

2013 AP® COMPUTER SCIENCE A FREE-RESPONSE QUESTIONS

Complete the SkyView constructor below.

```
/** Constructs a SkyView object from a 1-dimensional array of scan data.  
 * @param numRows the number of rows represented in the view  
 * Precondition: numRows > 0  
 * @param numCols the number of columns represented in the view  
 * Precondition: numCols > 0  
 * @param scanned the scan data received from the telescope, stored in telescope order  
 * Precondition: scanned.length == numRows * numCols  
 * Postcondition: view has been created as a rectangular 2-dimensional array  
 * with numRows rows and numCols columns and the values in  
 * scanned have been copied to view and are ordered as  
 * in the original rectangular area of sky.  
 */  
public SkyView(int numRows, int numCols, double[] scanned)
```

Part (b) begins on page 19.

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- (b) Write the `SkyView` method `getAverage`, which returns the average of the elements of the section of `view` with row indexes from `startRow` through `endRow`, inclusive, and column indexes from `startCol` through `endCol`, inclusive.

For example, if `nightSky` is a `SkyView` object where `view` contains the values shown below, the call `nightSky.getAverage(1, 2, 0, 1)` should return `0.8`. (The average is $(1.1 + 1.4 + 0.2 + 0.5) / 4$, which equals `0.8`). The section being averaged is indicated by the dark outline in the table below.

view	0	1	2
0	0.3	0.7	0.8
1	1.1	1.4	0.4
2	0.2	0.5	0.1
3	0.9	0.6	1.6

Class information repeated from the beginning of the question

```
public class SkyView  
  
private double[][] view  
public SkyView(int numRows, int numCols, double[] scanned)  
public double getAverage(int startRow, int endRow,  
                        int startCol, int endCol)
```

WRITE YOUR SOLUTION ON THE NEXT PAGE.