

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 the classic Sudoku puzzle.

Glove Selection

There are 20 glove in a drawer: 5 pairs of black glove, 3 pairs of brown, and 2 pairs of grey. You select the gloves in the dark and can check them only after the selection has been made. What is the smallest number of gloves you need to select to guarantee getting the following?

- (a) At least one matching pair
- (b) At least one matching pair of each colour

Answers

(a) 11

In the worst case, before you get at least one pair of a matching pair, you 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. Thus, the answer is 11 gloves.

(b) 19

In the worst case, before you get one pair of a matching pair of each colour, you will select all 10 black gloves, all 6 brown gloves and 2 grey gloves for the same hand! The next glove will have to yield a matching pair. Thus, the answer is 19 gloves.

Linkage to Computer Science

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

Solutions

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

Puzzle 9: (Hard, difficulty rating 0.71)

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

Puzzle 8 (Medium, difficulty rating 0.59)

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

Puzzle 7: (Easy, difficulty rating 0.27)

Puzzle 7: Easy

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

Puzzle 8: Medium

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

Puzzle 9: Hard

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