1. Thrift Store [5 pts]

How should you make change for 99 cents if the goal is to minimize the total weight of the coins used? The following table shows the weight of each type of coin. You may use any number of each type of coin.

Type of Coin	penny	nickel	dime	quarter
Weight (grams)	2.50	5.000	2.268	5.670

In [1]:
```
# data
coins  = [0.01, 0.05, 0.10, 0.25]
weights = [2.50, 5.00, 2.268, 5.670]
```

In [2]:
```
using JuMP, Clp, Gurobi, Mosek, GLPK

m = Model(solver = MosekSolver())

@variable(m, x[1:4] >= 0, Int)

@constraint(m, x[1]*coins[1] + x[2]*coins[2] + x[3]*coins[3] + x[4]*coins[

@expression(m, total_weight, x[1]*weights[1] + x[2]*weights[2] + x[3]*weig

@objective(m, Min, total_weight)
```

Out[2]: :Optimal

In [3]:
```
println("The total weight (in grams) is ", getobjectivevalue(m))

for i = 1:4
    println("Quantity of ", coins[i], ": ", getvalue(x[i]))
end
```

```
The total weight (in grams) is 31.546
Quantity of 0.01: 4.0
Quantity of 0.05: 0.0
Quantity of 0.1: 2.0
Quantity of 0.25: 3.0
```