Trabajo RLM Parte I

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Análisis Descriptivo

```
library(plotrix)
```

```
## Warning: package 'plotrix' was built under R version 4.0.3
```

```
library(knitr)
library(GGally)
```

```
## Warning: package 'GGally' was built under R version 4.0.5

## Loading required package: ggplot2

## Registered S3 method overwritten by 'GGally':
##   method from
##   +.gg   ggplot2
```

```
library(ggplot2)
```

```
datos <- read.table("APC1modifm3.csv", header = T, sep = ";", dec = ",",
                    colClasses = c(rep("numeric",7),"factor",rep("numeric",3),"factor"))
```

```
str(datos)
```

```
## 'data.frame':    90 obs. of  12 variables:
##  $ ID     : num  5 10 13 18 27 28 29 31 33 34 ...
##  $ DPERM  : num  11.2 8.84 12.78 11.62 9.31 ...
##  $ EDAD   : num  56.5 56.3 56.8 53.9 47.2 52.1 54.5 49.9 54.1 54 ...
##  $ RINF   : num  5.7 6.3 7.7 6.4 4.5 3.2 4.4 5 5.3 6.1 ...
##  $ RRC    : num  34.5 29.6 46 25.5 30.2 10.8 18.6 19.7 17.3 24.2 ...
##  $ RRX    : num  88.9 82.6 116.9 99.2 101.3 ...
##  $ NCAMAS : num  180 85 322 133 170 176 248 318 196 312 ...
##  $ AEM    : Factor w/ 2 levels "1","2": 2 2 1 2 2 2 2 2 2 2 ...
##  $ PDP    : num  134 59 252 113 124 156 217 270 164 258 ...
##  $ NENFERM: num  151 66 349 101 173 88 189 335 165 169 ...
##  $ FSD    : num  40 40 57.1 37.1 37.1 37.1 37.1 57.1 34.3 54.3 ...
##  $ REGION : Factor w/ 4 levels "1","2","3","4": 1 1 1 1 1 1 1 1 1 1 ...
```

```
summary(datos)
```

```
##        ID              DPERM             EDAD            RINF
##  Min.   :  1.00   Min.   : 7.080   Min.   :38.80   Min.   :1.300
##  1st Qu.: 33.25   1st Qu.: 8.390   1st Qu.:51.00   1st Qu.:3.700
##  Median : 62.50   Median : 9.385   Median :53.20   Median :4.400
##  Mean   : 60.17   Mean   : 9.719   Mean   :53.25   Mean   :4.399
##  3rd Qu.: 88.75   3rd Qu.:10.658   3rd Qu.:56.08   3rd Qu.:5.300
##  Max.   :113.00   Max.   :19.560   Max.   :65.90   Max.   :7.800
##       RRC              RRX             NCAMAS      AEM         PDP
##  Min.   : 1.60   Min.   : 39.60   Min.   : 29.0   1:13   Min.   : 20.00
##  1st Qu.: 8.40   1st Qu.: 69.20   1st Qu.:102.0   2:77   1st Qu.: 66.25
##  Median :14.05   Median : 85.40   Median :184.0          Median :136.50
##  Mean   :16.13   Mean   : 82.24   Mean   :246.9          Mean   :186.56
##  3rd Qu.:20.75   3rd Qu.: 96.05   3rd Qu.:305.8          3rd Qu.:247.00
##  Max.   :60.50   Max.   :133.50   Max.   :835.0          Max.   :791.00
##     NENFERM            FSD        REGION
##  Min.   : 19.00   Min.   :14.30   1:23
##  1st Qu.: 66.25   1st Qu.:31.40   2:25
##  Median :124.50   Median :41.45   3:29
##  Mean   :165.97   Mean   :42.16   4:13
##  3rd Qu.:208.75   3rd Qu.:51.40
##  Max.   :629.00   Max.   :74.30
```

```
attach(datos)
```

Análisis de variables numéricas

```
cond <- names(datos) != c("ID", "AEM", "REGION")
numvar <- names(datos)[cond]
tableList <- list()

for (variable in numvar) {
    currVar <- datos[variable][[1]]
    Table <- data.frame(round(matrix(c(summary(currVar),sd(currVar)),ncol=7),2))
    names(Table) <- c(names(summary(currVar)),"sd")
    tableList[[variable]] <- list(Table,
                                  paste("Estadísticos de resumen para variable",
                                        variable))
    # print(Table)
}

kable( tableList[[1]][[1]] , caption = tableList[[1]][[2]])
```

Table 1: Estadísticos de resumen para variable DPERM

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
7.08	8.39	9.38	9.72	10.66	19.56	2.03

```
kable( tableList[[2]][[1]] , caption = tableList[[2]][[2]])
```

Table 2: Estadísticos de resumen para variable EDAD

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
38.8	51	53.2	53.25	56.08	65.9	4.59

```
kable( tableList[[3]][[1]] , caption = tableList[[3]][[2]])
```

Table 3: Estadísticos de resumen para variable RINF

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
1.3	3.7	4.4	4.4	5.3	7.8	1.37

```
kable( tableList[[4]][[1]] , caption = tableList[[4]][[2]])
```

Table 4: Estadísticos de resumen para variable RRC

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
1.6	8.4	14.05	16.13	20.75	60.5	10.73

```
kable( tableList[[5]][[1]] , caption = tableList[[5]][[2]])
```

Table 5: Estadísticos de resumen para variable RRX

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
39.6	69.2	85.4	82.24	96.05	133.5	20.1

```
kable( tableList[[6]][[1]] , caption = tableList[[6]][[2]])
```

Table 6: Estadísticos de resumen para variable NCAMAS

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
29	102	184	246.89	305.75	835	185.8

```
kable( tableList[[7]][[1]] , caption = tableList[[7]][[2]])
```

Table 7: Estadísticos de resumen para variable PDP

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
20	66.25	136.5	186.56	247	791	152.75

```
kable( tableList[[8]][[1]] , caption = tableList[[8]][[2]])
```

Table 8: Estadísticos de resumen para variable NENFERM

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
19	66.25	124.5	165.97	208.75	629	129.55

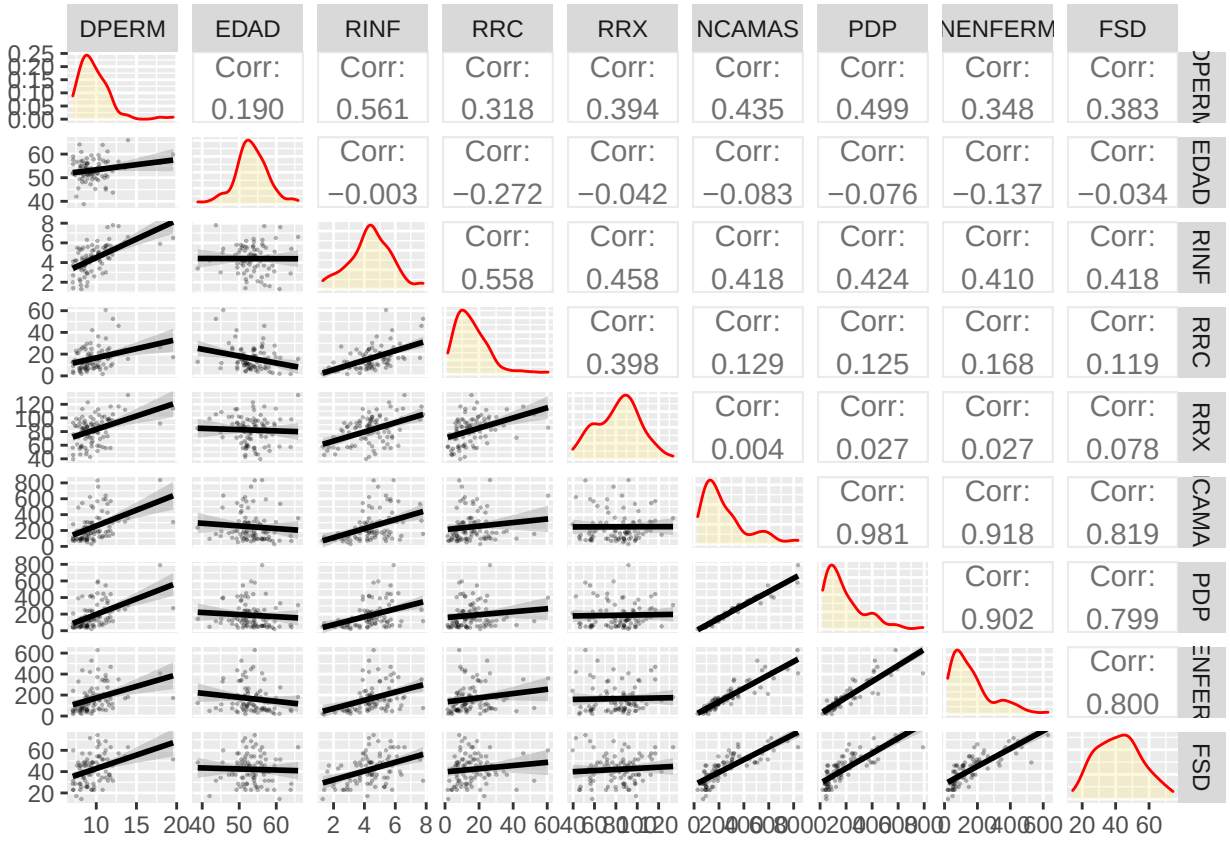
```
kable( tableList[[9]][[1]] , caption = tableList[[9]][[2]])
```

Table 9: Estadísticos de resumen para variable FSD

Min.	1st Qu.	Median	Mean	3rd Qu.	Max.	sd
14.3	31.4	41.45	42.16	51.4	74.3	13.47

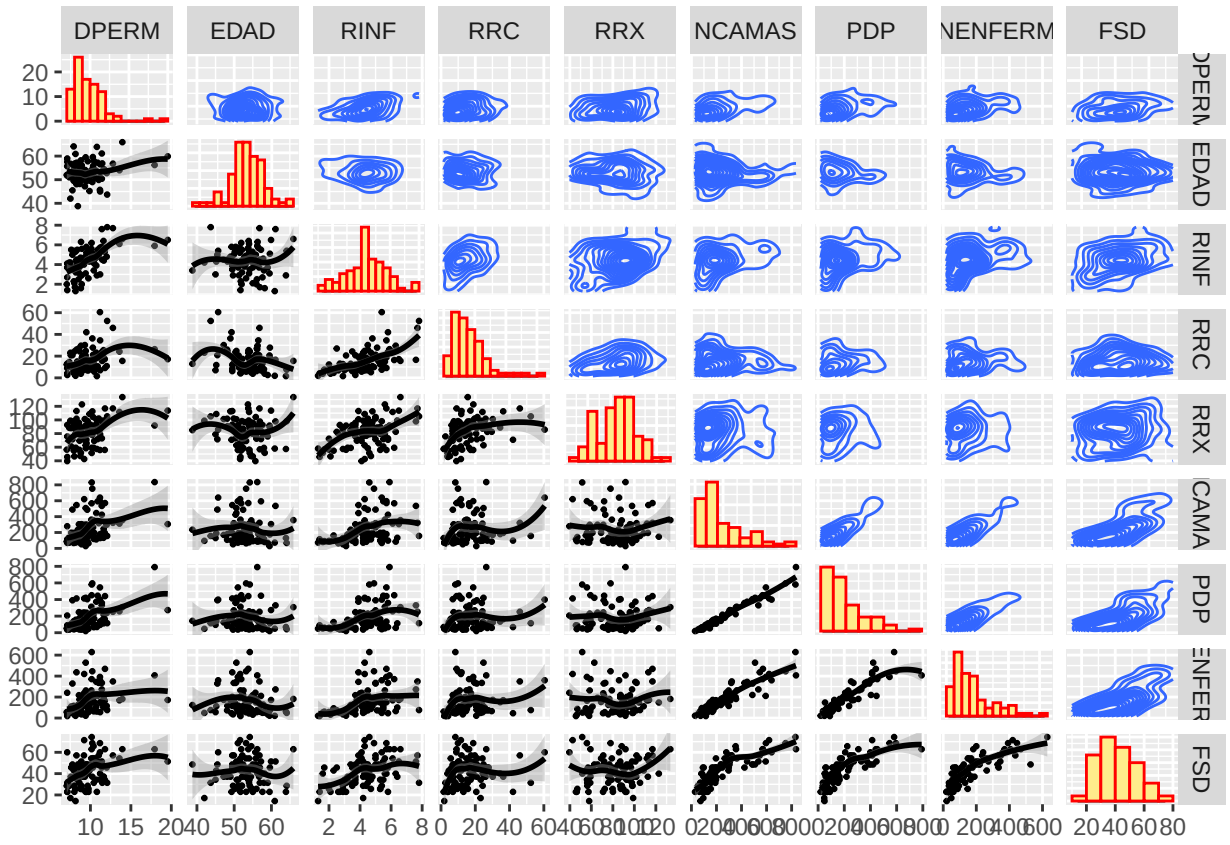
```
datosNumericos <- datos[numvar]

win.graph()
ggpairs(datosNumericos, diag=list(continuous = wrap("densityDiag",color="red",
                                    fill="lightgoldenrod1",alpha=0.3)),
        lower = list(continuous = wrap("smooth", alpha = 0.3, size=0.1,method = "lm")),
        upper = list(continuous = wrap("cor", stars = F)))
```




```
gg2 <- ggpairs(datosNumericos,
               lower = list(continuous = wrap("smooth_loess", cex = 0.5) ),
               upper = list(continuous = "density"))
for(i in 1:ncol(datosNumericos)){
    gg2[i,i] <- gg2[i,i] +
        geom_histogram(breaks=hist(datosNumericos[,i],breaks ="FD",plot=F)$breaks,
                       colour ="red",fill="lightgoldenrod1")

}
win.graph()
gg2
```



Análisis de variables categóricas

```
Table1 <-data.frame(t(summary(AEM)))
colnames(Table1) <- c("Afiliados", "No Afiliados")
kable(Table1, caption = "Hospitales afiliados a la escuela de medicina")
```

Table 10: Hospitales afiliados a la escuela de medicina

Afiliados	No Afiliados
13	77

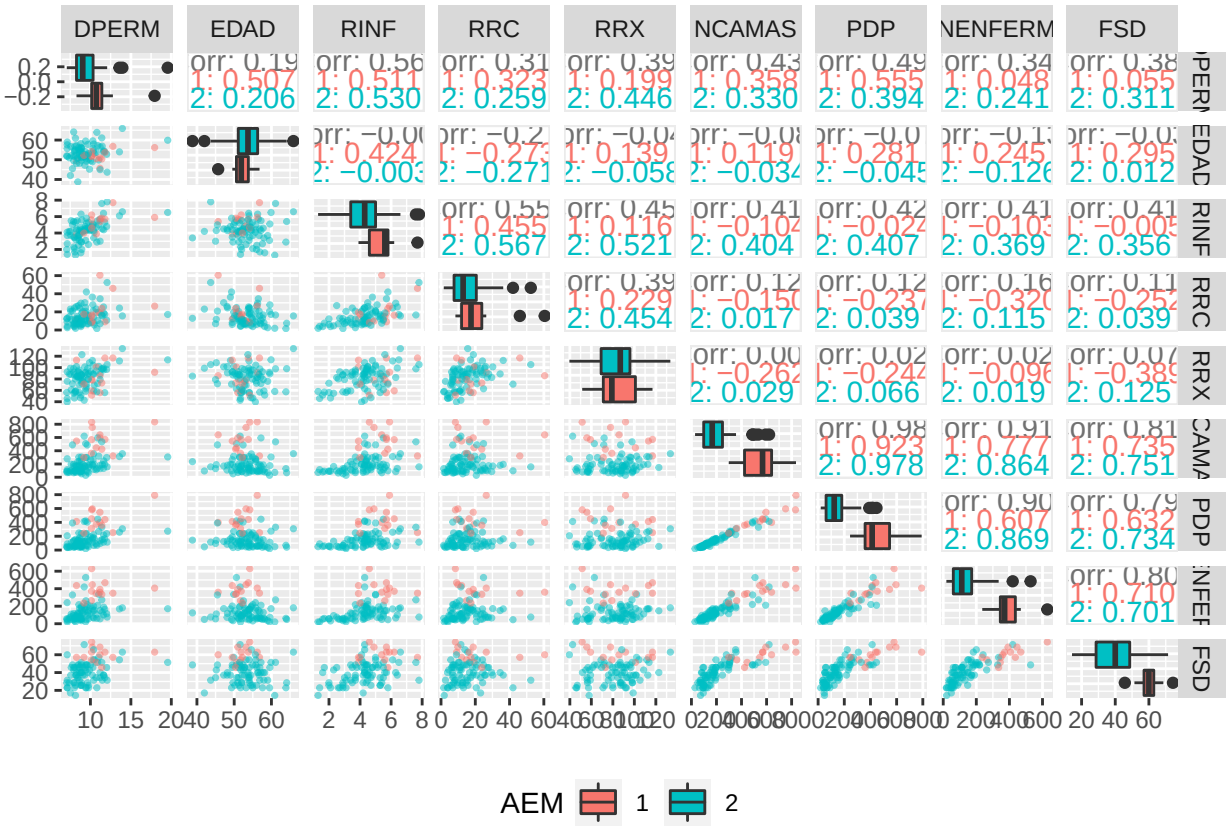
```
Table2 <-data.frame(t(summary(REGION)))
colnames(Table2) <- c("NE", "NC", "S", "W")
kable(Table2, caption = "Hospitales en regiones geográficas")
```

Table 11: Hospitales en regiones geográficas

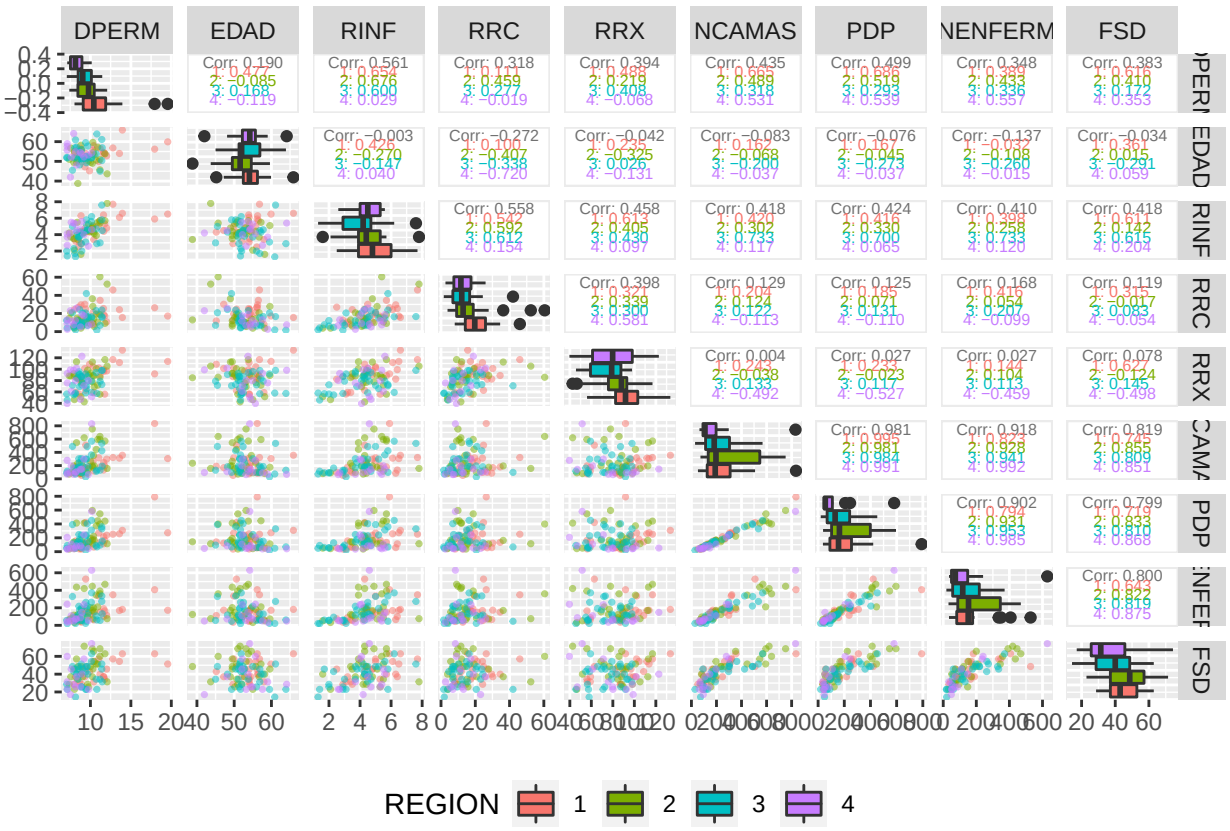
NE	NC	S	W
23	25	29	13

Análisis de variables numéricas agrupadas por variables categóricas

```
win.graph()
ggpairs(datos,columns = c(2:7,9:11),legend = c(1,1),mapping =aes(colour=AEM),
        diag = list(continuous = wrap("box_no_facet")),
        upper = list(continuous = wrap("cor", stars = F)),
        lower = list(continuous = wrap("points", cex = 0.6, alpha = 0.5))) +
    theme(legend.position="bottom")
```




```
win.graph()
ggpairs(datos,columns = c(2:7,9:11),legend = c(1,1),mapping =aes(colour=REGION),
        diag = list(continuous = wrap("box_no_facet")),
        upper = list(continuous = wrap("cor", stars = F, size = 2)),
        lower = list(continuous = wrap("points", cex = 0.6, alpha = 0.5))) +
    theme(legend.position="bottom")
```


DPERM
EDAD
RINF
RRC
RRX
NCAMAS
PDP
NENFERM
FSD
REGION 1 2 3 4