In [2]:
```
from pulp import *
```

Problem 1

In [3]:
```
Lp_prob = LpProblem('Question1b', LpMaximize)
x_b = LpVariable('x_b') # Bands
x_c = LpVariable('x_c') # Coils
```

In [4]:
```
# Objective function
Lp_prob += 25 * x_b + 30 * x_c

# Constraints
Lp_prob += x_b <= 6000
Lp_prob += x_c <= 4000
Lp_prob += (x_b  * (1 / 200)) + (x_c * (1 / 140)) <= 40
Lp_prob += x_b >= 0
Lp_prob += x_c >= 0
```

In [5]:
```
print(Lp_prob)
```

```
Question1b:
MAXIMIZE
25*x_b + 30*x_c + 0
SUBJECT TO
_C1: x_b <= 6000

_C2: x_c <= 4000

_C3: 0.005 x_b + 0.00714285714286 x_c <= 40

_C4: x_b >= 0

_C5: x_c >= 0

VARIABLES
x_b free Continuous
x_c free Continuous
```

In [6]:
```
Lp_prob.solve()
LpStatus[Lp_prob.status]
```

```
Welcome to the CBC MILP Solver
Version: 2.10.3
Build Date: Dec 15 2019

command line - /Users/mercurymcindoe/Documents/Mercury/UBC/CPEN 4-2/MATH 34
0/Assignments/.venv/lib/python3.13/site-packages/pulp/solverdir/cbc/osx/64/c
bc /var/folders/py/b14h3jpn1036ckyvg60q2fp40000gn/T/da9925a0843d4266b9c7c2a9
b4bc01c8-pulp.mps -max -timeMode elapsed -branch -printingOptions all -solut
ion /var/folders/py/b14h3jpn1036ckyvg60q2fp40000gn/T/da9925a0843d4266b9c7c2a
9b4bc01c8-pulp.sol (default strategy 1)
At line 2 NAME          MODEL
At line 3 ROWS
At line 10 COLUMNS
At line 19 RHS
At line 25 BOUNDS
At line 28 ENDATA
Problem MODEL has 5 rows, 2 columns and 6 elements
Coin0008I MODEL read with 0 errors
Option for timeMode changed from cpu to elapsed
Presolve 1 (-4) rows, 2 (0) columns and 2 (-4) elements
0  Obj -0 Dual inf 65.714284 (2)
1  Obj 192000
Optimal - objective value 192000
After Postsolve, objective 192000, infeasibilities - dual 0 (0), primal 0 (
0)
Optimal objective 192000 - 1 iterations time 0.002, Presolve 0.00
Option for printingOptions changed from normal to all
Total time (CPU seconds):       0.00   (Wallclock seconds):       0.01
```

Out[6]: 'Optimal'

In [7]:
```
print("x = ", value(x_b), ", y = ", value(x_c))
print("Optimal Solution: ", value(Lp_prob.objective), " dollars")
```

```
x =  6000.0 , y =  1400.0
Optimal Solution:  192000.0  dollars
```