# Numbered Heading 1

## numbered Heading 2

### numbered Heading 3

#### numbered Heading 4

Body text in font Garamond 12pt

<https://www.duo.uio.no/bitstream/handle/10852/37680/Bragstad.pdf?sequence=5>

<https://www.duo.uio.no/bitstream/handle/10852/37431/Furenes_Master.pdf?sequence=1>

Tom side

Title for master thesis

Sabba Ifzal

May 1, 2014

Tom side

Acknowledgements

Takke folk som har hjulpet til

Veiledere – Torbjørn, Lex, Geir Kjetil og Ksenia

Andre folk i 10 – Sveinung, Kai, Jon

Ruth for sensur

Ghada for samtaler

etc

Abstract

Kort oppsummert hele oppgaven

Preface

Hvem er oppgaven ment for? Andre bioinformatikkstudenter

Contents

[Chapter 1 Numbered Heading 1 1](#_Toc377385015)

[1.1 numbered Heading 2 1](#_Toc377385016)

[1.1.1 numbered Heading 3 1](#_Toc377385017)

[Acknowledgements 5](#_Toc377385018)

[Abstract 6](#_Toc377385019)

[Preface 8](#_Toc377385020)

[Contents 10](#_Toc377385021)

[List of figures 12](#_Toc377385022)

[List of tables 13](#_Toc377385023)

[Chapter 2 Introduction 14](#_Toc377385024)

[2.1 Motivation 14](#_Toc377385025)

[2.2 Hypothesis? 14](#_Toc377385026)

[Chapter 3 Background 15](#_Toc377385027)

[3.1 DNA and RNA 15](#_Toc377385028)

[3.2 Sequencing 15](#_Toc377385029)

[3.2.1 De novo sequencing 15](#_Toc377385030)

[3.2.2 Next generation sequencing 15](#_Toc377385031)

[3.3 Genome Assembly 15](#_Toc377385032)

[3.3.1 Quality measures 15](#_Toc377385033)

[3.3.2 Quast 15](#_Toc377385034)

[3.4 Bioinformatics 15](#_Toc377385035)

[3.4.1 Benchmarking 16](#_Toc377385036)

[3.5 Problem areas 16](#_Toc377385037)

[3.5.1 Assembly 16](#_Toc377385038)

[3.5.2 GAGE-B 16](#_Toc377385039)

[3.5.3 Galaxy framework 16](#_Toc377385040)

[3.6 Technology and formats 16](#_Toc377385041)

[3.6.1 Python 16](#_Toc377385042)

[3.6.2 Bash 16](#_Toc377385043)

[3.6.3 Galaxy 16](#_Toc377385044)

[3.6.4 All assembler 16](#_Toc377385045)

[3.6.5 Fasta and fastq 16](#_Toc377385046)

[3.7 Evaluation methods 16](#_Toc377385047)

[Chapter 4 Material 17](#_Toc377385048)

[4.1 Dataset 17](#_Toc377385049)

[4.2 Reference genome 17](#_Toc377385050)

[4.3 Assemblers? 17](#_Toc377385051)

[Chapter 5 Methods 18](#_Toc377385052)

[5.1 Description 18](#_Toc377385053)

[5.2 Implementation 18](#_Toc377385054)

[Chapter 6 Results 19](#_Toc377385055)

[Chapter 7 Discussion 20](#_Toc377385056)

[7.1 Interpreting the results 20](#_Toc377385057)

[7.2 Analysis of galaxy tool 20](#_Toc377385058)

[7.2.1 Performance 20](#_Toc377385059)

[7.2.2 Potential use 20](#_Toc377385060)

[7.2.3 Weakness 20](#_Toc377385061)

[7.3 Further work 20](#_Toc377385062)

[7.4 Conclusion 20](#_Toc377385063)

[Appendix a (Plot/Figure) 21](#_Toc377385064)

[Appendix B (Tables) 22](#_Toc377385065)

List of figures

[figure 1 21](#_Toc377132394)

[Table 7-1 Bla bla bla 21](#_Toc377132395)

List of tables

[figure 1 21](#_Toc377132379)

[Table 7-1 Bla bla bla 21](#_Toc377132380)

# Introduction

## Motivation

## Hypothesis?

# Background

## DNA and RNA

## Sequencing

#### Reads

#### Coverage

#### Contig

#### Scaffolds

### De novo sequencing

### Next generation sequencing

## Genome Assembly

### Quality measures

### Quast

## Bioinformatics

### Benchmarking

## Problem areas

### Assembly

### GAGE-B

### Galaxy framework

## Technology and formats

### Python

### Bash

### Galaxy

### All assembler

### Fasta and fastq

## Evaluation methods

# Material

All dataset used in the application here

## Dataset

## Reference genome

## Assemblers?

## GAGE-B

Hentet data, jobbet med gage-b data først, men møtte på følgende problemer

# Methods

This chapter covers a description of the tool and implementation.

## Description

## Implementation

## Galaxy tutorial

Jeg har møtt på en del utfordringer I forbindelse med galaxy, her er noen av tingene som andre kan ha nytte av.

# Results

With different parameters

# Discussion

## Interpreting the results

## Analysis of galaxy tool

### Performance

### Potential use

### Weakness

## Further work

## Conclusion

Appendix a  
(Plot/Figure)



figure

Appendix B  
(Tables)

|  |  |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Table - Bla bla bla