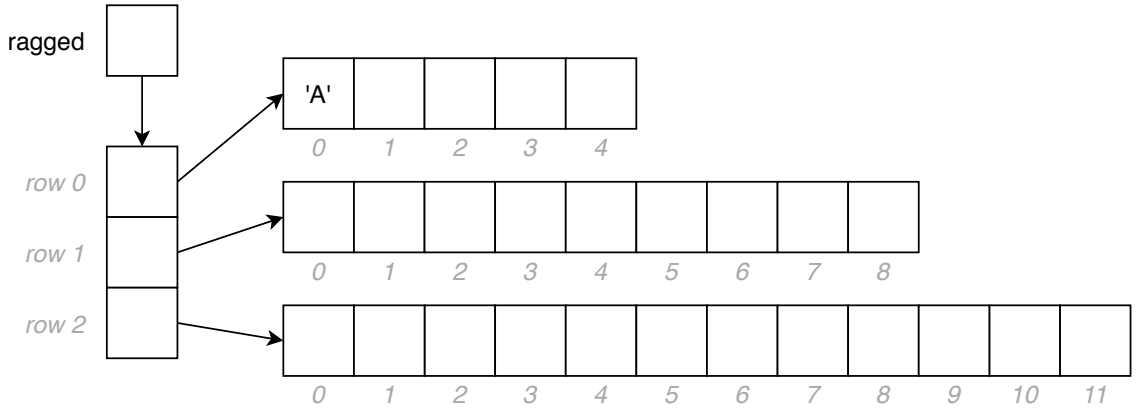
Model 1 Ragged Array

```
1  public class Ragged {
2      public static void main(String[] args) {
3          char[][] ragged = new char[3][];
4          ragged[0] = new char[5];
5          ragged[1] = new char[9];
6          ragged[2] = new char[12];
7
8          char letter = 'A';
9          ragged[0][0] = letter;
10         letter++;
11         System.out.println(letter);
12     }
13 }
```



Questions (20 min) Start time:

1. Based on the `main` method above:

a) How many rows are in this 2D array? 3

b) How many columns are in the first row? 5

c) How many columns are in the second row? 9

d) How many columns are in the third row? 12

2. Run the program. What is the value of `letter` at the end? `'B'`

3. Describe what happens when you increment a `char` variable.

The next letter in the (Unicode) alphabet is assigned.

Note: Characters in Java are represented by 16-bit integers.

4. Summarize the main difference in shape between the "rectangular" array of **??** and the "ragged" array of Model 1.

Rectangular arrays have the same number of columns on each row. Ragged arrays do not.

5. Examine your code for Question **??**. Would it work for the `ragged` array? Explain why or why not.

It would still work, because the inner loop processes only the number of elements in that particular row.

6. Complete the following steps to fill the contents of the `ragged` array:

a) Copy your code from Question **??** and paste it in Model2.java at the end of the main method. Replace the variable `table` with `ragged` so that it compiles.

b) Comment out lines 9–11 so that `letter` is not modified and printed before the first loop.

c) Modify your code so that it sets the first element of `ragged` to `'A'`, the second element to `'B'`, and so on, until the last element is set to `'Z'`. (Hint: Move lines 9–10 into the loop.)

d) Copy your code from Question **??** again and paste it in Model2.java at the end of the main method. Run the program to verify that all letters were set correctly.

e) Paste your code from step c) in the space below:

```
for (int row = 0; row < ragged.length; row++) {
    for (int col = 0; col < ragged[row].length; col++) {
        ragged[row][col] = letter;
        letter++;
    }
}
```

7. Which kind of 2D array (rectangular or ragged) would you use to represent the lanes of a highway, where the array elements are car objects? Justify your answer.

A ragged array, because there could be a different number of cars in each lane of the highway.

8. Which kind of 2D array (rectangular or ragged) would you use to represent a matrix in mathematics, where the array elements are integers? Justify your answer.

A rectangular array, because matrices have the same number of columns on each row.