

Computer Programming Fundamentals

CS 152

Professor: Leah Buechley

TAs: Melody Horn, Noah Garcia, Andrew Geyko, Juan Ormaza

Time: MWF 10:00-10:50am

https://handandmachine.cs.unm.edu/classes/CS152_Fall2021/

ASSIGNMENT 2 GRADED

A FEW WONDERFUL SUBMISSIONS

GRADING CLARIFICATION:

No assignments accepted after 3 late days

FOR ASSIGNMENT 2 ONLY:

If you turn in all other assignments, you have the option of dropping your assignment 2 grade from your average

**IF YOU HAVEN'T TURNED IN
ASSIGNMENT 2, COME SEE ME!**

ASSIGNMENT 3 POSTED

**COLLOQUIUM TODAY AT 2PM
WENDY JU, CORNELL
ROBOTS & SELF DRIVING CARS**



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Human–Robot Interaction

What if a car wants you to listen to its voiced instructions or a chair wants you to move out of its way, how do you react to it?



Patricia Kuharic

Featured



by Alexandra Chang

As automated machines—driverless cars, robot vacuums, aisle-cleaning robots—become increasingly present, so do questions about how best to design these machines to interact with a world of people. Wendy Ju, Information Science, Jacobs Technion-Cornell Institute at Cornell Tech, studies this human-robot interaction. She spends a lot of time watching and parsing people’s actions.

“It’s delightful for me to watch people move around in a space,” says Ju. “We are not always thinking about the communicative signaling

Related Stories



April 22nd, 2020

‘Ghostdrivers’ test cultural reactions to autonomous cars

MET GALA + CS!



Iris van Herpen



**OPEN INTELLIJ
& CODE FROM MONDAY**

**CREATE A NEW JAVA CLASS CALLED
Wednesday.java**

TODAY: ARRAYS

**ARRAYS ARE LISTS
OR COLLECTIONS OF THINGS
ALL OF THE SAME TYPE**

EXAMPLES OF ARRAYS

```
{1, 2, 3, 4, 5}
```

```
{5.0, 6.0}
```

```
{"cat", "dog", "llama", "bear"}
```

```
{'a', 'b', 'c'}
```

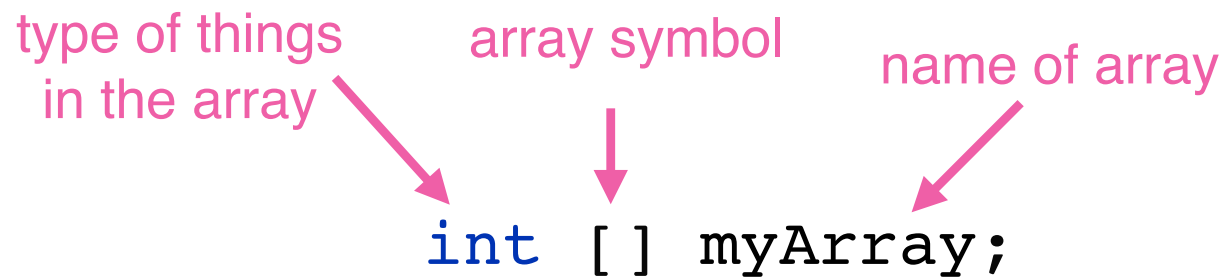
DECLARING AN ARRAY

type of things
in the array

array symbol

name of array

```
int [] myArray;
```

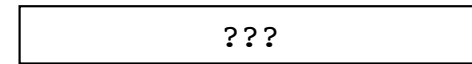
The diagram illustrates the components of the array declaration `int [] myArray;`. Three pink arrows point from descriptive text to the corresponding parts of the code: one from 'type of things in the array' to 'int', one from 'array symbol' to '[]', and one from 'name of array' to 'myArray'.

this tells your program you'll be using an
array and declares its name

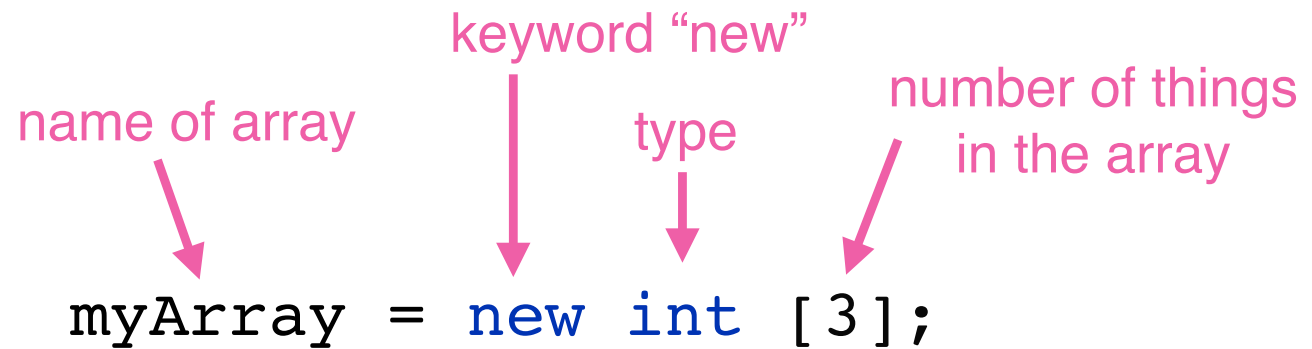
```
int [ ] myArray;
```

in the computer's
memory somewhere

myArray



THEN YOU CREATE THE ARRAY



A diagram explaining the components of an array creation statement in Java. The code is `myArray = new int [3];`. Four pink arrows point from explanatory labels to specific parts of the code: 'name of array' points to `myArray`, 'keyword "new"' points to `new`, 'type' points to `int`, and 'number of things in the array' points to `[3]`.

```
myArray = new int [3];
```

name of array

keyword "new"

type

number of things in the array

this tells your program the size of your array
and allocates space in memory for the array

in java the size of the array cannot change

```
int [] myArray;  
myArray = new int [3];
```

in the computer's
memory somewhere

myArray

???	???	???
-----	-----	-----

CAN DO THIS ALL TOGETHER

```
int [] myArray = new int [3];
```

STORING VALUES IN AN ARRAY

location, "index"
starts at 0

name of array

value

```
myArray[0] = 0;  
myArray[1] = 10;  
myArray[2] = 20;
```

The diagram illustrates the syntax for storing values in an array. It shows three lines of code: `myArray[0] = 0;`, `myArray[1] = 10;`, and `myArray[2] = 20;`. Three pink arrows point to specific parts of the code: one points to `myArray` with the label 'name of array', another points to the first `0` in `[0]` with the label 'location, "index" starts at 0', and a third points to the `0` after the equals sign with the label 'value'.

this stores actual values in the array

PUTTING IT ALL TOGETHER

```
int [] myArray;  
myArray = new int [3];  
myArray[0] = 0;  
myArray[1] = 10;  
myArray[2] = 20;
```

in the computer's
memory somewhere

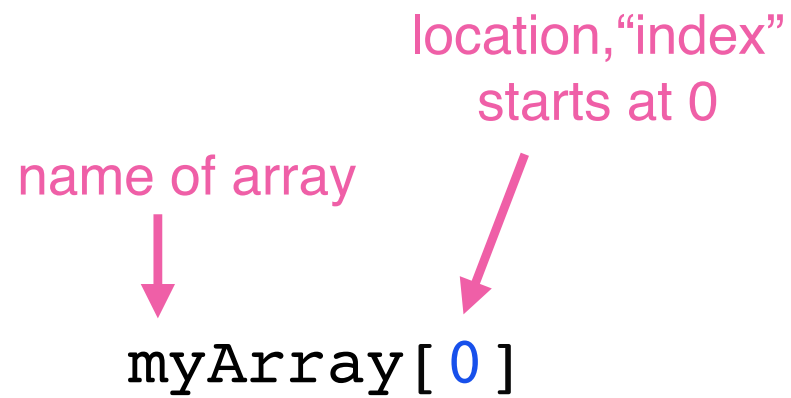
myArray

0	10	20
0	1	2

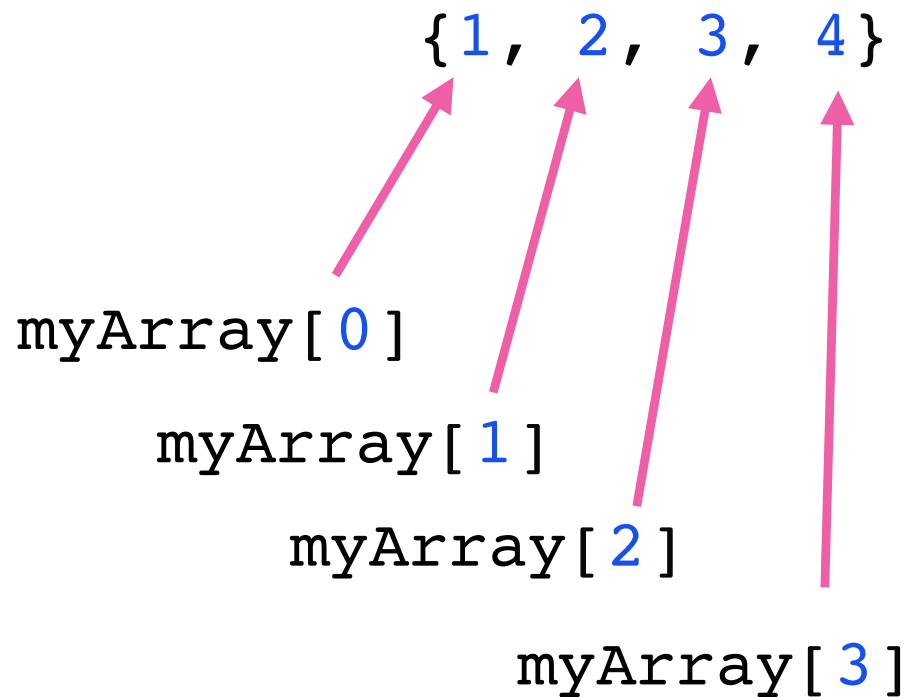
ACCESSING AN ARRAY ITEM

name of array
↓
myArray [0]

location, "index"
starts at 0
↙

The diagram illustrates the components of the array access notation 'myArray [0]'. A pink arrow points from the text 'name of array' to the 'myArray' part of the code. Another pink arrow points from the text 'location, "index" starts at 0' to the '0' inside the brackets. The number '0' is highlighted in blue.

ACCESSING AN ARRAY ITEM



ACCESSING AN ARRAY ITEM

```
int [] myArray;  
myArray = new int [3];  
myArray[0] = 0;  
myArray[1] = 10;  
myArray[2] = 20;  
System.out.println(myArray[0]);
```

GETTING THE LENGTH OF AN ARRAY

```
myArray.length
```

```
int [] myArray;  
myArray = new int [3];  
myArray[0] = 0;  
myArray[1] = 10;  
myArray[2] = 20;  
System.out.println(myArray[0]);  
System.out.println(myArray.length);
```

questions?

ANOTHER WAY TO DECLARE & CREATE AN ARRAY IN ONE LINE

type of things
in the array

array symbol

name of array

value of array

```
int [] myArray = {1, 2, 3, 4};
```

A diagram illustrating the components of the code snippet `int [] myArray = {1, 2, 3, 4};`. Four pink arrows point from descriptive labels to specific parts of the code: 'type of things in the array' points to `int`, 'array symbol' points to `[]`, 'name of array' points to `myArray`, and 'value of array' points to the curly braces containing the numbers `{1, 2, 3, 4}`.

BUT (WEIRDLY) YOU CAN'T DO THIS

```
int [] myArray;  
myArray = {1, 2, 3, 4};
```

java: illegal start of expression

FOR LOOPS ARRAYS

```
int [] myArray;  
myArray = new int[3];  
  
for (int i=0; i<3; i++) {  
    myArray[i] = i*10;  
}
```

if you want to do anything to the elements in an array or do anything that uses the elements in an array, use a for loop

FOR LOOPS ♥ ARRAYS

condition: (i < length of array)

```
for (int i=0; i<3; i++) {  
    myArray[i] = i*10;  
    System.out.println(myArray[i]);  
}
```

use i to reference array items
loop will access every item in array

FOR LOOPS ♥ ARRAYS

condition: (i < length of array)



```
for (int i=0; i<myArray.length; i++) {  
    myArray[i] = i*10;  
    System.out.println(myArray[i]);  
}
```


questions?

**LET'S CREATE AN ARRAY OF
RANDOM NUMBERS**

**LET'S CREATE AN ARRAY OF
RANDOM NUMBERS**

**FIND THE LARGEST NUMBER
IN THE ARRAY**

**FIND THE SMALLEST NUMBER
IN THE ARRAY**

A FULL PROGRAM

```
import java.lang.Math;

public class Wednesday {

    public static void main(String[] args) {
        double [] randomArray = new double[10];

        for (int i=0;i<randomArray.length;i++) {
            randomArray[i] = Math.random()*100;
            System.out.println(randomArray[i]);
        }

        minMax(randomArray);
    }

    static void minMax (double [] myArray) {
        double min = 100;
        double max = -1;
        for (int i=0;i<myArray.length;i++) {
            if (myArray[i] < min) {
                min = myArray[i];
            }
            if (myArray[i] > max) {
                max = myArray[i];
            }
        }
        System.out.println("The smallest number is: " + min);
        System.out.println("The largest number is: " + max);
    }
}
```