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 Knights and Knaves...

Knights and Knaves I

An island has two kinds of inhabitants, ***knights,*** who always tell the truth, and ***knaves,*** who always lie.

You go to the island and meet A and B.

A says "B is the knight"

B says "The two of use are of oppose types."

What types of inhabitants are A and B ?

Answer: Both are Knaves

Let ***p*** and ***q*** be the proposition statements that A is a knight and B is a knight, respectively. So, then ***¬p*** represents the proposition that A is a knave and ***¬q*** that B is a knave.

If A is a knight then ***p*** is true. Since knights always tell the truth, ***q*** must also be true.. Then the compound proposition statement (p □ ¬q) V (¬ p □ q) would have to be true, but it is not. Thus, if A is a knight then B's statement must also be true, but it is not. So, A is not a knight and therefore must ***¬p*** be true.

If A is a knave, then B must not be a knight since knaves always lie. So, then both ***¬p*** and ***¬q*** hold since both are knaves.

Linkage to Computer Science

This puzzle is an example of propositional logic which underpins systems specification, and the design of logic circuits.

Solutions

Puzzle 40 (Easy, difficulty rating 0.39)

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

Puzzle 41: (Medium, difficulty rating 0.54)

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

Puzzle 42: (Hard, difficulty rating 072)

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

Puzzle 40: Easy

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

Puzzle 41: Medium

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

Puzzle 42: Hard

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