

# Advanced Algorithms in Bioinformatics (P4)

## Sequence and Structure Analysis

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4. Exercise sheet, 10. May 2009

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### *Exercise 1.*

Familiarize yourself with the algorithmic strategies of the Quasar and Swift algorithm

### *Exercise 2.*

Work out the details of an algorithm to generate an index for gapped Q-grams. Access to the list of occurrences should be  $O(1)$ .

### *Exercise 3.*

1. Is the q-gram Lemma also valid for gapped shapes and is it tight?
2. Justify your answer with an example.