



Practice-5. Array of objects

Lecturer: T.Kuchkorov

OOP | 16.03.2022

Creating classes in Java

In this hands-on activity, students will learn the skills of creating an array of objects for particular class in the Java programming language, creating objects using different constructors (default and parametrized constructors) and access to object as an element of array. Also, students will acquire the initializing objects with user-defined Randomizer class and its static methods in constructors.

Classwork Example.

Create Phone class with following description:

Class name: **Phone**

Attributes:

- model: String
- name: String
- year: int
- price: double

Methods:

- toString(): String (public)
- setter methods: void
- getter methods: Type

Constructors:

- default constructor
- parametrized constructor

```
public class Phone {  
    private String model;  
    private String name;  
    private int year;  
    private double price;  
  
    public Phone(String model, String name, int year, double price) {  
        this.model = model;  
        this.name = name;  
        this.year = year;  
        this.price = price;  
    }  
  
    public String getModel() {  
        return model;  
    }  
}
```

```

    public void setModel(String model) {
        this.model = model;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public int getYear() {
        return year;
    }

    public void setYear(int year) {
        this.year = year;
    }

    public double getPrice() {
        return price;
    }

    public void setPrice(double price) {
        this.price = price;
    }

    @Override
    public String toString() {
        return "Phone{" +
            "model='" + model + '\'' +
            ", name='" + name + '\'' +
            ", year=" + year +
            ", price=" + price +
            '\'';
    }
}

```

Note: You can create constructor, setter, getter and toString method using Alt+Insert shortcuts as given previous practical work.

Now to create an array of created class objects, we enter the following program code into the Main class.

Main.java sinfi

```
public class Main {

    public static void main(String[] args) {
        Phone phones[] = new Phone[5];
        for (int i = 0; i < phones.length; i++) {
            phones[i] = new Phone(RandomGenerator.stringGenerator(),
                                   RandomGenerator.stringGenerator(),
                                   RandomGenerator.intGenerator(),
                                   RandomGenerator.doubleGenerator());
        }

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

The RandomGeneration class here and its methods are additionally created to read random values for attributes in the String, Int, and Double categories, respectively.

RandomGenerator.java sinfi

```
import java.util.Random;

public class RandomGenerator {

    public static String stringGenerator(){
        StringBuilder name = new StringBuilder();
        char letters[] = {'A','B','C','e','b','d','f','E','l','m','n'};
        Random random = new Random();
        int size;
        int randomIndex;
        size = random.nextInt( bound: 5)+3;
        for (int i = 0; i < size; i++) {
            randomIndex = random.nextInt(letters.length);
            name.append(letters[randomIndex]);
        }
        return name.toString();
    }
}
```

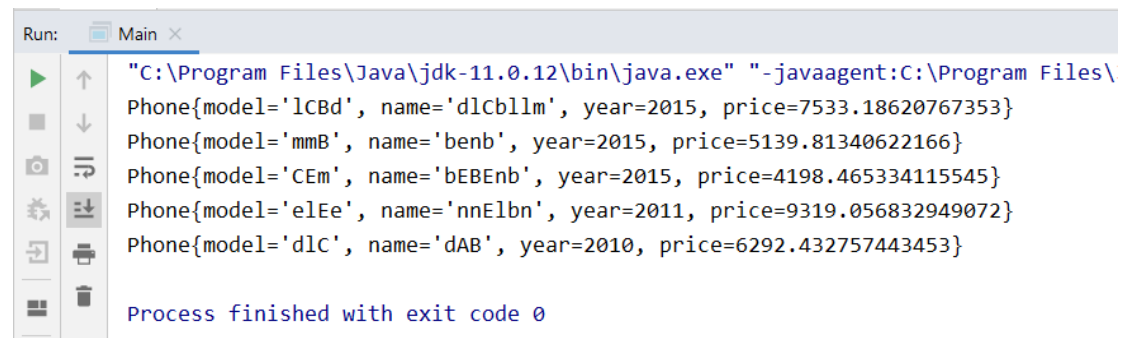
```

public static int intGenerator(){
    int number=0;
    Random random = new Random();
    number = random.nextInt( bound: 11)+2010;
    return number;
}

public static double doubleGenerator(){
    double num=0;
    Random random = new Random();
    num = random.nextDouble()*10000;
    return num;
}
}

```

Program Result:



```

Run: Main
"C:\Program Files\Java\jdk-11.0.12\bin\java.exe" "-javaagent:C:\Program Files\
Phone{model='lCBd', name='dlCblm', year=2015, price=7533.18620767353}
Phone{model='mmB', name='benb', year=2015, price=5139.81340622166}
Phone{model='CEm', name='bEBEnb', year=2015, price=4198.465334115545}
Phone{model='elEe', name='nnElbn', year=2011, price=9319.056832949072}
Phone{model='dlC', name='dAB', year=2010, price=6292.432757443453}

Process finished with exit code 0

```

Classwork task.

Class name: **User**

Attributes:

- username: *String*
- password: *String*
- birthdate: *Date*

Methods:

- constructors (default and parametrized)
- setter methods
- getter methods
- toString(): *String (public)*

Tasks:

1. create users[] arrays of object with User class. Enter size of array using Scanner input;
2. generate object attributes with random vaules using static methods of Randomizer class;
3. print out users[] objects using toString() method;
4. change objects attributes current value using setter methods and check the changes using getter methods