Assignment 1

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Problem 2

```
# Initialize A and b
b = matrix(c(1,0,.25,.15),4,1)
A = matrix(c(1,.45,0,.14,1,-.55,1,.2,1,0,0,.2,1,0,0,.1),4,4)

# Solve for percents and amounts
percents = solve(A) %*% b
print(percents)
```

```
##           [,1]
## [1,] 0.3055556
## [2,] 0.2500000
## [3,] 0.1277778
## [4,] 0.3166667
```

```
amounts = percents*100
print(amounts)
```

```
##          [,1]
## [1,] 30.55556
## [2,] 25.00000
## [3,] 12.77778
## [4,] 31.66667
```

Problem 4

```
# Initialize A and b
b = matrix(c(-45,-3,-31,-45,18,8,20,2,-27,-38,0),11,1)
A = matrix(c(1,1,1,1,0,0,0,0,0,0,1,-1,0,0,0,1,1,1,0,0,0,1,0,-1,0,0,-1,0,0,1,1,0,1,0,0,-1,0,0,-1,0,-1,0,
```

```
# Solve for A_hat and b_hat
A_hat = t(A) %*% A
b_hat = t(A) %*% b

# Solve for ranks with A_hat and b_hat
ranks = solve(A_hat) %*% b_hat
print(ranks)
```

```
##       [,1]
## [1,] -24.8
## [2,]  18.2
## [3,]  -8.0
## [4,]  -3.4
## [5,]  18.0
```