CU34_MODEL_DEVELOPMENT_03_SIMULACION

June 13, 2023

\#

CU34_Predicción de demanda de servicios

1 IV. Model development

En este anexo se incluye el código utilizado durante el desarrollo de los modelos incluidos en el caso de uso.

```
[1]: Sys.setlocale(category = "LC_ALL", locale = "es_ES.UTF-8")
```

'es_ES.UTF-8/es_ES.UTF-8/es_ES.UTF-8/C/es_ES.UTF-8/C'

1.1 Modelo SIMULACION

1.2 Paquetes

```
[2]: library(readr)
     library(purrr)
     library(tibble)
```

1.3 Datos

```
[3]: escenario <- read_csv("ESCENARIO_SERVICIOS.csv")

     pfutbol <- sum(escenario$Futbol == 1) / nrow(escenario)
     rate_nservicios <- mean(escenario$nservicios)
     rate_capacidad <- mean(escenario$capacidad)
     m_cont <- apply(escenario[,4:25], 2, mean)
     s_cont <- apply(escenario[,4:25], 2, sd)
```

Rows: 100 **Columns:** 25
  Column specification

Delimiter: ","
dbl (25): Futbol, nservicios, capacidad, tmed, prec, velmedia,
presMax, t1_1…

  Use `spec()` to retrieve the full column specification for this
data.

```
  Specify the column types or set `show_col_types = FALSE` to quiet
  this message.
```

1.4 Simulación

```
[4]: nsim <- 1000

     mat <- matrix(rep(NA_real_, nsim*ncol(escenario)), ncol = ncol(escenario))

     mat[, 1] <- rbinom(nsim, size = 1, prob = pfutbol)
     mat[, 2:3] <- sapply(c(rate_nservicios, rate_capacidad),
                          function(x) rpois(nsim, lambda = x))

     mat[, 4:25] <- sapply((4:25) - 3,
                           function(x) rnorm(nsim, mean = m_cont[x], sd = s_cont[x]))

     colnames(mat) <- colnames(escenario)

     simulacion <- as_tibble(mat)
```

```
[5]: glimpse(simulacion)
```

```
Rows: 1,000
Columns: 25
$ Futbol        <dbl> 0, 0, 0, 0, 0, 1, 0, 1, 1, 0, 1, 1,
0, 0, 0, 0, 0, 0,…
$ nservicios    <dbl> 15, 12, 12, 18, 17, 16, 9, 22, 21,
17, 9, 17, 13, 20,…
$ capacidad     <dbl> 77, 74, 78, 65, 63, 90, 70, 71, 63,
78, 72, 68, 70, 6…
$ tmed          <dbl> 4.544125, 10.441570, 7.442506,
7.425750, 7.223578, 8.…
$ prec          <dbl> 0.34062290, -1.08651944,
-0.07995846, 1.50459822, 2.5…
$ velmedia      <dbl> 1.80643454, 1.65269822, 1.73911308,
2.39094249, 1.414…
$ presMax       <dbl> 968.7190, 947.9568, 953.0482,
948.5157, 954.1340, 954…
$ t1_1          <dbl> 1499.5222, 1676.9225, 1968.1704,
1358.5512, 755.7294,…
$ t2_1          <dbl> 0.5646380, 0.5348401, 0.5138715,
0.5324088, 0.5153299…
$ t2_2          <dbl> 0.4541116, 0.4497161, 0.4846589,
0.4406994, 0.4976548…
$ t3_1          <dbl> 33.31352, 54.20558, 44.97541,
37.15042, 33.49787, 42.…
$ t4_1          <dbl> 0.15390149, 0.07396279, 0.16766487,
0.11075095, 0.187…
```

```
$ t4_2            <dbl> 0.6595090, 0.6865000, 0.6113174,
0.6083341, 0.6531161…
$ t4_3            <dbl> 0.19464037, 0.10987328, 0.20351146,
0.02104825, 0.254…
$ t5_1            <dbl> 0.18499626, 0.16885911, 0.27943119,
0.27257173, 0.146…
$ t6_1            <dbl> 0.24241075, 0.23408886, 0.04529902,
0.35798803, 0.360…
$ t7_1            <dbl> 0.06777850, 0.04607720, 0.02842602,
0.04774275, 0.081…
$ t8_1            <dbl> 0.05912861, 0.03292578, 0.02536174,
0.06471854, 0.015…
$ t9_1            <dbl> 0.4074883, 0.4673972, 0.3966161,
0.3628494, 0.1968037…
$ t10_1           <dbl> 0.11258084, 0.05797762, 0.03849303,
0.14448410, 0.129…
$ t11_1           <dbl> 0.5428592, 0.4752015, 0.4504140,
0.3365267, 0.5301107…
$ t12_1           <dbl> 0.5279616, 0.5434032, 0.6829429,
0.4908414, 0.6474422…
$ area            <dbl> -2070678.2, -3815332.6, 698574.8,
325532.9, -3427687.…
$ elevation       <dbl> 765.5048, 863.8172, 672.6513,
714.4876, 663.4118, 592…
$ densidad_hab_km2 <dbl> 43257.282, 18510.746, -13499.931,
-7679.538, -9777.49…
```