Java 2D array

Array

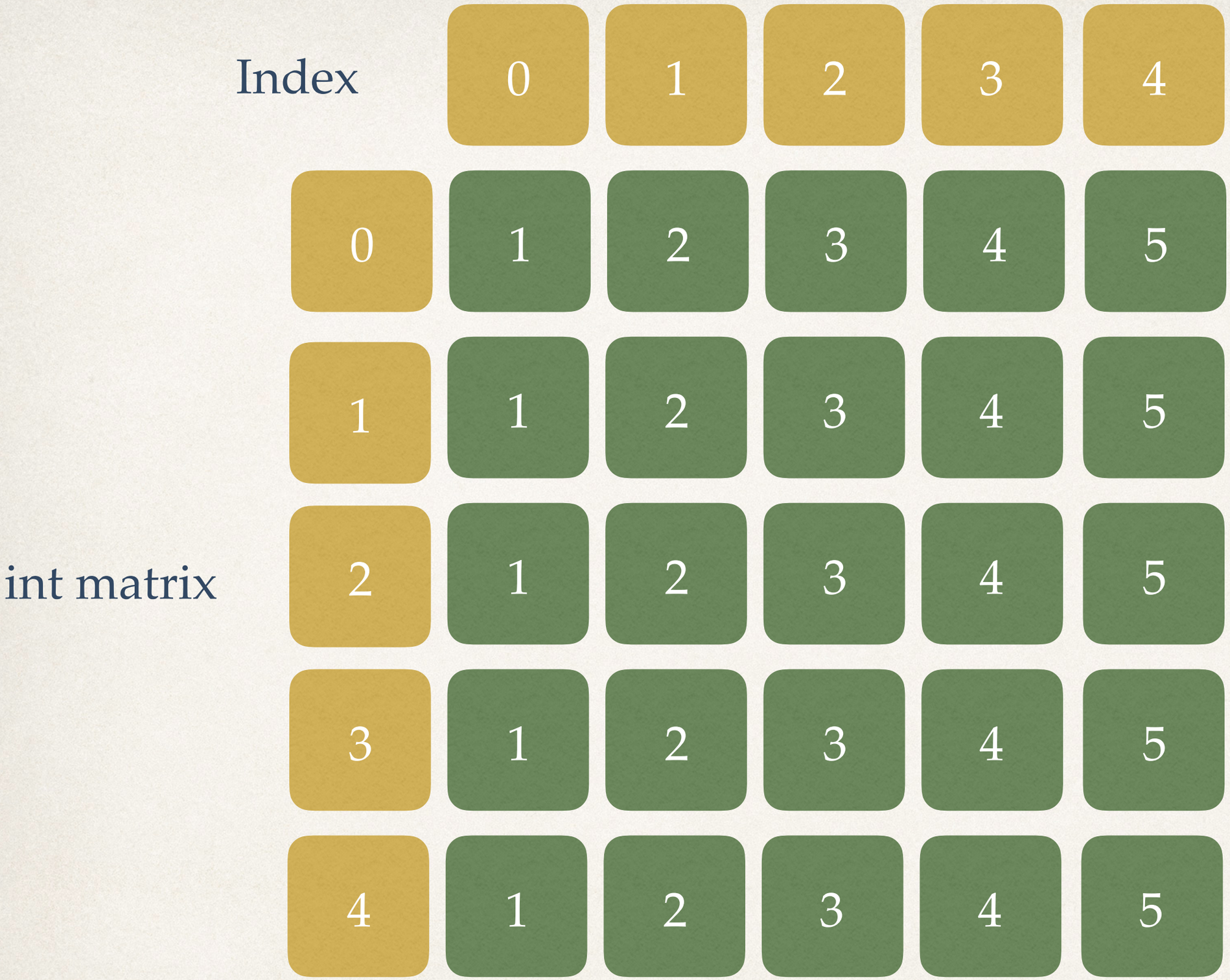
- Represent a list of Same data type
- Everything can be represent as array in Java
- Created with a initial value
- Is an “object” so it will allocate memory

An array of array - 2D array
Or Matrix

- Represent a grid of data
- Data spread in 2 dimension
- A grid of same type of data

Access an 2D array

- Access an element in array with its index
- Access an element in 2d array with its coordinate


Index
0 1 2 3 4
0 1 2 3 4 5
1 1 2 3 4 5
2 1 2 3 4 5
3 1 2 3 4 5
4 1 2 3 4 5
int matrix

Important Matrix attribute

- int[][] matrix
- matrix.length return number of rows in matrix
- matrix[index].length return number of columns in matrix

```
public class MyProgram {
        public static void main(String[] args) {

            // create an 4*5 matrix
            int[][] matrix = new int[4][5];

            // rows is now equals to 4
            int rows = matrix.length;

            // columns is now equals to 5
            int columns = matrix[0].length;

        }
}
```

Go through a matrix

- Looping with nested for loop
- Control index with meaningful variable name
- DO NOT go across the index boundary

```
public class MyProgram {
        public static void main(String[] args) {

            // create a 3*3 matrix
            int[] matrix = new int[3][3];


            for (int row = 0; row < matrix.length; row ++) {
                for (int column = 0; column < matrix[0].length; column++) {
                    System.out.println(matrix[row][column]);
                }
            }

        }
}
```

Print out 1 2 3 4 5 6 7 8 9 10