Punto 3

Insesgades mediante montecarlo

In [ ]:
```
b_1 = 7.3832
b_2 = 0.2323
sigma2 = 46.853
var_b1 = 16.0669
var_b2 = 0.00306
```

In [ ]:
```
X = c(25.83,34.31,42.50,46.75,48.29,48.77,
        49.65,51.94,54.33,54.87,56.46,58.83,
        59.13,60.73,61.12,63.10,65.96,66.40,
        70.42,70.48,71.98,72.00,72.23,72.23,
        73.44,74.25,74.77,76.33,81.02,81.85,
        82.56,83.33,83.40,91.81,91.81,92.96,
        95.17,101.40,114.13,115.46)
```

In [ ]:
```
Y = matrix(nrow = 1000,ncol = length(X))
```

In [ ]:
```
e = rnorm(40, mean = 0, sd = sqrt(sigma2))
```

In [ ]:
```
for (i in 1:nrow(Y)) {
    Y_e = b_1 + b_2*X + rnorm(40,mean = 0,sd = sqrt(sigma2))
    Y[i,]=Y_e
}
```

In [ ]:
```
B_e = matrix(nrow = nrow(Y),ncol = 2)

for (i in 1:nrow(Y)) {
    fit=lm(Y[i,]~X)
    B_e[i,] = fit$coefficients
}
```

In [ ]:
```
mean(B_e[,1])
mean(B_e[,2])
```

```
var(B_e[,1])
var(B_e[,2])
```

7.50544699832276

0.231449055634799

17.3672386267282

0.00326295501356399

In [ ]:
```
mean(B_e[,1])-b_1
mean(B_e[,2])-b_2
var(B_e[,1])-var_b1
var(B_e[,2])-var_b2
```

0.12224699832276

-0.000850944365201417

1.30033862672817

0.000202955013563992

como se nota, las diferencias entre los betas estimados mediante montecarlo y los betas poblacionales dados son cercanas a cero, lo que comprueba la insegades de los parametros.