


```
library(ggplot2)
```

```
names <- c("horario", "temp", "vento", "umid", "sensa")
con <- url("https://ic.unicamp.br/~zanoni/cepagri/cepagri.csv")
cepagri <- read.table(con, header = FALSE, fill = TRUE, sep = ";", col.names = names)
```


```
head (cepagri)
```



A data.frame: 6 × 5

	horario	temp	vento	umid	sensa
	<chr>	<chr>	<dbl>	<dbl>	<dbl>
1	02/03/2014-19:08	23.7	59.3	77.1	22.6
2	02/03/2014-19:18	23.4	59.1	77.9	22.3
3	02/03/2014-19:28	23.2	56.7	78.9	22.1
4	02/03/2014-19:38	23.0	55.4	79.2	21.9
5	02/03/2014-19:48	22.8	52.6	79.7	21.7
6	02/03/2014-19:58	22.6	62.6	80.7	21.5

```
tail(cepagri)
```



A data.frame: 6 × 5

	horario	temp	vento	umid	sensa
	<chr>	<chr>	<dbl>	<dbl>	<dbl>
571417	03/04/2025-20:50	20.9	8.6	95.7	NA
571418	03/04/2025-21:00	20.9	9.9	95.6	NA
571419	03/04/2025-21:10	20.9	7.0	95.5	NA
571420	03/04/2025-21:20	20.9	6.3	95.5	NA
571421	03/04/2025-21:30	20.8	7.0	95.6	NA
571422	03/04/2025-21:40	20.9	7.5	95.7	NA

```
class(cepagri)
```




```
'data.frame'
```

```
typeof(cepagri)
```




```
'list'
```

```
sapply(cepagri, class)
```




```
horario:      'character' temp:      'character' vento:      'numeric' umid:      'numeric' sensa:      'numeric'
```

```
cepagri$temp <- as.numeric(cepagri$temp)
```



```
Warning message:
“NAs introduced by coercion”
```

```
class(cepagri$temp)
```



```
'numeric'
```

```
cepagri$horario <- as.POSIXct(cepagri$horario, format = '%d/%m/%Y-%H:%M', tz="America/Sao_Paulo")
class (cepagri$horario)
```



```
'POSIXct' · 'POSIXt'
```

```
totalcepagri <- nrow(cepagri)
print(totalcepagri)
```

[1] 571422

```
cepagri <- cepagri[cepagri$horario >= "2025-01-01" & cepagri$horario < "2025-03-26",]  
totalcepagri <- nrow(cepagri)  
print(totalcepagri)
```

[1] 11843

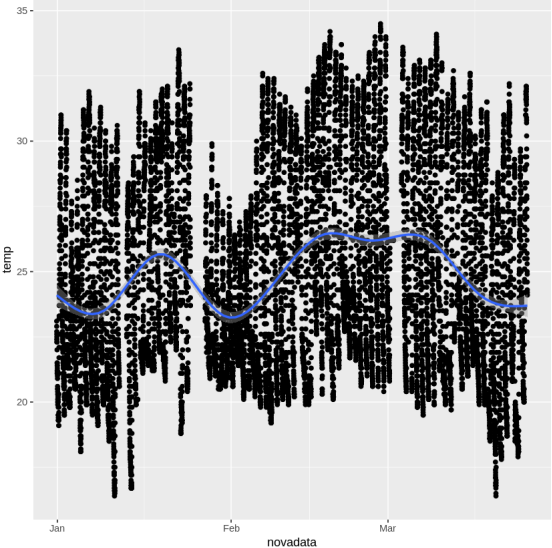
```
periodoleitura <- nrow(cepagri)  
totalexcluidas <- (totalcepagri - periodoleitura)  
print(totalexcluidas)
```

[1] 0

```
cepagri$horario <- as.POSIXlt(cepagri$horario)  
cepagri$ano <- unclass(cepagri$horario)$year + 1900  
cepagri$mes <- unclass(cepagri$horario)$mon + 1
```

```
novadata = as.POSIXct(cepagri$horario)  
gtm18 <- ggplot(cepagri, aes(x = novadata, y = temp))  
gtm18 <- gtm18 + geom_point()  
gtm18 <- gtm18 + geom_smooth()  
gtm18
```

``geom_smooth()` using method = 'gam' and formula = 'y ~ s(x, bs = "cs")'`
Warning message:
"Removed 898 rows containing non-finite outside the scale range
(`stat_smooth()`)."
Warning message:
"Removed 898 rows containing missing values or values outside the scale range
(`geom_point()`)."



```
summary(cepagri)  
med <- mean(cepagri$temp, na.rm = TRUE) #média de temperatura  
md <- median(cepagri$temp, na.rm = TRUE) #mediana  
sd(cepagri$temp, na.rm = TRUE) #desvio padrao  
var(cepagri$temp, na.rm = TRUE) # variancia  
mt <- max(cepagri$temp, na.rm = TRUE) # valor máximo  
mint <- min(cepagri$temp, na.rm = TRUE) # valor mínimo  
quantile(cepagri$temp, na.rm = TRUE) # gerando os quartis
```

horario		temp		vento	
Min.	:2024-12-31 21:00:00.00	Min.	:16.40	Min.	: 0.000
1st Qu.:	:2025-01-23 01:45:00.00	1st Qu.:	:21.50	1st Qu.:	: 0.000
Median	:2025-02-12 18:00:00.00	Median	:24.00	Median	: 4.800
Mean	:2025-02-12 11:04:16.49	Mean	:24.87	Mean	: 5.985
3rd Qu.:	:2025-03-05 07:25:00.00	3rd Qu.:	:28.20	3rd Qu.:	: 9.500
Max.	:2025-03-25 20:50:00.00	Max.	:34.50	Max.	:36.700
		NA's	:898	NA's	:898
umid		sensa		ano	
Min.	: 0.00	Min.	: NA	Min.	:2024
1st Qu.:	: 0.00	1st Qu.:	: NA	1st Qu.:	:2025
Median	: 65.50	Median	: NA	Median	:2025
Mean	: 53.35	Mean	:NaN	Mean	:2025
3rd Qu.:	: 85.20	3rd Qu.:	: NA	3rd Qu.:	:2025
Max.	:100.00	Max.	: NA	Max.	:2025
NA's	:898	NA's	:11843		
4.00748550671496					
16.0599400865305					
0%:	16.4	25%:	21.5	50%:	24
				75%:	28.2
				100%:	34.5

```

plot(cepagri$temp, xlab = "período de medição", ylab = "Temperatura", main = "Temperaturas em Campinas (2025)")
lines(cepagri$temp) # plotando os dados em linha
abline(md,0,col="red") # indicador da média
abline(md,0,col="blue") # indicador da mediana
abline(mt,0,col="purple") # indicador do máximo
abline(mint,0,col="purple3") # indicador do mínimo
quartis <- quantile (cepagri$temp,na.rm = TRUE) # armazenando os quartis
abline(quartis [[2]],0,col="green1") # plotando o 2.0 quartil
abline(quartis [[4]],0,col="green1") # plotando o 4.0 quartil
amplitude <- quartis [[4]]- quartis [[2]] # calculando a amplitude
limsup <- mean(cepagri$temp,na.rm = TRUE) + 1.5 * amplitude #interpolacao para encontrar limites
liminf <- mean(cepagri$temp, na.rm = TRUE) - 1.5 * amplitude #interpolacao para encontrar limites
abline(limsup, 0,col="red3") # plotando o limite superior
abline(liminf,0,col="red3") # plotando o limite inferior

```

