Práctica 3

Problema 1

Apartado 1

```
rentalStates <- c("Downtown", "East", "West")
rentalTransition <- matrix(c(0.3, 0.3, 0.4, 0.4, 0.4, 0.2, 0.5, 0.3, 0.2),
                    byrow=T, nrow=3, dimnames=list(rentalStates, rentalStates))
```

Apartado 2

```
mcRental <- new ("markovchain", states=rentalStates, byrow=T,
          transitionMatrix=rentalTransition, name="Rental Cars")
```

Apartado 3

```
plot(mcRental)
```

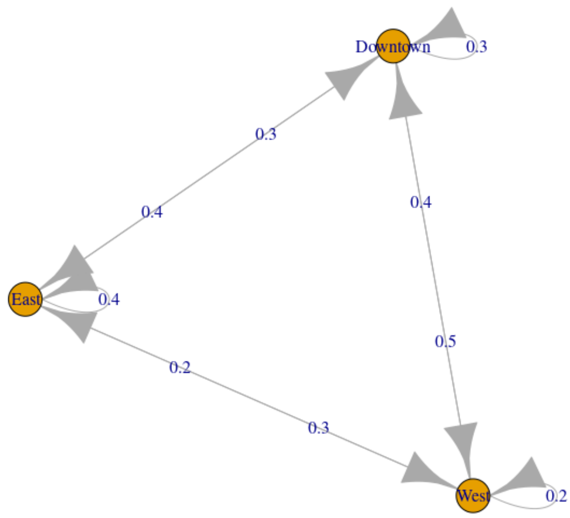

Diagrama de transición

Apartado 4

```
probabilidadInicial = matrix(data=c(1, 0, 0), ncol=3)
dias = 2
probabilidadFinal = probabilidadInicial %*% (rentalTransition^dias)
```

```
> probabilidadFinal
     Downtown East West
[1,]     0.09 0.09 0.16
```

Siendo la solución 0,9.

Apartado 5

```
distribucionEstacionaria <- steadyStates(mcRental)
```

```
> distribucionEstacionaria
      Downtown      East      West
[1,] 0.3888889 0.3333333 0.2777778
```

Problema 2

Apartado 1

```
mquimio = matrix(data=c(0.8671, 0.0024, 0.1270, 0.0035, 0, 1, 0, 0, 0, 0, 0, 0, 0.8623,
                        0, 0.1377, 0, 0, 0.9, 0.1, 0, 0, 0, 0, 0, 1))
mquimioB = matrix(data=c(0.8720, 0.0273, 0.0823, 0.0184, 0, 1, 0, 0, 0, 0, 0, 0, 0.8771,
                        0, 0.1229, 0, 0, 0.9, 0.1, 0, 0, 0, 0, 0, 1))
```

```
> quimio
       [,1] [,2]   [,3] [,4] [,5]
[1,] 0.8671    1 0.0000  0.0    0
[2,] 0.0024    0 0.0000  0.0    0
[3,] 0.1270    0 0.8623  0.9    0
[4,] 0.0035    0 0.0000  0.1    0
[5,] 0.0000    0 0.1377  0.0    1
```

```
> quimioB
       [,1] [,2]   [,3] [,4] [,5]
[1,] 0.8720    1 0.0000  0.0    0
[2,] 0.0273    0 0.0000  0.0    0
[3,] 0.0823    0 0.8771  0.9    0
[4,] 0.0184    0 0.0000  0.1    0
[5,] 0.0000    0 0.1229  0.0    1
```

Apartado 2

```
quimio <- new ("markowchain", states=c("R", "CL", "P", "CG", "M"), transitionMatrix=mquimio, name="Quimio")
quimioB <- new ("markowchain", states=c("R", "CL", "P", "CG", "M"), transitionMatrix=mquimioB, name="Quimio + B")
```

Apartado 3

```
plot(quimio, package="diagram", box.size=0.04)
plot(quimioB, package="diagram", box.size=0.04)
```

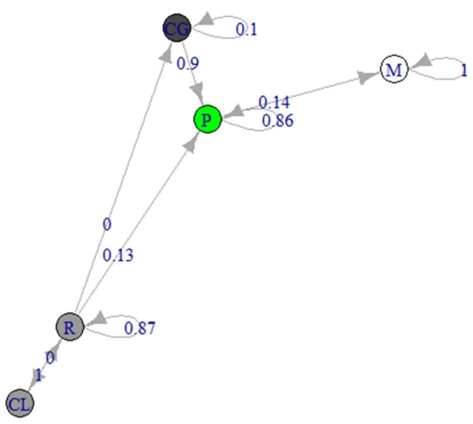

Diagrama de transición de `quimio`

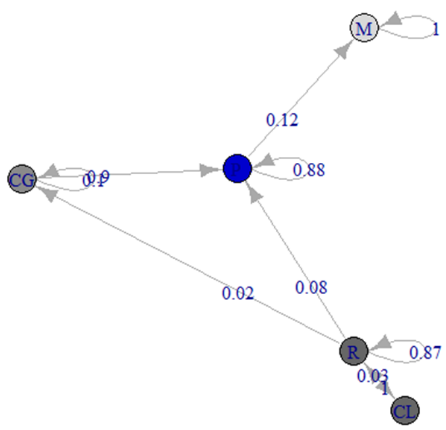

Diagrama de transición de `quimioB`

Apartado 4

```
probQ = matrix(data=c(0, 0, 1, 0, 0), ncol=5)
probQB = matrix(data=c(0, 0, 1, 0, 0), ncol=5)
meses = 3
quimio3meses = quimio^meses
quimioB3meses = quimioB^meses
probQ = probQ%*%quimio3meses
probQB = probQB%*%quimioB3meses
```

```
> probQ
     [,1] [,2]      [,3]  [,4]       [,5]
[1,]    0    0 0.6411729     0 0.00261097
```

```
> probQB
     [,1] [,2]      [,3]  [,4]        [,5]
[1,]    0    0 0.6747569     0 0.001856332
```

Apartado 5

```
distribucionEstacionaria = steadyStates(quimio)
distribucionEstacionariaB = steadyStates(quimioB)
```

```
> distribucionEstacionaria
     R CL P CG M
[1,] 0  0 0  0 1
```

```
> distribucionEstacionariaB
     R CL P CG M
[1,] 0  0 0  0 1
```