2014-RU-04-EN Carrot Storehouses

Body

Ruby Rabbit has 32 storehouses with carrots for the next winter for her large family. Storehouses stand in a row. Every storehouse has some amount of carrots, for example, the picture shows that there are 2, 5, 3 and 1 tons of carrots in the first four storehouses. Other storehouses are marked with a star.

Ruby made some computations. First, she organized the houses into pairs and computed the number of carrots for each pair. The picture shows that there are 7 and 4 tons in the first two pairs. Then she paired the pairs, and again computed the amount of carrots. So, there are 11 tons of carrots in the first four storehouses. She continued in that manner, filled all rectangles on the picture with numbers, and finally computed the total amount of carrots she has got.

Imagine now, Ruby wants to compute the amount of carrots in a segment of consecutive storehouses, for example, from the 8th to the 22nd storehouse (they are market with a brace). She does not need to add all the amounts from these houses, she may add the amounts from the rectangles marked with red. So, she needs to sum up only 4 numbers instead of 15.

Question

What is a minimal amount of numbers that are always enough to add for Ruby if she wants to compute the carrots in any segment of consecutive storehouses?

Answer

A) 6
B) 7
C) 8
D) 15

Explanation

Internal Use

Wording

Segment tree

Comments

Ilya Posov, iposov@gmail.com, 2014-05-05, The choice of wrong answers for the multiple choice questions is quite arbitrary. The idea was to have a lot of small answers (less than 10).
Ilya Posov, iposov@gmail.com, 2014-06-01, Applied suggested changes in the wording of the statement. Changed "millon tones of carrots" to "thousand carrots".
Willem van der Vegt, w.van.der.vegt@windesheim.nl changed thousand carrot into tons of carrots and changed the rabbit in a named female. The alternatives have changed, because it is easy to find a (wrong) solution using 7 numbers to add, and 4 is not really a foreseeable solution (except for the given example). The background color for the cells in the example is changed by Eslam Weegand, eslam.wageed@gmail.com

Graphics

All graphics is self-drawn

Files

All additional files for this task (graphics, scripts, etc.)
2014-RU-04-EN.odt (this file)
2014-RU-04-EN.svg (inkscape source)

Authorship

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