determine which one was flipped using your magic super powers.
- Tell the class that you would like to make the grid a bit harder (since you have magic super powers) and add an extra row and column making a 6x6 grid. The trick is making sure that by adding the extra row and column, you create an even number of one color in each row and column. Zero counts as an even number.
- Perform the trick by turning your back, and asking one student flip a card over. When you turn around, the flipped card should be easy to find because it will be at the intersection of the row and column with an odd number of the colored card. Hold for applause; your students will be shocked and amazed.
- Repeat the trick several times, and see if your students can catch the trick. Tell the students that the key to the trick is in the pattern. As more students begin to see the pattern, lead them all to the solution of the magic trick.

- Have the students take turn showing off their own magic super powers by trying and practicing the trick themselves in small groups. Walk around the room to ensure that the students understand the pattern behind the trick.

- Relate the activity to the real-world by explaining that computers perform similar tricks to catch errors in files that are stored or transmitted. If something in a file is changed, then a computer will know because it added something that would make detecting changes easy.