JAVA PROGRAMMEREN – LES 3:

ARRAYS
COLLECTIES
LUSSEN
OVERERVING

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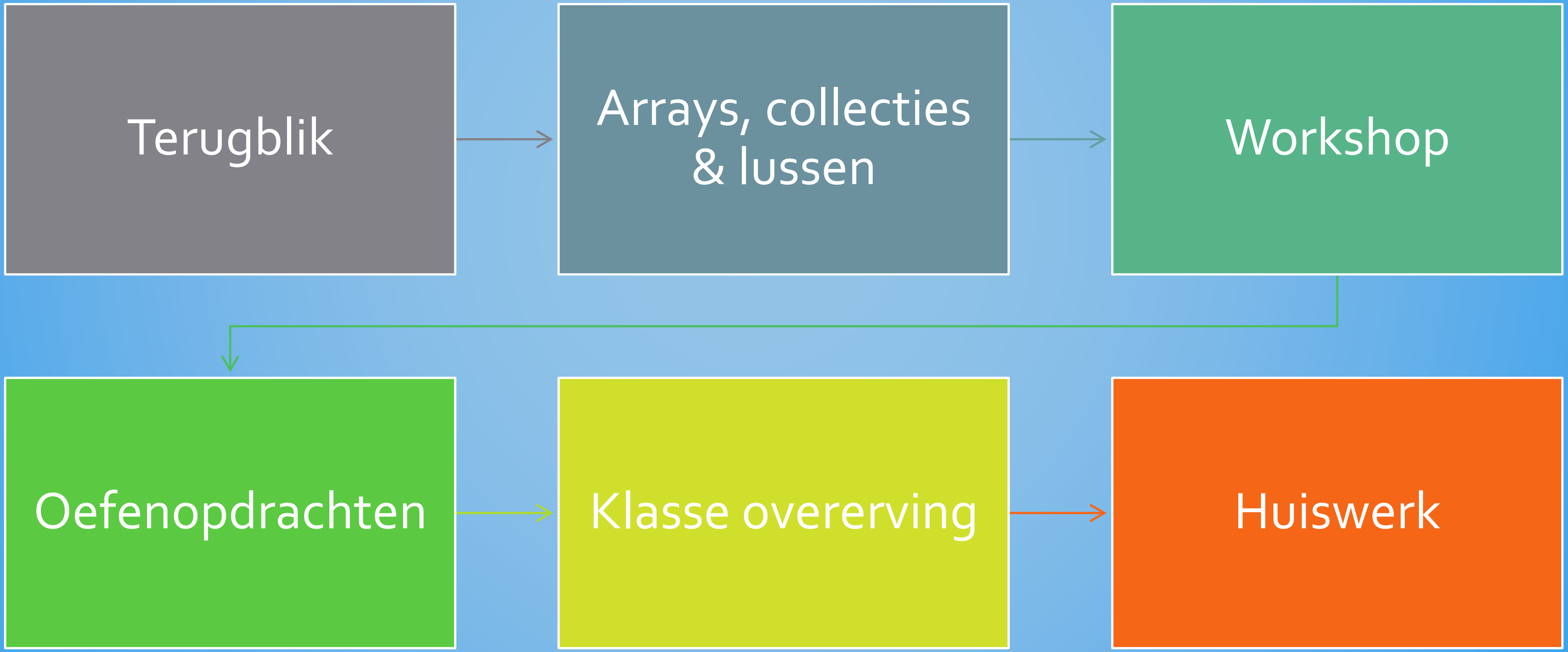
NOVI

AGENDA



Terugblik

Arrays, collecties & lussen

Workshop

Oefenopdrachten

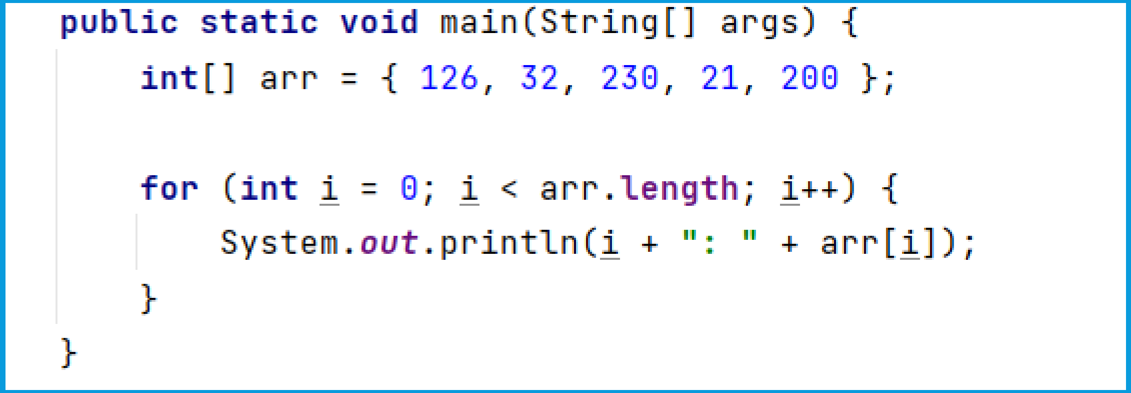
Klasse overerving

Huiswerk

TERUGBLIK

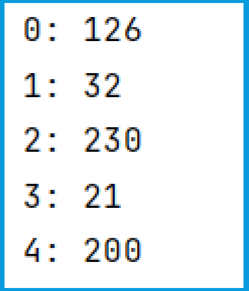
- Klassen & objecten
- Constructors
- Getters & setters
- Relaties tussen klassen

ARRAYS

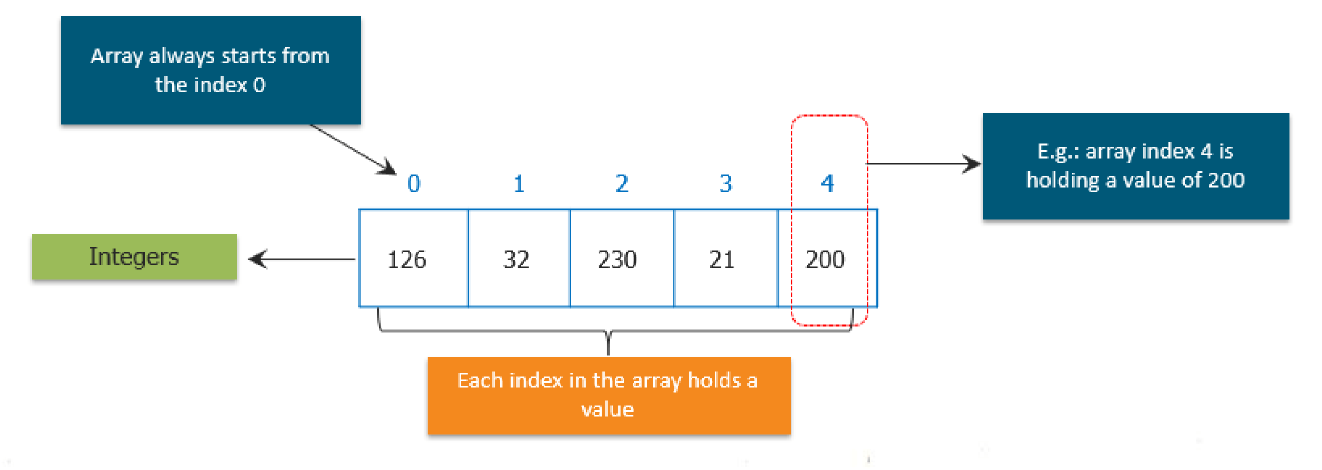


```java
public static void main(String[] args) {
    int[] arr = { 126, 32, 230, 21, 200 };

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



```
0: 126
1: 32
2: 230
3: 21
4: 200
```



Array always starts from the index 0

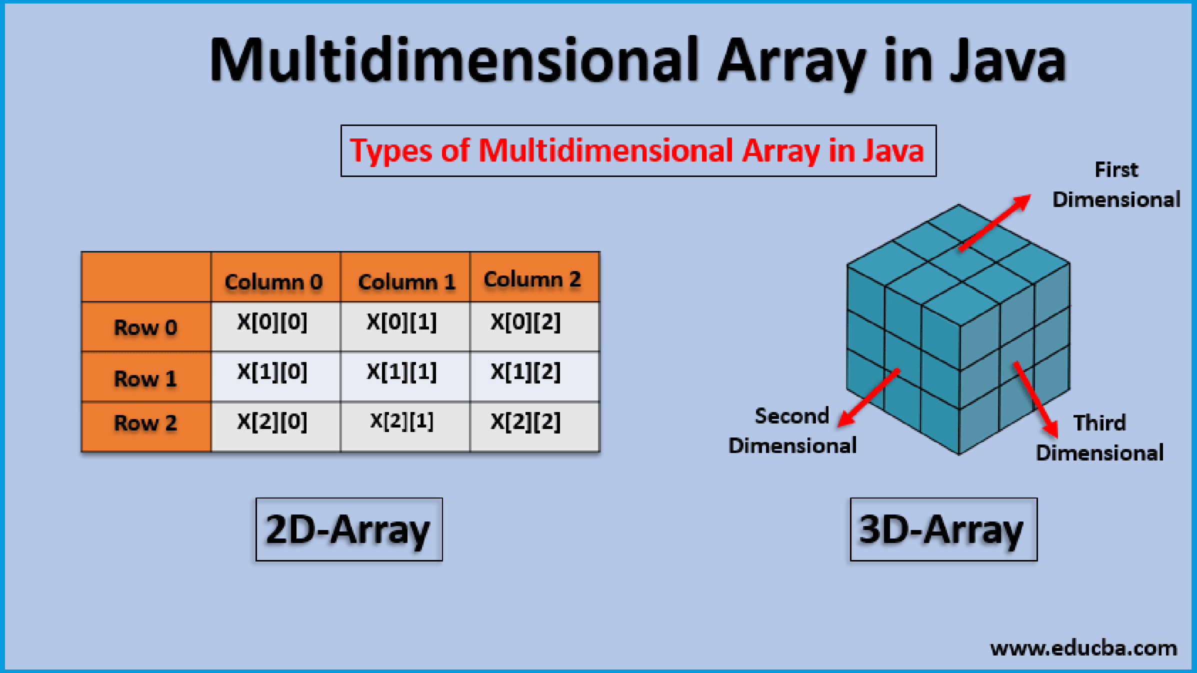
0	1	2	3	4
126	32	230	21	200

E.g.: array index 4 is holding a value of 200

Integers

Each index in the array holds a value

MULTIDIMENSIONAL ARRAYS



Multidimensional Array in Java

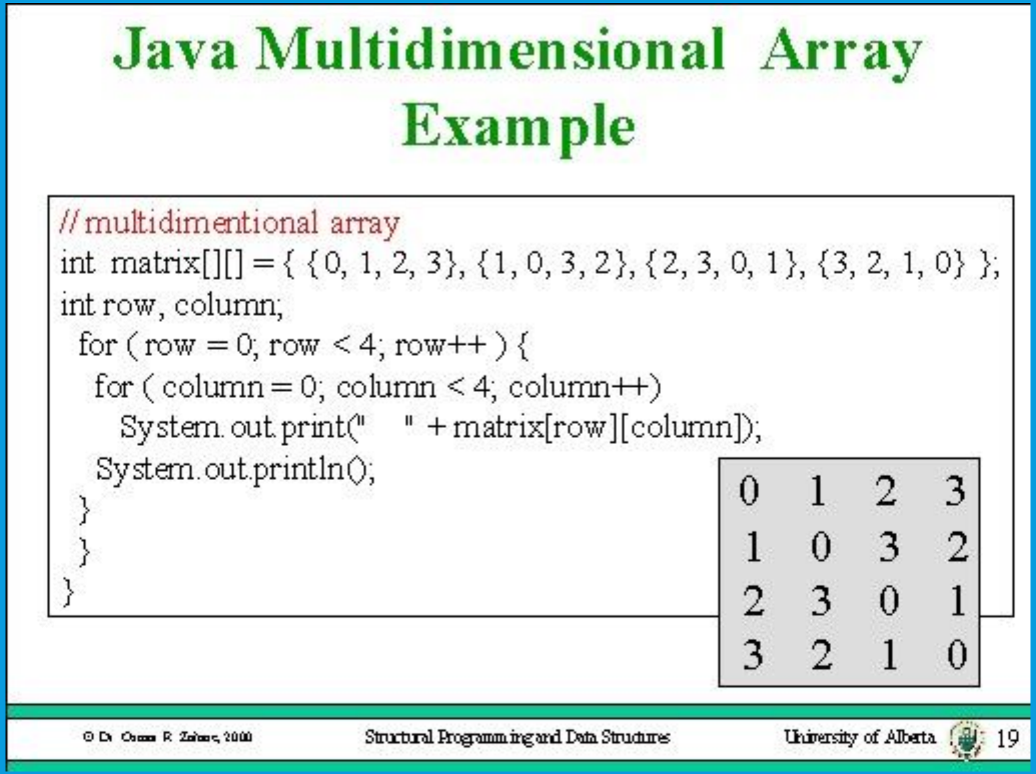
Types of Multidimensional Array in Java

	Column 0	Column 1	Column 2
Row 0	X[0][0]	X[0][1]	X[0][2]
Row 1	X[1][0]	X[1][1]	X[1][2]
Row 2	X[2][0]	X[2][1]	X[2][2]

2D-Array

3D-Array

www.educba.com



Java Multidimensional Array Example

```
//multidimentional array
int matrix[][] = { {0, 1, 2, 3}, {1, 0, 3, 2}, {2, 3, 0, 1}, {3, 2, 1, 0} };
int row, column;
 for ( row = 0; row < 4; row++ ) {
  for ( column = 0; column < 4; column++)
     System.out.print("    " + matrix[row][column]);
   System.out.println();
 }
 }
}
```

```
0  1  2  3
1  0  3  2
2  3  0  1
3  2  1  0
```

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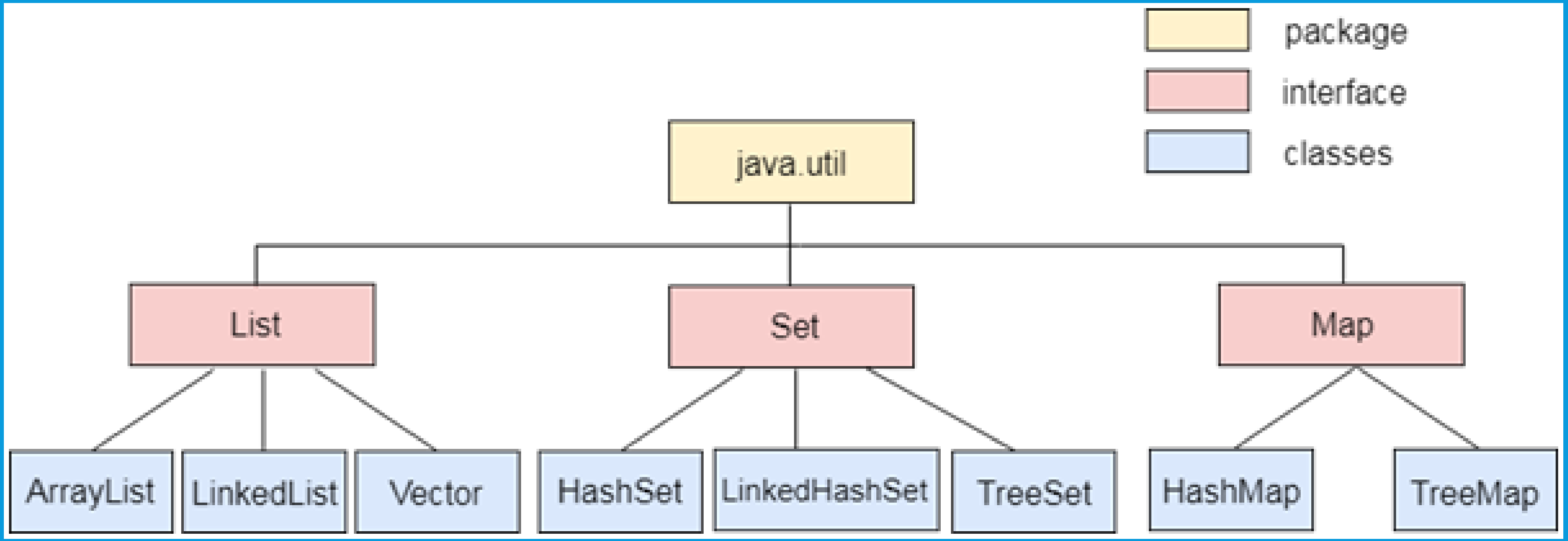
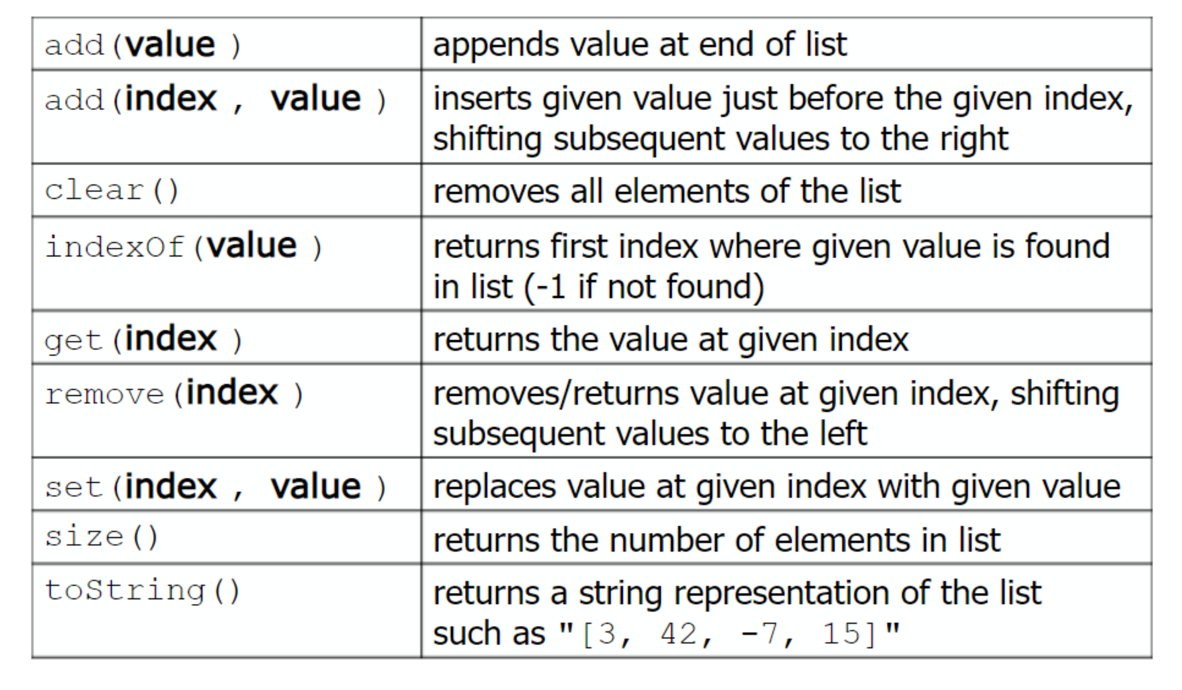
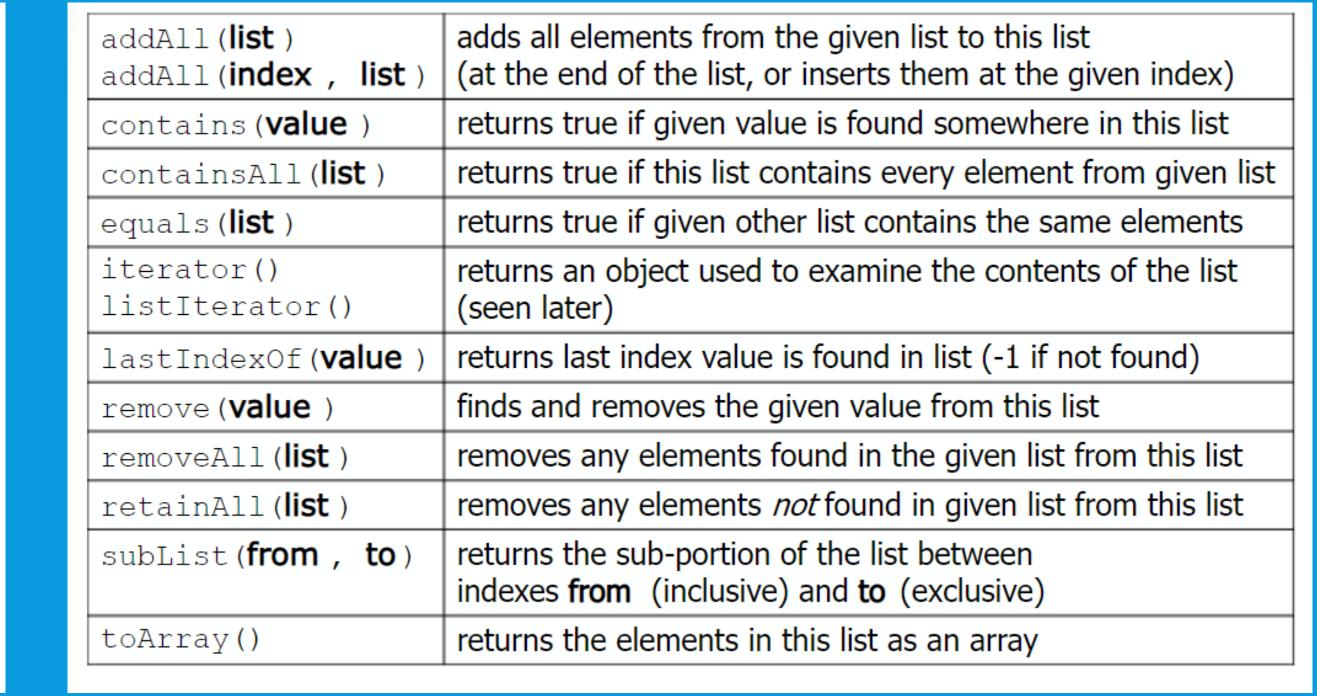
COLLECTIES


package
interface
classes
java.util
List
Set
Map
ArrayList
LinkedList
Vector
HashSet
LinkedHashSet
TreeSet
HashMap
TreeMap

ARRAYLIST METHODS



`add(`**value**`)`	appends value at end of list
`add(`**index**`,` **value**`)`	inserts given value just before the given index, shifting subsequent values to the right
`clear()`	removes all elements of the list
`indexOf(`**value**`)`	returns first index where given value is found in list (-1 if not found)
`get(`**index**`)`	returns the value at given index
`remove(`**index**`)`	removes/returns value at given index, shifting subsequent values to the left
`set(`**index**`,` **value**`)`	replaces value at given index with given value
`size()`	returns the number of elements in list
`toString()`	returns a string representation of the list such as `"[3, 42, -7, 15]"`

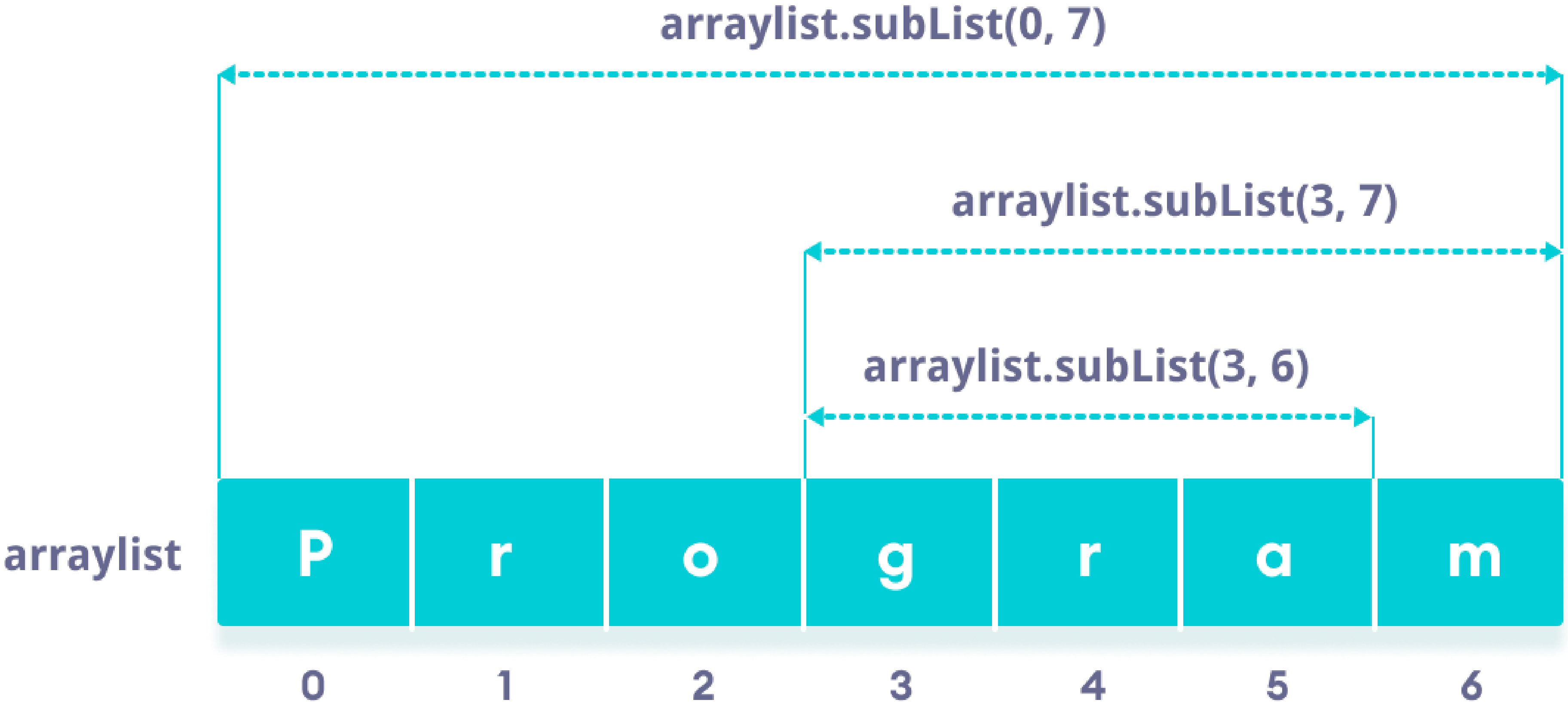


`addAll(`**list**`)`
`addAll(`**index**`,` **list**`)`
	adds all elements from the given list to this list (at the end of the list, or inserts them at the given index)

`contains(`**value**`)`	returns true if given value is found somewhere in this list
`containsAll(`**list**`)`	returns true if this list contains every element from given list
`equals(`**list**`)`	returns true if given other list contains the same elements

`iterator()`
`listIterator()`
	returns an object used to examine the contents of the list (seen later)

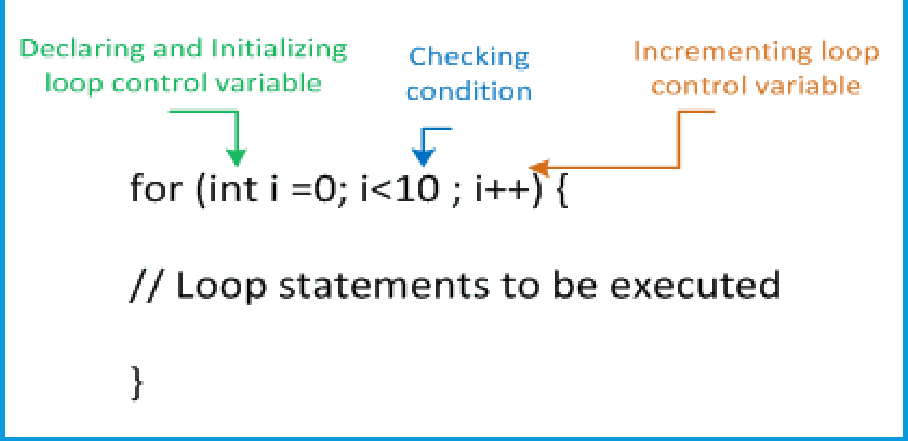
`lastIndexOf(`**value**`)`	returns last index value is found in list (-1 if not found)
`remove(`**value**`)`	finds and removes the given value from this list
`removeAll(`**list**`)`	removes any elements found in the given list from this list
`retainAll(`**list**`)`	removes any elements *not* found in given list from this list
`subList(`**from**`,` **to**`)`	returns the sub-portion of the list between indexes **from** (inclusive) and **to** (exclusive)
`toArray()`	returns the elements in this list as an array



ARRAYLIST SUBLIST

FOR LOOP

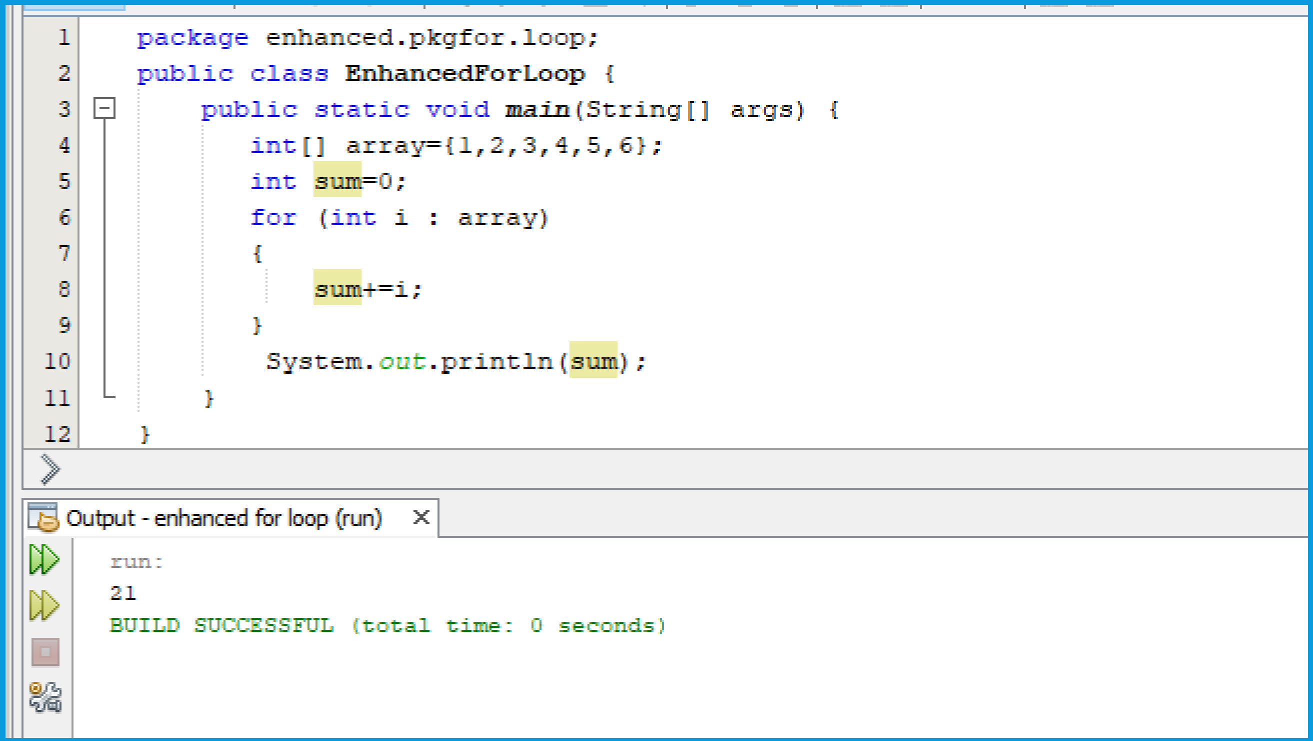
'normal'



Declaring and Initializing loop control variable
Checking condition
Incrementing loop control variable

```
for (int i =0; i<10 ; i++) {

// Loop statements to be executed

}
```

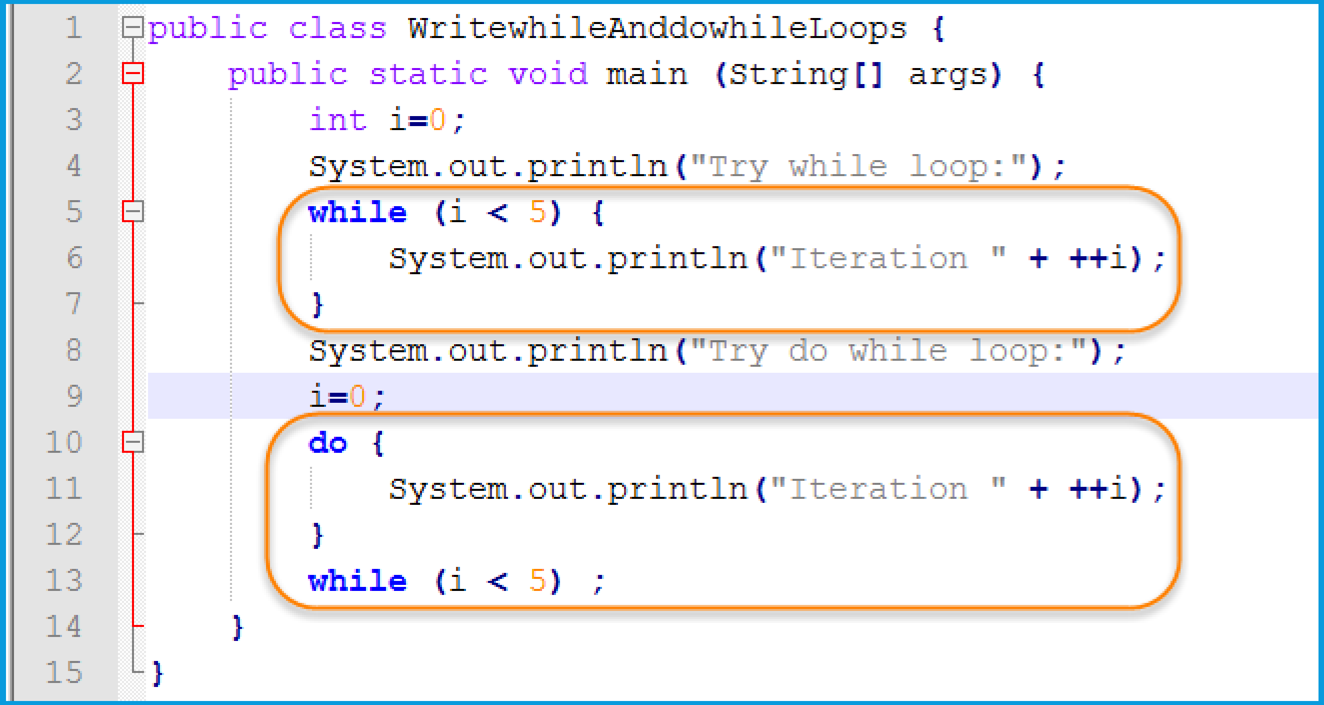
'enhanced'



```
package enhanced.pkgfor.loop;
public class EnhancedForLoop {
    public static void main(String[] args) {
        int[] array={1,2,3,4,5,6};
        int sum=0;
        for (int i : array)
        {
            sum+=i;
        }
         System.out.println(sum);
    }
}
```

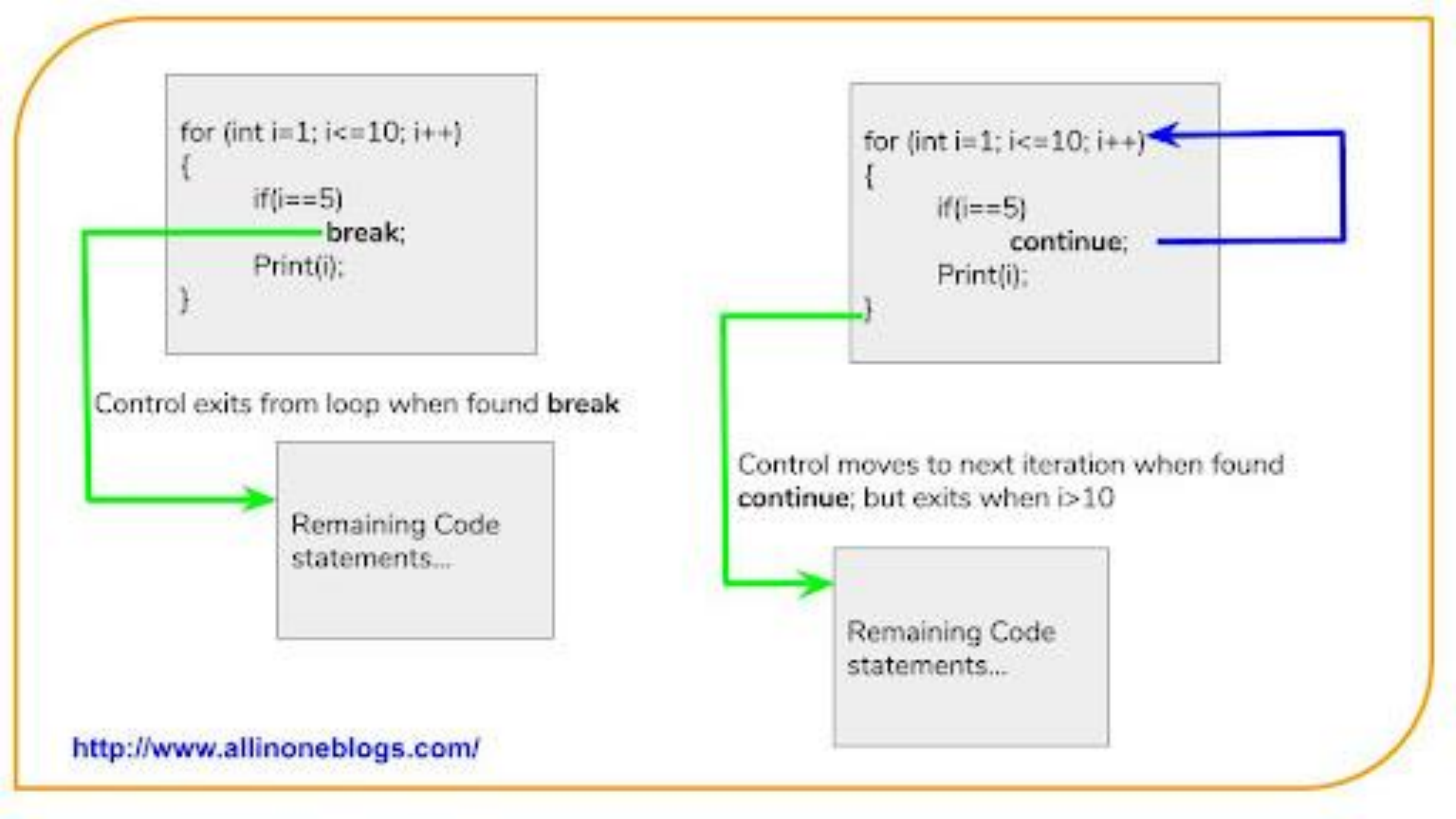
```
run:
21
BUILD SUCCESSFUL (total time: 0 seconds)
```

WHILE LOOP



```
public class WritewhileAnddowhileLoops {
    public static void main (String[] args) {
        int i=0;
        System.out.println("Try while loop:");
        while (i < 5) {
            System.out.println("Iteration " + ++i);
        }
        System.out.println("Try do while loop:");
        i=0;
        do {
            System.out.println("Iteration " + ++i);
        }
        while (i < 5) ;
    }
}
```

BREAK & CONTINUE



```
for (int i=1; i<=10; i++)
{
        if(i==5)
                break;
        Print(i);
}
```

Control exits from loop when found **break**

Remaining Code statements...

```
for (int i=1; i<=10; i++)
{
        if(i==5)
                continue;
        Print(i);
}
```

Control moves to next iteration when found **continue**; but exits when i>10

Remaining Code statements...

http://www.allinoneblogs.com/

WORKSHOP

ArrayList loop (3 ways)

Boter, kaas en eieren

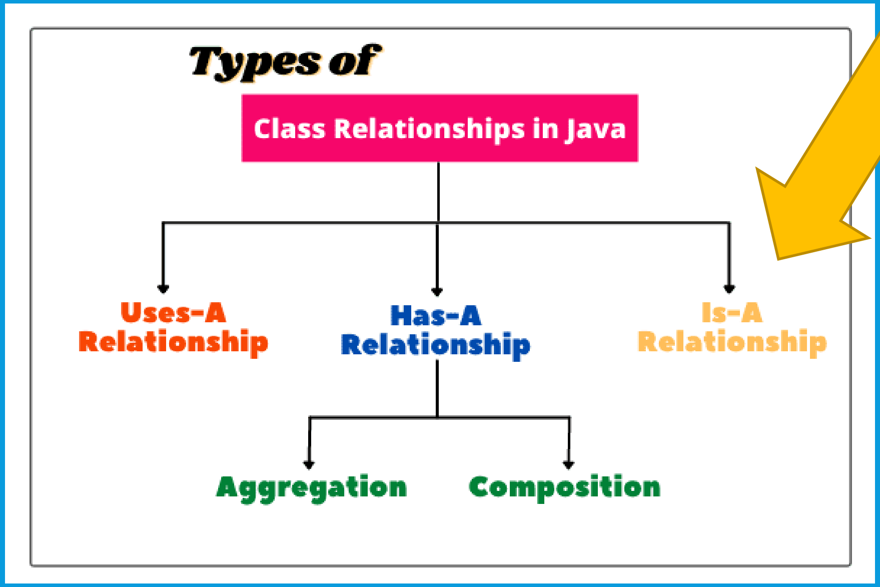
OEFENOPDRACHTEN

https://github.com/hogeschoolnovi/SD-BE-JP-oefenopdrachten/tree/master/src/nl/novi/opdrachten

Lees readme.md voor moeilijkheid. Maak 1 oefening per categorie (dus totaal 4)

- Beslissingsstructuren
- Lijsten
- Methoden
- While-lussen

KLASSE OVERERVING



Types of

Class Relationships in Java

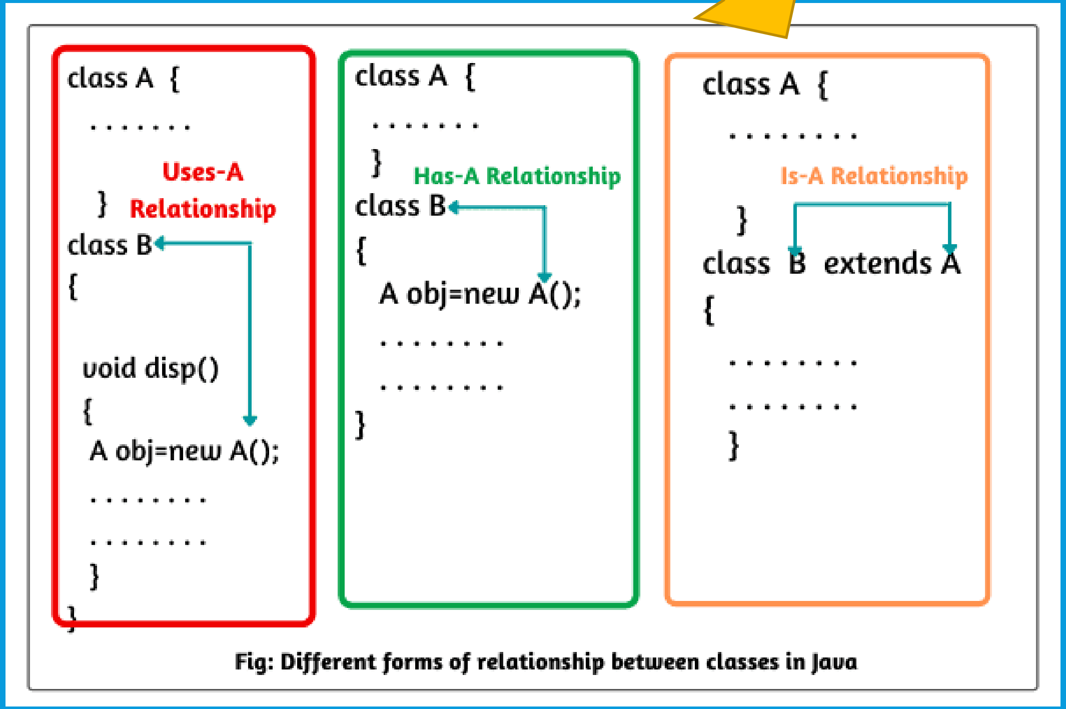
Uses-A Relationship

Has-A Relationship

Is-A Relationship

Aggregation

Composition



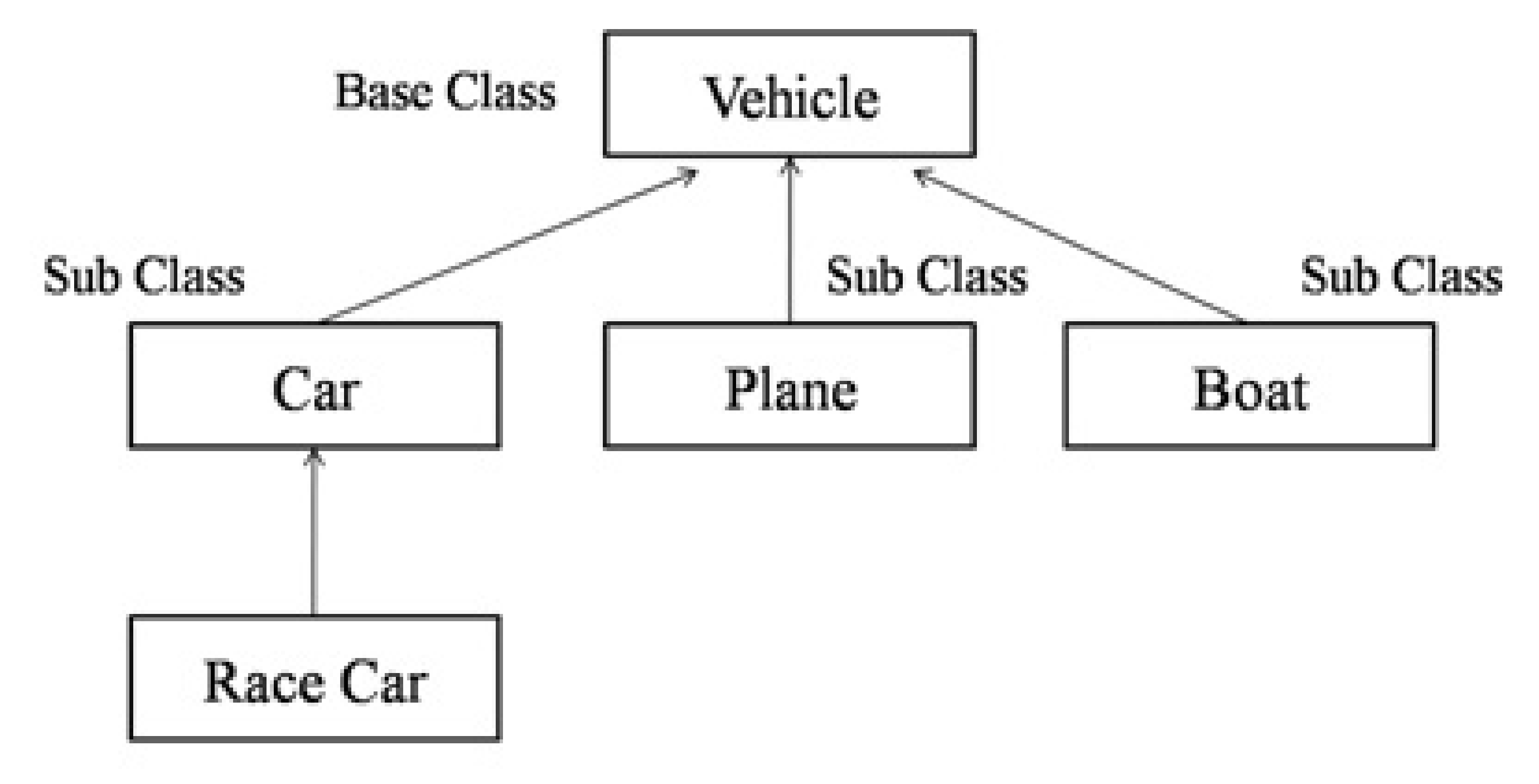
```
class A {
  .......
        Uses-A
  }  Relationship
class B
{

 void disp()
 {
  A obj=new A();
  ........
  ........
 }
}
```

```
class A {
  .......
 }  Has-A Relationship
class B
{
  A obj=new A();
  ........
  ........
}
```

```
class A {
   ........
      Is-A Relationship
  }
class B extends A
{
   ........
   ........
  }
```

Fig: Different forms of relationship between classes in Java

KLASSE OVERERVING



OPDRACHT ‘KLASSE OVERERVING’

- Werk in tweetallen

- Kies een onderwerp voor een klasse structuur

- Uit welke klassen bestaat de structuur? Maak een schets.

- Welke velden horen bij welke klassen?

HUISWERK

- Maak nog (minstens) 4 oefenopgaven uit SD-BE-JP-oefenopdrachten

- Bestudeer Java Programmeren EdHub:
  - Hoofdstuk 3.1 t/m 3.4 : Relaties
  - Hoofdstuk 4.1 t/m 4.7 : Overerven