Computational Thinking for Students: Previous Days Answer Sheet: Day Five

Question One

Answer: One window, [2, 4] ([2,5] was replaced last year).

Explanation: When programming, it is best to lay out data in a table constructed from rows and columns: it is called an array. Every array element (table square) is indicated by a row and a column number. It is possible to look at the beaver's house as an array and its elements (windows), which are identified by row and column numbers.

Question Two

Answer: 3 swaps are needed.

Explanation: Typically, automatic processing of data is much easier, when data is arranged according to some criteria – then it is sorted. The method for sorting the set of cards that is described in this task is called "bubble sort". This sorting algorithm steps through a list of objects again and again, swapping any neighbouring objects which are in the wrong order. The list is sorted when no swap occurs during a pass through the list. Bubble sort is quite easy to understand compared to other sorting algorithms. But unfortunately, it is not very efficient.

Question Three

You must turn over card A and card D

Did you get this one wrong? This is called the Wason selection task and was devised by Peter Cathcart Wason in 1966. It may well have fooled you! Psychology researchers have shown only about 5% of the population gets it right. So well done if you did get it right. Though we think we act logically, often we don't. Most people think the answer is to turn over card A and card C which wouldn't prove

Why? The statement "every card with a vowel on one side has an even number on its opposite side" can only be shown to be false if there was an odd number on the opposite site of one known to be a vowel card (ie card A) and/or a vowel on the opposite side of one known to be an odd numbered (i.e. card D).

Question Four

You must turn over card B and card C

Later in 1992 researchers Cosmides and Tooby found that people could do this task and select the correct cards, if they were given a version of the test that was relevant to a social situation, like the one here about whether someone is old enough to buy fireworks. Most people get this right even though they found the first hard and logically they are exactly the same problem.

We are better at logical thinking that is socially relevant - we are social creatures more than logical ones, which is why we need to train our skills in logic.

Question Five

https://en.wikipedia.org/wiki/Eight_queens_puzzle

https://upload.wikimedia.org/wikipedia/commons/thumb/d/d7/Chessboard480.svg/208px-Chessboard480.svg.png an example