Portfolio Exercise 4 (Deadline 1/12/2014 at 12:00)

We are given an array that contains N numbers and would like to determine if there are two numbers whose sum equals a given number K.

For example we may be given the sequence 4,1,5,2,6,3 and are asked to find a pair of numbers with a sum of 10. In this example 4 and 6 is a valid result.

To solve the portfolio do the following:

1) Implement an $O(N^2)$ algorithm for solving the problem
2) Implement an O(N Log(N)) algorithm for solving the problem (Hint: Consider sorting the list)
3) Perform experiments with different values of N (generate the associated random lists yourselves) and plot the time as function of N, to verify the time complexity.

You may use a build in sorting algorithm and assume that it sorts in N Log(N).

Hand-in:

- A report explaining the algorithms you have selected for 1) and 2)
- Plots of the time as function of N as well as a discussion of the results
- The source code (either as source files or in an appendix of the report)

Deadline:

- 1/12/2014 at 14:00
- Use the SDU Assignment functionality of black board to hand in the exercise.