# Game-based Learning
For Teaching Error Detection/Correction in COSC244 (Networks)

Activity 1: Lecturer asks a student to lay out a square grid of two-sided cards, and the lecture then says they are going to make it a bit harder, and add an extra row and column to the square. The lecturer then faces the other way while the student flips over one card. The lecturer turns back around again, and tells the students which card was flipped! The question now is, how did the lecturer know which card had been flipped without seeing the card being flipped, or memorising the layout? The short answer is error control coding. Let's look more closely at that the idea of parity check….

For in-person teaching   For online teaching

Computer Science Buskers? (Error Detection)
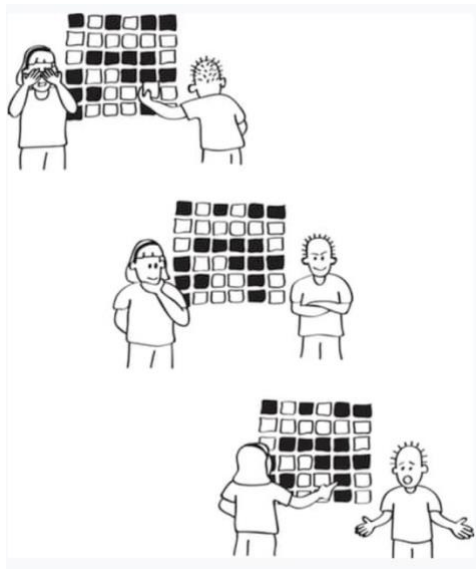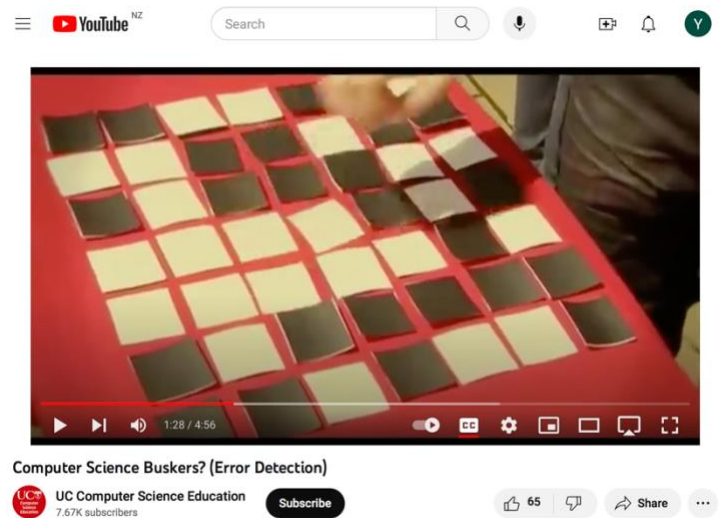
Activity 2: Lecturer asks a student to randomly choose a number from 1 to 60 and asks the student not to speak out. Then, the lecturer asks the student which cards below have the number. The lecturer is able to immediately guess the number by adding up the first number of those cards selected. Students feel surprised! What is the secret behind the trick? The short answer is hamming coding. Let's look more closely at that the idea of hamming code….

10001001 Binary Card Game 10010001

Binary Numbers --- Introduction --- Addition --- Multiplication --- Counter --- Card game - 1 - 2 - 3

Choose a number from 1 to 60. You will find it on one or more of the cards below. Click on all the cards with your number on. (Don't click on the number because that would make it too easy for the computer!) If you make a mistake, click on the card again. Make sure you have clicked on **every** card with your number on or it won't work. Then click on the button to reveal your number. How does the computer do it?

16 21 26 31 52 57	1 11 21 31 41 51	4 13 22 31 44 53	8 13 26 31 44 57	2 11 22 31 42 51
17 22 27 48 53 58	3 13 23 33 43 53	5 14 23 36 45 54	9 14 27 40 45 58	3 14 23 34 43 54
18 23 28 49 54 59	5 15 25 35 45 55	6 15 28 37 46 55	10 15 28 41 46 59	6 15 26 35 46 55
19 24 29 50 55 60	7 17 27 37 47 57	7 20 29 38 47 60	11 24 29 42 47 60	7 18 27 38 47 58
20 25 30 51 56	9 19 29 39 49 59	12 21 30 39 52	12 25 30 43 56	10 19 30 39 50 59

32 37 42 47 52 57
33 38 43 48 53 58
34 39 44 49 54 59
35 40 45 50 55 60
36 41 46 51 56