

```
In [1]: import sys, os
import docplex.mp
from docplex.mp.model import Model

path = 'D:\SISTEMAS\SEMESTRE-2020-2\Pesquisa Operacional\Lista1'
os.chdir(path)
```

```
In [2]: modelo = Model(name='Lista_1_Questao_2')
```

```
In [4]: Q1 = modelo.continuous_var(name='Quantidade do Produto 1')
Q2 = modelo.continuous_var(name='Quantidade do Produto 2')
```

```
In [5]: # Restrições
modelo.add_constraint(Q1 >= 0)
modelo.add_constraint(Q2 >= 0)
modelo.add_constraint(2*Q1 + 2*Q2 <= 160)
modelo.add_constraint(1*Q1 + 2*Q2 <= 120)
modelo.add_constraint(4*Q1 + 2*Q2 <= 280)
```

```
Out[5]: docplex.mp.LinearConstraint[(4Quantidade do Produto 1+2Quantidade do Produto 2,LE,280)
```

```
In [6]: # Função Objetiva
modelo.maximize(1*Q1 + 1.5*Q2)
```

```
In [7]: modelo.print_information()
```

```
Model: Lista_1_Questao_2
- number of variables: 2
  - binary=0, integer=0, continuous=2
- number of constraints: 5
  - linear=5
- parameters: defaults
- objective: maximize
- problem type is: LP
```

```
In [8]: otimizacao = modelo.solve()
modelo.print_solution()
```

```
objective: 100.000
"Quantidade do Produto 1"=40.000
"Quantidade do Produto 2"=40.000
```

```
In [9]: modelo.parameters.lpmethod = 4
modelo.solve(url=None, key=None, log_output=True)
```

```
Version identifier: 20.1.0.0 | 2020-11-11 | 9bedb6d68
CPXPARAM_Read_DataCheck          1
CPXPARAM_LPMethod                 4
Tried aggregator 1 time.
LP Presolve eliminated 2 rows and 0 columns.
Reduced LP has 3 rows, 2 columns, and 6 nonzeros.
Presolve time = 0.11 sec. (0.00 ticks)
Parallel mode: using up to 4 threads for barrier.
Number of nonzeros in lower triangle of A*A' = 3
Using Approximate Minimum Degree ordering
Total time for automatic ordering = 0.03 sec. (0.00 ticks)
```

Summary statistics for Cholesky factor:

Threads = 4
 Rows in Factor = 3
 Integer space required = 3
 Total non-zeros in factor = 6
 Total FP ops to factor = 14

Itn	Primal Obj	Dual Obj	Prim Inf	Upper Inf	Dual Inf	Inf Ratio
0	9.7777778e+01	0.0000000e+00	8.89e+00	0.00e+00	8.00e+00	1.00e+00
1	9.4372653e+01	7.1033966e+01	1.63e-01	0.00e+00	1.85e+00	4.00e+00
2	9.9466570e+01	1.0152618e+02	8.22e-02	0.00e+00	2.07e-01	4.95e+01
3	9.9999868e+01	1.0003041e+02	1.01e-03	0.00e+00	2.34e-03	6.25e+03
4	9.9999996e+01	9.9999999e+01	1.01e-07	0.00e+00	2.88e-07	4.24e+07
5	1.0000000e+02	1.0000000e+02	1.02e-11	0.00e+00	2.88e-11	4.09e+11
6	1.0000000e+02	1.0000000e+02	6.54e-14	0.00e+00	3.06e-15	4.09e+15

Barrier time = 0.16 sec. (0.01 ticks)

Parallel mode: deterministic, using up to 4 threads for concurrent optimization:

* Starting dual Simplex on 1 thread...
 * Starting primal Simplex on 1 thread...

Dual crossover.

Dual: Fixed no variables.

Primal: Fixed no variables.

Dual simplex solved model.

Total crossover time = 0.09 sec. (0.00 ticks)

Total time on 4 threads = 0.36 sec. (0.01 ticks)

Out[9]: docplex.mp.solution.SolveSolution(obj=100,values={Quantidade do Produto ..

In [10]: `%notebook "D:\SISTEMAS\SEMESTRE-2020-2\Pesquisa Operacional\Lista1\Questao_2.ipynb"`