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_9')
```

In [3]:
```
X1 = modelo.continuous_var(name='X1')
X2 = modelo.continuous_var(name='X2')
```

In [4]:
```
# Função Objetiva
modelo.maximize(5*X1 + 4*X2)
```

In [5]:
```
# Restrições
modelo.add_constraint(X1 >= 0)
modelo.add_constraint(X2 >= 0)
modelo.add_constraint(+6*X1 + 4*X2 <= 24)
modelo.add_constraint(+1*X1 + 2*X2 <= 6)
modelo.add_constraint(-1*X1 + 1*X2 <= 1)
modelo.add_constraint(X2 <= 2)
```

Out[5]:
```
docplex.mp.LinearConstraint[](X2,LE,2)
```

In [6]:
```
modelo.print_information()
```

```
Model: Lista_1_Questao_9
 - number of variables: 2
   - binary=0, integer=0, continuous=2
 - number of constraints: 6
   - linear=6
 - parameters: defaults
 - objective: maximize
 - problem type is: LP
```

In [7]:
```
otimizacao = modelo.solve()
modelo.print_solution()
```

```
objective: 21.000
  X1=3.000
  X2=1.500
```

In [8]:
```
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 3 rows and 0 columns.
Reduced LP has 3 rows, 2 columns, and 6 nonzeros.
Presolve time = 0.02 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 = 0.00 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   2.2500000e+02   1.2166667e+01  3.69e+02  4.80e+01  1.63e+01  1.00e+00
   1   5.5890668e+01   3.0932187e+01  7.35e+01  9.56e+00  1.32e+00  2.42e+04
   2   2.2212098e+01   2.1359458e+01  4.88e+00  6.35e-01  2.52e-01  4.68e+02
   3   2.1828888e+01   2.1604330e+01  1.64e+00  2.13e-01  1.49e-02  4.89e+03
   4   2.1008603e+01   2.1004920e+01  1.56e-02  2.03e-03  1.17e-04  2.43e+05
   5   2.1000001e+01   2.1000000e+01  1.56e-06  2.03e-07  1.30e-08  1.84e+09
   6   2.1000000e+01   2.1000000e+01  1.56e-10  2.03e-11  1.30e-12  1.85e+13
Barrier time = 0.03 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 = 0.03 sec. (0.00 ticks)

Total time on 4 threads = 0.08 sec. (0.02 ticks)
```

Out[8]: docplex.mp.solution.SolveSolution(obj=21,values={X1:3,X2:1.5})

In [9]:
```
%notebook "D:\SISTEMAS\SEMESTRE-2020-2\Pesquisa Operacional\Lista1\Questao_9.ipynb"
```