DIGITAL SCHOOLHOUSE together with NINTENDO SWITCH

Digital Schoolhouse Puzzle Page

"If I had an hour to solve a problem I'd spend 55 minutes thinking about the problem and 5 minutes thinking about solutions"

Albert Einstein

Welcome to the Digital Schoolhouse Puzzle Page

On this paper, we will investigate a series of puzzles that can be used to promote Computational Thinking. This month we will investigate Santa's Glove Selection conundrum.

Santa's Glove Selection

Santa has 20 gloves in a drawer: 5 pairs of black gloves, 3 pairs of brown, and 2 pairs of grey. Santa selects the gloves in the dark and can check them only after a selection has been made.

What is the smallest number of gloves that Santa needs to select to guarantee getting the following?

(a) At least one matching pair?

(b) At least one matching pair of each colour?

Answer:

(a) 11 gloves.

In the worst case, before Santa selects at least one matching pair, Santa will select 5 black gloves, 3 brown gloves and 2 grey gloves - all for the same hand. The next glove will have to yield a matching pair.

(a) 19 gloves

In the worst case, before Santa selects one matching pair of each colour, Santa will select all 10 black gloves, all 6 brown gloves and 2 grey gloves for the same hand. The next grey glove will have to yield Santa a matching pair.

Linkage to Computer Science

This puzzle provides a simple example of the worst-case analysis of an algorithm efficiency.

Puzzle 19: Easy

		6	9			8	3	
	4			3		2		7
			8			9		
				4		5		6
7			2		6			3
4		8		5				
		2			1			
9		4		6			5	
	8	5			3	1		

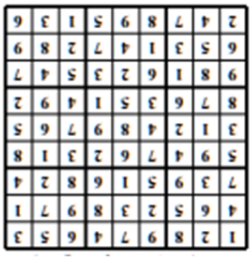
Puzzle 20: Medium

8					7	6		2
			2		3	1	7	
			5		1		8	
					5	8		9
	9						5	
3		8	1					
	2		7		9			
	6	9	8		4			
7		3	6					1

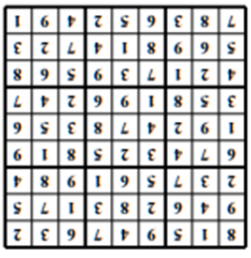
Puzzle 21: Hard

1	2				4			
4		5		3	8			
	3			1		8	2	
			7				1	
3			4		9			5
	7				1			
	8	1		2			4	
			1	4		2		9
			8				3	6

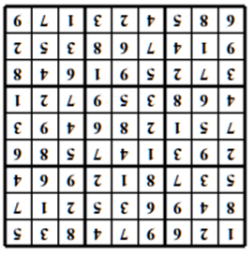
Solutions



Puzzle 21: (Hard, difficulty rating 0.64)



Puzzle 20 (Medium, difficulty rating 0.50)



Puzzle 19: (Easy, difficulty rating 036)