intervencion

2022-10-08

```r
#A. Posterior en t=19
m19 <- c(8, 0.35, -0.27)
C19 <- matrix(c(0.00002, 0.00001, -0.00002, 0.00001, 0.00004, -0.00001
                -0.00001, 0.00005), ncol = 3)

#Valores conocidos de G20 y W20
G20 <- matrix(c(1.05, 0, 0, 0, 1.02, 0, 0, 0, 0.99), ncol=3)
W20 <- matrix(c(0.00001, 0, 0, 0, 0.0001, -0.00001, 0, -0.00001, 0.0000

#B. Priori de parámetros en t=20
a20 <- G20 %*% m19
R20 <- G20 %*% C19 %*% t(G20) + W20
a20
```

```
##          [,1]
## [1,]   8.4000
## [2,]   0.3570
## [3,]  -0.2673
```

```r
R20
```

```
##               [,1]        [,2]        [,3]
## [1,]   3.205e-05   1.071e-05  -2.079e-05
## [2,]   1.071e-05   1.416e-04  -2.010e-05
## [3,]  -2.079e-05  -2.010e-05   9.901e-05
```

```r
a20_int <- c(8.4000, 0.7, -0.2673)
R20_int <- matrix(c(3.205e-05, 0.000010710, -2.0790e-05, 1.071e-05, 0.0
                    -2.0098e-05, -2.079e-05, -0.000020098, 9.9005e-05)

F20 <- c(1, 6.06093, 4.51018) #Variables explicativas en t=20. El 1 es
                              #agregar el intercepto
S19 <- 0.002 # Estimación de V en T=19
n19 <- 19.5 # Grados de libertad
#C. Pronóstico a un periodo.
```

```
f20 <- as.numeric(t(F20) %*% a20_int)
Q20 <- as.numeric(t(F20) %*% R20_int %*% F20 + S19)
f20
```

```
## [1] 11.44
```

```
Q20
```

```
## [1] 0.03962
```

```
c(qst(0.025, nu = n19, mu = f20, sigma = sqrt(Q20)),
  qst(0.975, nu = n19, mu = f20, sigma = sqrt(Q20)))
```

```
## [1] 11.02 11.85
```

```
#Valor observado de Y20:
Y20 <- 11.05
#D. Posterior en t=20
A20 <- R20_int %*% F20 / Q20
e20 <- Y20-f20
m20 <- a20_int + A20 %*% e20
n20 <- n19 + 1
S20 <- S19 + (S19/n20)*(e20^2/Q20-1)
C20 <- (S20/S19)*(R20_int-A20 %*% t(A20) * Q20)
m20
```

```
##           [,1]
## [1,]   8.4000
## [2,]   0.6416
## [3,]  -0.2703
```

```
C20
```

```
##              [,1]        [,2]        [,3]
## [1,]   3.640e-05   1.162e-05  -2.364e-05
## [2,]   1.162e-05   1.104e-04  -7.492e-05
## [3,]  -2.364e-05  -7.492e-05   1.098e-04
```

Distribuciones filtradas

```
U20 <- chol(R20_int)
Z20 <- chol(R20)
K20 <- U20 %*% solve(Z20)
G20_int <- K20 %*% G20
W20_int <- K20 %*% W20 %*% t(K20)
```

```r
B19 <- C19 %*% t(G20_int) %*% solve(R20_int)
a20_menos_1 <- m19 + B19 %*% (m20 - a20_int)
R20_menos_1 <- C19 - B19 %*% (C20 - R20_int) %*% solve(B19)

a20_menos_1
```

```
##           [,1]
## [1,]   7.9994
## [2,]   0.3440
## [3,]  -0.2712
```

```r
S20/S19 * R20_menos_1
```

```
##              [,1]      [,2]       [,3]
## [1,] -2.193e-05 0.0001042 -1.693e-05
## [2,] -4.918e-04 0.0011079 -2.590e-05
## [3,] -1.569e-04 0.0002566  3.208e-05
```

```r
F19 <- c(1, 6.05563 , 4.53957) #Variables explicativas en t=19. El 1 e
                               #agregar el intercepto
t(F19) %*% a20_menos_1
```

```
##         [,1]
## [1,] 8.851
```

```r
S20/S19 * t(F19) %*% R20_menos_1 %*% F19
```

```
##          [,1]
## [1,] 0.04447
```