

## JAVA Exercises – 17-11-2023

### PROGRAMMING EXERCISES

21.1 (Generic Pair class) Write a generic class `Pair<T1, T2>` representing pairs of objects of two (possibly) different types, for example `(5, "rat")` or `(2.25E6, false)`. Include the methods `getFirst()` to return the first element of the pair, and `getSecond()` to return the second. Make objects of this class immutable, and also include a nice overriding of `toString()`.

21.2 (Generic binary search) Implement the following method using binary search.

```
public static <E extends Comparable<E>>  
int binarySearch(E[] list, E key)
```

21.3 (Generic selection sort) Implement the following method using selection sort.

```
public static <E extends Comparable<E>>  
void selectionSort(E[] list)
```

21.4 (Generic insertion sort) Implement the following method using insertion sort.

```
public static <E extends Comparable<E>>  
void selectionSort(E[] list)
```

21.5 (Maximum element in an array) Implement the following method that returns the maximum element in an array.

```
public static <E extends Comparable<E>> E max(E[] list)
```

21.6 (Maximum row sum) Write a generic method that finds the row in a two dimensional array with the maximum sum, and returns that sum:

```
public static <E extends Number> double maxRowSum(E[][] array)
```