Throughout this lesson, you've learned about Strings and arrays—key building blocks in Java programming. These fundamentals are essential stepping stones on your journey to becoming a software developer. If you need a quick refresher, don't hesitate to revisit the earlier readings and videos. Now, let's dive in and put your new skills to use! You've got this!

In this lab, you'll help Kyle build a simple program for keeping track of various superheroes and the years they were introduced. Kyle isn't sure how best to develop his program, so you tell him that arrays are probably the best way to store and manage this information efficiently.

Goal

Can you help Kyle develop his program by printing the superheroes' names and dates of introduction, changing that information in an array of Strings and int, and comparing the length of the String and int arrays?

To give Kyle a hand, you'll need to write some code to get the job done. Let's get started!

🖥️ Note: When you encounter this icon, it's time to get into your integrated development environment (IDE) and start coding!

In your lab environment, open IntelliJ by double-clicking on the icon.

You will be brought to the starter code when the IntelliJ IDE opens.

Before you begin, explore the starter code to ensure you're ready to get coding! Then you'll begin helping Kyle develop his program by printing out superhero names and the years they were introduced.

Tip

Remember, in Java, `//` is used to create single-line comments. Any text following `//` will be ignored by the compiler, meaning that it won't execute as part of your program.

If you delete a TODO statement but leave the `//` in place, any code you write on that line will remain commented out and won't run. To ensure your code works properly, remove the `//` as well.

Step 1: Explore the starter code

🖥️ It's time to get coding!

The **`main`** method of the **`main`** class is placed in a file named **`Main.java`**'. As soon as you open IntelliJ, you will be presented with the following starter code:

```
public class Main {

public static void main(String[] args) {

        String[] superheroes = {"Batman", "Superman", "Wonder Woman", "Spider-Man",
"Iron Man"};

        int[] introductionYears = {1939, 1938, 1941, 1962, 1963};

    }

}
```

Tip

Always follow best practice when naming files: The class name should be the same as the file name.

In the starter code, within the **`main`** method, there is a predefined array of Strings with superhero names and another array of int with the year of introduction. Remember that the term TODO indicates the position within the program where you have to type in your own code.

Step 2: Print every superhero name stored in the String array

🖥️ It's time to get coding!

TODO 1: Print the names of the superheroes by accessing the index of the String element. For example, **`System.out.println(superheroes[0]);`** will fetch you “Batman”.

Instructions:

- Remove the TODO 1 block and write a statement to print the names of the superheroes from the array of Strings one by one.
- Run the code using the IDE.
- Print the superheroes' names from the array of String.
- Compare the output to the expected results.

```
// Print the names of superheroes

System.out.println("Superhero Names:");

//TODO 1: Print all the 5 superheroes names as suggested in the example
```

Expected output:

```
Superhero Names:

Batman

Superman

Wonder Woman

Spider-Man

Iron Man
```

Step 3: Print the years of introduction stored in the int array

🖥️ It’s time to get coding!

TODO 2: Once you’ve printed all the superhero names from the String array, it's time to print the int array for the year these superheroes were introduced.

Instructions:

- Remove the TODO 2 block and write the statement to print the **`introductionYear`** of the superheroes from the int array one by one.
- Run the code in your IDE.
- Print the introduction dates from the array of int.

- Compare the output to the expected results.

```
// Print the introduction years

System.out.println("Introduction Years:");

//TODO 2: Print the introductionYear of the superheroes.
```

Expected output:

```
Superhero Names:

Batman

Superman

Wonder Woman

Spider-Man

Iron Man

Introduction Years:

1939

1938

1941

1962

1963
```

Well done! Now you can declare and initialize a String array and an int array to fetch text String and number int variables. Unfortunately, Kyle made a mistake listing out his superheroes, and you need to change the name and introduction date of one of them.

Step 1: Change the name of one of the superheroes in the String array.

🖥️ It's time to get coding!

TODO 3: Here, you need to change or modify the name of one of the superheroes. To do this, you can use a statement like `superheroes[0] = "Black Widow";`. Can you guess which element of the array you would change with this statement? That's right, the first!

Instructions:

- **Remove the first TODO 3a block and write a statement to print the original name of the superhero at the third position (Remember: Position and index aren't the same thing!)**
- **Remove the second TODO 3b block and write a statement to modify the name of the superhero at the third position to "Thor".**
- **Remove the third TODO 3c block and write a statement to print the new modified name of the superhero at the third position.**
- **Run the code in your IDE.**
- **Print the original and modified superhero name.**
- **Compare the output to the expected results.**

```
// TODO 3a: print the original name of the third superhero

// TODO 3b: modify the third superhero name

// TODO 3c: print the modified name of the third superhero
```

Expected output:

```
Superhero Names:

Batman

Superman

Wonder Woman

Spider-Man

Iron Man

Introduction Years:

1939

1938

1941

1962
```

```
1963

Original superhero name at position 3: Wonder Woman

Modified superhero name at position 3: Thor
```

Step 2: Change the year of introduction of the changed superhero

🖥️ It's time to get coding!

TODO 4: Now that you changed the superhero at position 3, you might have noticed that their introduction date needs to change too. Kyle tells you that Thor was introduced in 2011. This means you must change the related introduction date in the int array.

Instructions:

- **Remove the first TODO 4a block and write a statement to print the modified superhero's original year of introduction.**
- **Remove the second TODO 4b block and write a statement to change the year of the modified superhero's introduction to 2011.**
- **Remove the third TODO 4c block and write a statement to print the modified year of introduction.**
- **Run the code in your IDE.**
- **Print the original and modified years of introduction.**
- **Compare the output to the expected results.**

```
// TODO 4a: print the original year of introduction of the third superhero

// TODO 4b: modify the year of introduction of the third superhero

// TODO 4c: print the modified year of introduction of the third superhero
```

Expected output:

```
Superhero Names:

Batman

Superman

Wonder Woman

Spider-Man

Iron Man

Introduction Years:
```

```
1939

1938

1941

1962

1963

Original superhero name at position 3: Wonder Woman

Modified superhero name at position 3: Thor

Original introduction year for superhero at position 3: 1941

Modified introduction year for superhero at position 3: 2011
```

Now that you've made some changes to Kyle's list of superheroes, you'll probably want to check that you made no errors, like accidentally missing an introduction date or superhero name. To do this, you can write a statement to confirm that the length of the String array and of the int array are the same.

Step 1: Check that the String array and the int array contain the same number of elements

🖥️ It's time to get coding!

TODO 5: Here, you must check that the length of the array containing the superheroes' names is the same as the length of the array of their introduction year. To do this, you can use a statement like `arrayName.length`.

Tip

`length` prints the number of elements in an array.

For example, If there is an int array named `numberOfBuildings`, you can use `numberOfBuildings.length` to find the length of the array.

Instructions:

- **Remove the first TODO 5a block and write a statement to print the length of the array containing the superheroes' names.**
- **Remove the second TODO 5b block and write a statement to print the length of the array containing the superhero's year of introduction.**

- **Run your code in your IDE.**
- **Print the lengths of each array.**
- **Compare the output of your program to the expected results.**

```
// TODO 5a: print the length of the array containing superhero names

// TODO 5b: print the length of the array containing superhero year of introduction
```

Expected Output:

```
Superhero Names:

Batman

Superman

Wonder Woman

Spider-Man

Iron Man

Introduction Years:

1939

1938

1941

1962

1963

Original superhero name at position 3: Wonder Woman

Modified superhero name at position 3: Thor

Original introduction year for superhero at position 3: 1941

Modified introduction year for superhero at position 3: 2011

Total superheroes names in String array: 5

Total superheroes introduction year in int array: 5
```