

Several people had questions about calculating byteOffset for the binary map file
 based on Row & Col sent in, assuming you've perhaps swapped them to make sure Row > Col
 since we're only storing the lower-left triangle.
 (Let's NOT calculate RRN from Row & Col first, and then calculate byteOffset based on RRN).

It's: $\text{sizeofHeaderRec} + \text{sizeofRowsBeforeThisRow} + \text{sizeofColsBeforeThisColumnInThisRow}$
 where all numbers are shorts (2 bytes)

Let's assume HeaderRec is just a single short (check the specs, I don't remember).

Suppose you had a 5x5 square matrix (N = 5).

.	0	1	2	3	4
0					
1		10			
2		20	30		
3		40	50	60	
4		70	80	90	99

Stored in the file it's:

DATA VALUES:	HeaderRec	10	20	30	40	50	60	70	80	90	99
BYTE NUMBERS:	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21

Say we want Row 4, Col 3 which has the value 99.

$\text{sizeofHeaderRec} = 2$ bytes

$\text{sizeofRowsBeforeThisRow} = (1 + 2 + 3) * 2 \text{ bytes} = 12 \text{ bytes}$

$\text{sizeofColsBeforeThisColumnInThisRow} = (1 + 2) * 2 \text{ bytes} = 6 \text{ bytes}$

$\text{byteOffset} = 2 + 12 + 6 = 20$ OK, that's right

What's the generic formula for the sum of the first M numbers? $(M * (M+1)) / 2$

In the sizeofRows... calculation that's the sum of the first Row-1 numbers, or

$$((\text{Row}-1) * (\text{Row}-1+1)) / 2$$

In the sizeofCols... calculation that's the sum of the first Col-1 numbers, or

$$((\text{Col}-1) * (\text{Col}-1+1)) / 2$$

Say we want Row 1, Col 0, which has the value 10.

$$\begin{aligned} \text{byteOffset} &= 2 + ((R * (R-1)) / 2) + ((C * (C-1)) / 2) \\ &= 2 + ((1 * 0) / 2) + ((0 * -1) / 2) \\ &= 2 + 0 + 0 \\ &= 2 \text{ OK, that's right} \end{aligned}$$