Example 2

- Find the number of ratings above the value of the parameter.

```
public int countAbove(int[][] rating, int num) {
  int count = 0;
  for (int row = 0; row < rating.length; row++) {
    for (int col = 0; col < rating[0].length; col++) {
      if (rating[row][col] > num)
         count++;
    }
  }
  return count;
}
```

number of rows

number of columns

Example 3

- Print the average rating for the movie in column 3.

				movie	
		0	1	2	3
reviewer	0	4	6	2	5
	1	7	9	4	8
	2	6	9	3	7

```
int sum = 0;

for (int row = 0; row < rating.length  ; row++) {

      sum += rating[ row ][ 3  ];
}

System.out.println((double) sum / rating.length  );
```

Ragged Arrays

- Since a 2D array is a 1D array of references to 1D arrays, each of these latter 1D arrays (rows) can have a different length.

- How? Use an ***initializer list***.

row 1 row 2

```
int[][] rating = { {3,5,7,9}, {4,2},
                   {5,7,8,6}, {6} };
```

3	5	7	9
4	2		
5	7	8	6
6			

Example 3 Revisited

- Print the average rating for the movie in column 3.

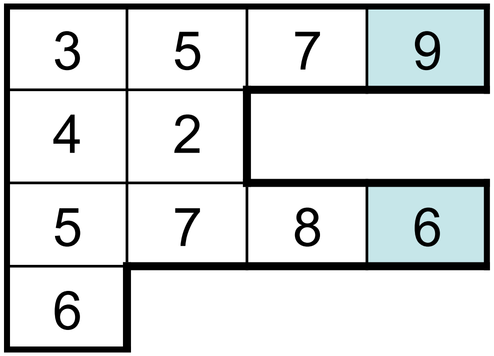
```
int count = 0;
double sum = 0;

for (int row = 0; row < rating.length; row++) {

    if (rating[row].length > 3) {

        sum += rating[row][3];
        count++;
    }
}

if (count > 0) {
   System.out.println((double) sum / count);
}
```

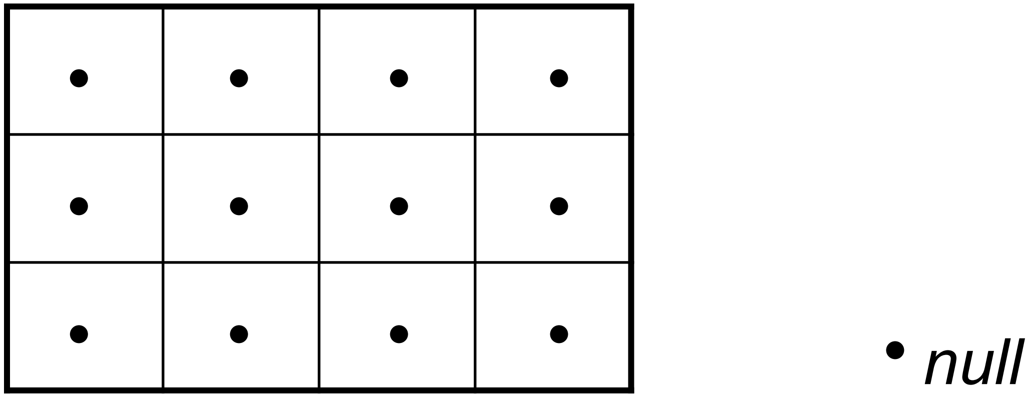


3	5	7	9
4	2		
5	7	8	6
6			

2D Array of Object References

- Recall that creating an array of object references fills the array with `null` values.
- Example:

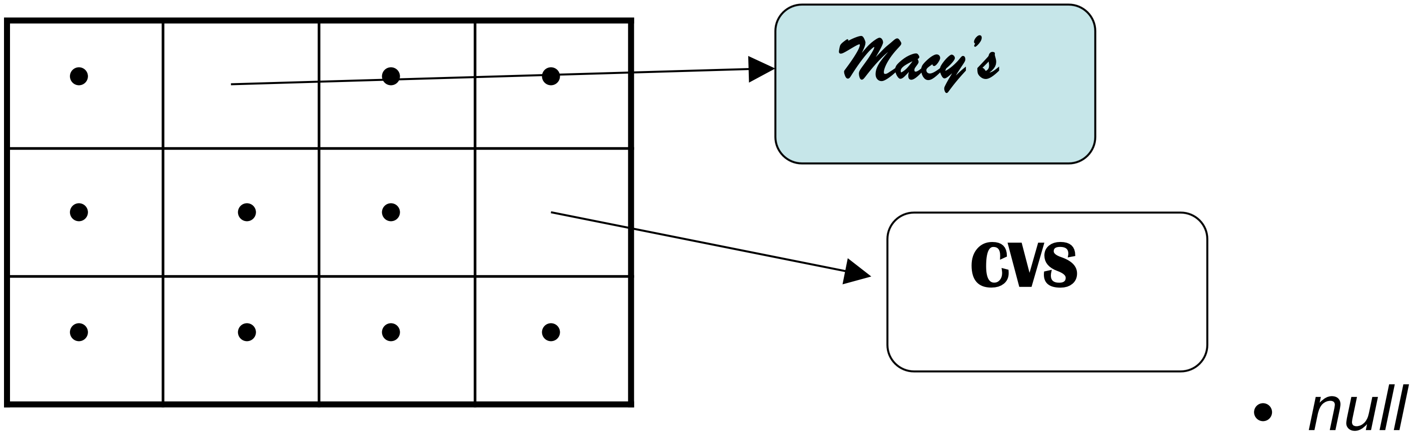
```
GiftCard[][] family = new GiftCard[3][4]
```



2D Array of Object References

- Need to create the objects and assign the references to the array elements.
- Example:

```
family[0][1] = new GiftCard(“Macy’s”, 50.0);
family[1][3] = new GiftCard(“CVS”, 15.0);
```



Example 4

- Print the total value of the gift cards for each family member (rows): `printValueOfRows(family);`

```
public static void printValueOfRows(_GiftCard[][]_ data) {
 for (int row = 0; row < __data.length_____; row++) {
  double total = __0.0____;  // find total for the row
  for (int col = 0; col < _data[row].length; col++) {
   if (data[row][col] != ____null___) {
    total += data[row][col].getBalance();
   }
  }
  System.out.println(“Row “ + row + “: $“ + total);
 }
}
```