

2MA918 Laboration I

Samuel Berg (sb224sc)

November 2025

Contents

1 Exercise 1: Warm-up LP-problem	2
i) Define the model	2
ii) Restricted convex set region	2
iii) Study the figure of ii)	2
iv) Adding level curves to convex hull plot	2
v) Verify in all extreme points	2
vi) Find the maximum	2
vii) Problem in <i>standard form</i>	2
2 Exercise 2: Large LP-problems	3
i) Matrix and vectors solution, why?	3
ii) Solving example with simplex	3
iii) Get simplex average time exceeds 1 second	3
iv) Replace simplex with more sophisticated method	3
3 Exercise 3: Sensitivity analysis	4
i) Solve the dual problem and verify	4
ii) Shadow price of various constraints	4
iii) 100 extra working hours	4
iv) Price increase to change optimal solution	4
v) New TV, should be produced or not?	4
vi) Quality inspection working time increase	4

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