TECHNISCHE UNIVERSITÄT
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Department of Computer Science
AG Algorithms and Complexity

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2nd Hands-on sheet for Advanced Algorithmics, SS 15

Hand In: *in lecture, exercise sessions, hand-in box in stairwell 48-6 or via email.*

Step 3: Is it hard?

As a first approach, let us try the simplest algorithms possible and look at the performance.

1. Implement brute-force algorithms for the scenarios.
2. Develop a test suite. It should contain (classes of) inputs suitable for validation, i. e. testing your algorithms for correctness, as well as performance benchmarks.
3. Run your implementations against the test suites. What do you observe? What can you say about different performance metrics? Can you estimate asymptotic runtime?
4. Which of the real-world data sets can you already deal with?

Step 4.1: Find better algorithms – fixed parameters and kernels

Try to apply the new concepts from lecture to our scenarios.

- Research fixed-parameter complexities and algorithms as well as kernelisation strategies for the problems we model our scenarios with.

  Are they comparable, that is are some always better than others, or do they have trade-offs? Do they depend on the form of the data? If so, which are most suitable for our scenarios?

- Implement the most promising candidates and run them against your testbed. What do you observe in terms of performance?
- Run the algorithms on our real-world data. How do they perform? Can you explain differences in performance?