# >> Ex\_1

LP: Optimal objective value is -26666.666667.

Heuristics: Found 1 solution using ZI round.

Upper bound is -26200.000000.

Relative gap is 1.53%.

Cut Generation: Applied 1 Gomory cut.

Lower bound is -26600.000000.

Relative gap is 0.00%.

Optimal solution found.

Intlinprog stopped at the root node because the objective value is within a gap tolerance of

the optimal value, options.AbsoluteGapTolerance = 0. The intcon variables are

integer within tolerance, options.IntegerTolerance = 1e-05.

Optimal value of number of ceramics: 52

Optimal value of number of copper: 27

The max profit in euros is : 26600

# >> Ex\_1\_CVX

Calling SDPT3 4.0: 5 variables, 2 equality constraints

For improved efficiency, SDPT3 is solving the dual problem.

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num. of constraints = 2

dim. of linear var = 5

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SDPT3: Infeasible path-following algorithms

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version predcorr gam expon scale\_data

NT 1 0.000 1 0

it pstep dstep pinfeas dinfeas gap prim-obj dual-obj cputime

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0|0.000|0.000|5.3e-01|1.7e+00|2.3e+05| 6.770920e+04 0.000000e+00| 0:0:00| chol 1 1

1|1.000|1.000|4.9e-07|3.7e-03|2.4e+04| 4.616071e+04 2.203661e+04| 0:0:00| chol 1 1

2|0.879|1.000|9.1e-08|3.7e-04|2.7e+03| 2.759952e+04 2.486743e+04| 0:0:00| chol 1 1

3|1.000|0.730|8.2e-07|1.3e-04|1.3e+03| 2.775178e+04 2.643906e+04| 0:0:00| chol 1 1

4|0.978|0.828|2.8e-08|2.5e-05|6.9e+01| 2.670983e+04 2.664106e+04| 0:0:00| chol 1 1

5|0.974|0.979|7.2e-10|8.9e-07|2.2e+00| 2.666801e+04 2.666581e+04| 0:0:00| chol 1 1

6|0.989|0.989|7.8e-11|1.0e-08|2.5e-02| 2.666668e+04 2.666666e+04| 0:0:00| chol 1 1

7|0.989|0.989|1.3e-12|1.3e-10|2.8e-04| 2.666667e+04 2.666667e+04| 0:0:00|

stop: max(relative gap, infeasibilities) < 1.49e-08

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number of iterations = 7

primal objective value = 2.66666668e+04

dual objective value = 2.66666666e+04

gap := trace(XZ) = 2.79e-04

relative gap = 5.23e-09

actual relative gap = 5.19e-09

rel. primal infeas (scaled problem) = 1.28e-12

rel. dual " " " = 1.30e-10

rel. primal infeas (unscaled problem) = 0.00e+00

rel. dual " " " = 0.00e+00

norm(X), norm(y), norm(Z) = 1.5e+02, 6.0e+01, 6.0e+01

norm(A), norm(b), norm(C) = 5.8e+00, 6.3e+02, 1.8e+02

Total CPU time (secs) = 0.11

CPU time per iteration = 0.02

termination code = 0

DIMACS: 1.3e-12 0.0e+00 1.5e-10 0.0e+00 5.2e-09 5.2e-09

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Status: Solved

Optimal value (cvx\_optval): +26666.7

Optimal value of number of ceramics: 53

Optimal value of number of copper: 27

The max profit in euros is: 26667

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