

PROJECT BLOCK 1.3

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# Find the smallest range for the chromatic number of a graph

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GROUP 10

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Summited: Wednesday January 23, 2019

MAASTRICHT UNIVERSITY

DEPARTMENT OF DATA SCIENCE AND KNOWLEDGE  
ENGINEERING

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# Summary

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Preface

Summary

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# Abbreviations and symbols

## Chapter 1

# Introduction

# Chapter 2

## Methods

### 2.1 Decomposing the graph

Seperate the disconnected graphs in the original graph  
Use breadth-first search

### 2.2 Greedy algorithm

Sort the vertices based on their constraints  
Try to reuse available colors.

### 2.3 Special cases

#### 2.3.1 Bipartite

Use breadth-first search

#### 2.3.2 Odd cycle

#### 2.3.3 Complete graph

Check if every vertex is connected to all other vertices

### 2.4 Genetic algorithm

#### 2.4.1 Fitness function

Based on the number of invalid coloring of each graph



**2.4.2 Selection method**

**2.4.3 Crossover**

**2.4.4 Mutation**

**2.5 Brute force search**

## Chapter 3

# Experiments

## Chapter 4

# Results

## Chapter 5

# Discussion

## Chapter 6

# Conclusion

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