In [1]:
```
#Problem 2-2

using JuMP, Cbc
m=Model()

#data
NPV = [6,5,12,13,9]
cash_expenditure=[6 2 8 10 2;
                  2 5 9 11 9;
                  4 3 10 9 6;
                  2 3 4 8 3]
yearlybudget = 20 #(mil)

#decision variables
@variable(m, x[i=1:5] <= 1) #companies

#objective
@objective(m, Max, sum(x[i] * NPV[i] for i in 1:5))

#constraints
@constraint(m, [year in 1:4], sum(x[i] * cash_expenditure[year, i] for i in 1:5) <=
@constraint(m, sum(x[i] for i in 3:4) <= 0.4 * sum(x[i] for i in 1:5))

set_optimizer(m, Cbc.Optimizer)
optimize!(m)
```

```
Presolve 4 (-1) rows, 5 (0) columns and 20 (-5) elements
0  Obj 45 Primal inf 3.4545425 (3)
3  Obj 27.578512
Optimal - objective value 27.578512
After Postsolve, objective 27.578512, infeasibilities - dual 0 (0), primal 0 (0)
Optimal objective 27.5785124 - 3 iterations time 0.002, Presolve 0.00
```

In [ ]: