2MA918 Laboration I

Samuel Berg (sb224sc)

November 2025

Contents

1 Exercise 1: Warm-up LP-problem

i) Define the model

ii) Restricted convex set region

iii) Study the figure of ii)

iv) Adding level curves to convex hull plot

v) Verify in all extreme points

vi) Find the maximum

vii) Problem in *standard form*

2 Exercise 2: Large LP-problems

i) Matrix and vectors solution, why?

ii) Solving example with simplex

iii) Get simplex average time exceeds 1 second

iv) Replace simplex with more sophisticated method

3 Exercise 3: Sensitivity analysis

i) Solve the dual problem and verify

ii) Shadow price of various constraints

iii) 100 extra working hours

iv) Price increase to change optimal solution

v) New TV, should be produced or not?

vi) Quality inspection working time increase