**AP CS A – Week 10 Exercises**

**Exercise 57: Words**

Create a program that asks the user to input words until the user types in an empty String. Then the program prints the words the user gave. Try the for repetition sentence here. Use an ArrayList structure in your program. ArrayList is defined like this:

ArrayList<String> words = **new** ArrayList<String>();

Type a word: Mozart

Type a word: Schubert

Type a word: Bach

Type a word: Sibelius

Type a word: Liszt

Type a word:

You typed the following words:

Mozart

Schubert

Bach

Sibelius

Liszt

**Note:** an empty String can be detected this way:

String word = reader.**nextLine**();

**if** ( word.**isEmpty**() ) { *// could also be: word.equals("")*

*// word was empty, meaning that the user only pressed enter*

}

**Exercise 59: Words in reverse order**

Create a program that asks the user to input words, until the user gives an empty string. Then the program prints the words the user gave in reversed order, the last word is printed first etc.

Type a word: Mozart

Type a word: Schubert

Type a word: Bach

Type a word: Sibelius

Type a word: Liszt

Type a word:

You typed the following words:

Liszt

Sibelius

Bach

Schubert

Mozart

**Exercise 61: Amount of items in a list**

Create the method public static int countItems(ArrayList<String> list) that returns the number of the items in the list. Your method should not print anything. Use a return statement to return the number as shown in the following example:

ArrayList<String> list = **new** ArrayList<String>();

list.**add**("Hallo");

list.**add**("Ciao");

list.**add**("Hello");

System.out.**println**("There are this many items in the list:");

System.out.**println**(**countItems**(list));

There are this many items in the list:

3

Inside the method, it is possible to influence the items in the parameter list. In the following example, the method removeFirst --as the name suggests-- removes the first string from the list. What would happen if the list was empty?

**public** **static** void **print**(ArrayList<String> printed) {

**for** (String word : printed) {

System.out.**println**( word );

}

}

**public** **static** void **removeFirst**(ArrayList<String> list) {

list.**remove**(0); *// removes the first item (indexed 0)*

}

**public** **static** void **main**(String[] args) {

ArrayList<String> programmingLanguages = **new** ArrayList<String>();

programmingLanguages.**add**("Pascal");

programmingLanguages.**add**("Java");

programmingLanguages.**add**("Python");

programmingLanguages.**add**("Ruby");

programmingLanguages.**add**("C++");

**print**(programmingLanguages);

**removeFirst**(programmingLanguages);

System.out.**println**(); *// prints an empty line*

**print**(programmingLanguages);

}

Output:

Pascal

Java

Python

Ruby

C++

Java

Python

Ruby

C++

Similarly a method could, for example, add more strings to the list it received as a parameter.

**Exercise 63: Sum of the numbers**

Create the method sum, which receives a list of numbers (ArrayList<Integer>) as a parameter and then calculates the sum of the items in that list.

Create the method using the following program body:

**public** **static** int **sum**(ArrayList<Integer> list) {

*// write your code here*

}

**public** **static** void **main**(String[] args) {

ArrayList<Integer> list = **new** ArrayList<Integer>();

list.**add**(3);

list.**add**(2);

list.**add**(7);

list.**add**(2);

System.out.**println**("The sum: " + **sum**(list));

list.**add**(10);

System.out.**println**("the sum: " + **sum**(list));

}

Program output:

The sum: 14

The sum: 24

**Exercise 64: Average of numbers (BONUS)**

Create the method average, which receives a list of numbers (ArrayList<Integer>) as a parameter and then calculates the average of the items in that list.

**Note:** the method should use the method sum from the previous exercise to calculate the sum of the parameters.

Create the method using the following program body:

**public** **static** double **average**(ArrayList<Integer> list) {

*// write your code here*

}

**public** **static** void **main**(String[] args) {

ArrayList<Integer> list = **new** ArrayList<Integer>();

list.**add**(3);

list.**add**(2);

list.**add**(7);

list.**add**(2);

System.out.**println**("The average is: " + **average**(list));

}

Program output:

The average is: 3.5