



Review of ArrayList and ArrayUtil

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How to create an array list?

Create an ArrayList of String

```
ArrayList<_____> pets =  
    _____;
```

"Depend on Interfaces"

You can also declare pets as "List"

```
List<String> pets =  
    new ArrayList<String>( );
```

An **interface** in Java is a **specification** for **behavior**.

Many classes can "implement" the interface.

USB is an "interface" for behavior of USB devices.

Any company can create real devices that "implement" the USB interface ... they all provide same behavior.

Create an ArrayList of Date

Java has a class named Date. Create arraylist of Date.

```
ArrayList<_____> appointments =  
    _____;
```

Add some pets

Add "Meow" and "Nok" to the ArrayList

```
List<String> pets = new ArrayList<>( );
```

```
// add Meow and Nok to list
```

```
_____ . _____ ;
```

```
_____ . _____ ;
```

How many pets?

How many pets in the list?

```
// getMyPets() returns ArrayList of pets
List<String> pets = getMyPets( );

int number = _____;

if (number > 10)
    System.out.println("too many pets!");
```

Where is Meow?

Get the index of Meow in the list.

```
List<String> pets = getMyPets ( );  
  
int index = _____;  
if (index < 0)  
    System.out.println("Can't find Meow!");
```

Is there a pet named "Moo"?

How to test for a string ("Moo") in a list?

```
List<String> pets = getMyPets ( );
```

```
String name = "Moo";
```

```
if ( _____ )
```

```
    System.out.println("List contains"+name);
```


Remove "Moo" from the list (2 ways)

How to delete "Moo" from the list?

```
List<String> pets = getMyPets ( );
```

```
String name = "Moo";
```

```
// delete "Moo" from the list (2 ways)
```

```
_____;
```

Remove "Moo" from the list (2nd way)

How to delete "Moo" from the list?

```
List<String> pets = getMyPets ( );  
String name = "Moo";  
  
// delete "Moo" from the list (2 ways)  
_____;
```

Remove "Moo" from the list (sol'n)

How to delete "Moo" from the list?

```
List<String> pets = getMyPets ( );  
String name = "Moo";  
// delete "Moo" from the list (3 ways)  
pets.remove( name );  
pets.removeAll( name );  
int k = pets.indexOf( name );  
if (k >= 0) pets.remove(k);
```

What's Wrong?

```
/** Reverse elements in an array. */  
static void reverse(String[] array) {  
    String[] rev = new String[array.length];  
    int last = array.length - 1;  
    for(int k=0; k<array.length; k++)  
        rev[k] = array[last - k];  
    array = rev;  
}
```

```
String[] food = { "apple", "banana", "grape" };  
reverse(food);  
System.out.println( food[0] ); // apple
```

But this works...

```
/** Reverse elements in an array. */
static void reverse(String[] array) {
    int last = array.length - 1;
    for(int k=0; k<array.length/2; k++) {
        String temp = a[k];
        a[k] = a[last-k];
        a[last-k] = temp;
    }
}
```

```
String[] food = { "apple", "banana", "grape" };
reverse(food);
System.out.println( food[0] ); // grape
```

Can You Explain Why?

Why the first reverse code does not change caller's array,
but second reverse works?

What is printed now?

```
static String[] s;  
public static void main(String[] args) {  
    s = new String[10];  
    System.out.println( s[1] );  
}
```

Make Food

Suppose you have a class named `Food`.

Write one statement to create an array of 20 `Food`s.

```
_____ = _____ ;
```


How to copy an array?

Copy array `a[]` to array `b[]`. What is wrong with this?

```
double[] a = { 1.0, 2.0, 3.0, 4.0 };  
double[] b = new double[4];  
  
b = a;  
  
System.out.println( Arrays.toString(b) );  
  
// Prints:  
  
[1.0, 2.0, 3.0, 4.0]
```

How to really copy an array?

Write the code to copy a into b.

```
double[] a = { 1.0, 2.0, 3.0, 4.0 };  
double[] b = new double[a.length];  
  
//TODO Copy array a to array b
```

Name that Package...

What is the name of the Java package:

_____ contains **core classes of the Java language**, such as Object, Double, String, System.

_____ contains utility class, Collections, and older Date classes. Ex: Scanner, ArrayList.

_____ contains classes for input and output, such as InputStream and OutputStream.

Bonus:

_____ contains newer Date & Time classes, such as LocalDate (*remember?*).

Did you get all 4 Packages?

The most commonly used packages in Java:

`java.lang`

`java.io`

`java.util`

Newer and very useful:

`java.nio`

`java.time`

*Install the Java API Docs
(Javadoc) on your computer,
and get familiar with these.*

It pays to be curious.

How to Compile

1. What is the command to **compile** Food.java?

```
cmd>
```

2. What is the command to check **which version** of Java is installed (very useful to know)?

```
cmd>
```