Verification-Driven Program Development
Exercise Sheet, Week 4

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20.10.2025

Exercises

1. Implement a method that checks whether an array of `int`s contains duplicates, using a pair of nested `for` loops.

   Specify and verify the method.

2. Implement insertion sort:

   (a) implemented a method to swap two elements in an array.

   (b) implement a method `insert` that takes an array of integers, a position `n` into the array, assumes the range between `0` and `n - 1` is sorted, and inserts the element at position `n` into the right place;

   (c) implement a method `insertSort` to sort an array by repeated calls to `insert`.

   Specify and verify the three methods.

3. Implement a method `unique` that computes the unique values in an array (returns a new array, quadratic complexity).

   Specify and verify the method.

4. Implement a method `compact` that takes a sorted array as input and removes the duplicates (in linear time).

   Specify and verify the method.