Java-2DArrays

Creating a 2D Array in Java

- A 2D array is an array of arrays

- each inner array is a "row"

Declaring a 2D Array

```
int[][] array2D = new int[rows][columns];
```

Initializer lists for 2D Array

```
int[][] array2D = { {1, 2, 3},
                    {4, 5, 6},
                    {7, 8, 9} };
```

Accessing Elements in a 2D Array

A 2D array is an array of arrays, so accessing an element requires two indices: one for the outer array and one for the inner array.

```
int element = array2D[rowIndex][columnIndex];
```

Example:

```
int[][] array2D = { {1, 2, 3},
                    {4, 5, 6},
                    {7, 8, 9} };
int element = array2D[1][2];   // element = 6
```

Accessing a Whole Row of a 2D Array

To access a whole row of a 2D array, you can use a single index and a for loop to iterate over the elements in the row.

```java
int[] row = array2D[rowIndex];

for (int i = 0; i < row.length; i++) {
    // Process each element in the row
}
```

Example:

```java
int[][] array2D = { {1, 2, 3},
                    {4, 5, 6},
                    {7, 8, 9} };
int[] row = array2D[1];   // row = {4, 5, 6}
```

Enhanced for loops

For an enhanced for loop, remember that the 2D array is actually an array of arrays

```java
for (type[] row : array2D) {
    for (type element : row) {
        // Process each element in the 2D array
    }
}
```

Example:

```java
int[][] array2D = { {1, 2, 3},
                    {4, 5, 6},
                    {7, 8, 9} };
for (int[] row : array2D) {
    for (int element : row) {
        System.out.print(element + " ");
    }
    System.out.println();
}
```