

GEMS OF TCS

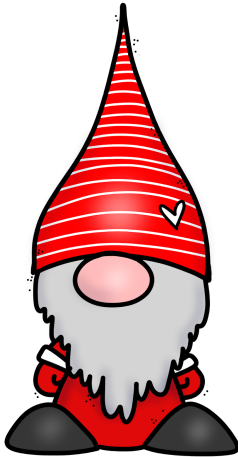
ERROR CORRECTING CODES

Sasha Golovnev

October 18, 2023

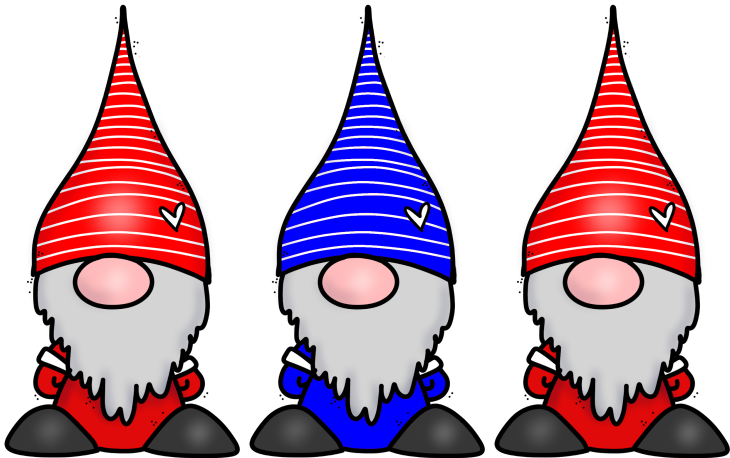
ERROR CORRECTING CODES

Area of CS that saves little gnomes' lives



Hat Game

HAT GAME



Why Mathematicians Now Care About Their Hat Color



By Sara Robinson

April 10, 2001

It takes a particularly clever puzzle to stump a mind accustomed to performing mental gymnastics.

So it's no ordinary puzzle that's spreading through networks of

HAT GAME

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- Red and Blue hats are placed randomly (and independently) on gnomes' heads
- Each gnome sees all hats except for their own one
- No communication!
- Strategy session before the start
- Simultaneously guess color of their own hat or pass

WINNING CONDITIONS

- **Win:** no player guessed incorrectly **AND** at least one guessed correctly

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- **Win:** no player guessed incorrectly **AND** at least one guessed correctly
- **Lose:** at least one guessed incorrectly **OR** all passed

SOLUTION FOR 7 GNOMES

0000000	0001111	0010110	0011001
0100101	0101010	0110011	0111100
1000011	1001100	1010101	1011010
1100110	1101001	1110000	1111111

Hamming Code

Ulam's Problem