datascince_algebra_04_r1.R

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```
rm(list=ls())
x<-c(0.3,2.7,4.5,5.9,7.8)
y<-c(1.8,1.9,3.1,3.9,3.3)

plot(x,y,main="Gráfico de dispersão",xlab="X ",
                                     ylab="Y ",
                                     pch=19,
                                     col="blue")

grid(nx = NULL, ny = NULL, col = "grey", lty = "dotted")

### Modelo 01 - Reta u
u<-y[1]+(y[5]-y[1])*(x-x[1])/(x[5]-x[1])
regU<-lm(u ~ x)
a_u=regU$coefficients[1]
b_u=regU$coefficients[2]
abline(a_u,b_u,col="red")
d1<-(y-u)^2
sum_d1<-sum(d1)

### Modelo 02 - Reta w
# x1=2 x5=6
# y1=2 y5=3
w<-2+(3-2)*(x-2)/(6-2)
regW<-lm(w ~ x)
a_w=regW$coefficients[1]
b_w=regW$coefficients[2]
abline(a_w,b_w,col="green")
d2<-(y-w)^2
sum_d2<-sum(d2)

### Modelo 03 - Reta z
n<-length(x)
num<-sum(x)*sum(y)-n*sum(x*y)
den<-(sum(x))^2-n*sum(x^2)
b1<-num/den
b0<-(sum(y)-b1*sum(x))/n

print("b1=")
```

```
## [1] "b1="
```

```
print(b1)
```

```
## [1] 0.2698251
```

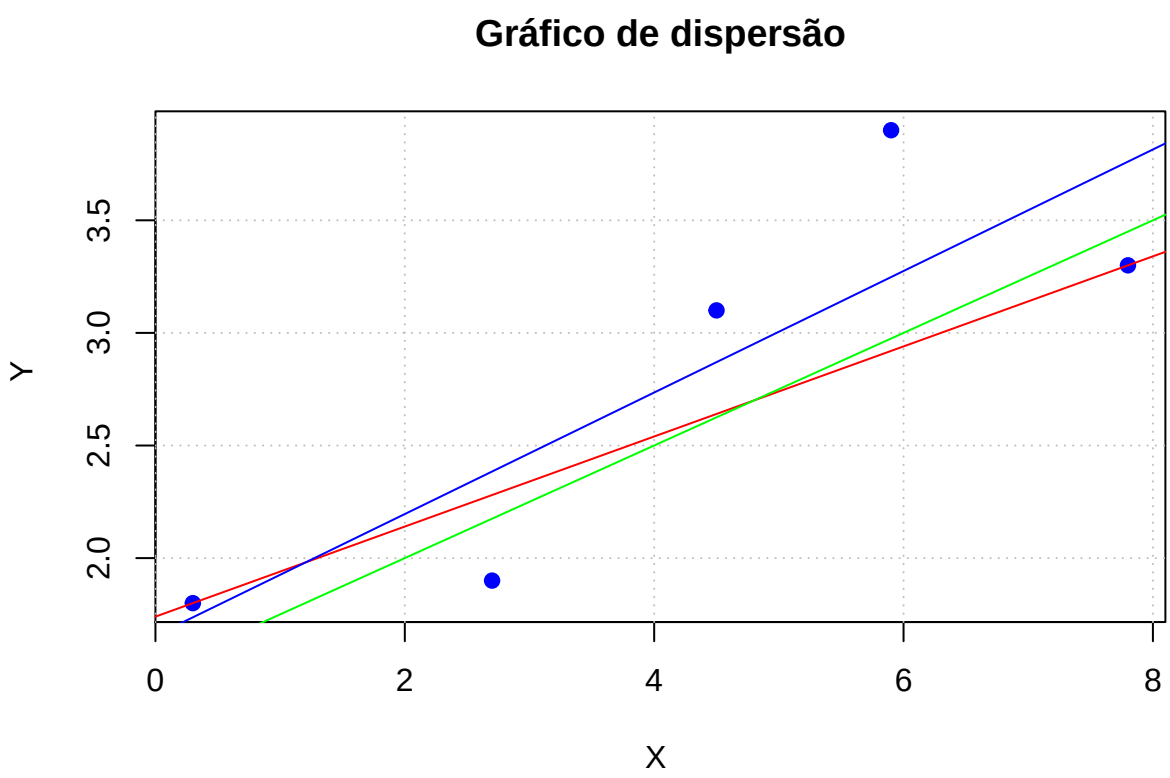
```
print("b0=")
```

```
## [1] "b0="
```

```
print(b0)
```

```
## [1] 1.655942
```

```
abline(b0,b1,col="blue")
```




```
z<-b0+b1*x
d3<-(y-z)^2
sum_d3<-sum(d3)

df<-data.frame(x,y,u,w,z,d1,d2,d3)
print(df)
```

```
##     x   y    u     w        z     d1       d2          d3
## 1 0.3 1.8 1.80 1.575 1.736889 0.0000 0.050625 0.003982989
## 2 2.7 1.9 2.28 2.175 2.384469 0.1444 0.075625 0.234710536
## 3 4.5 3.1 2.64 2.625 2.870155 0.2116 0.225625 0.052828941
## 4 5.9 3.9 2.92 2.975 3.247910 0.9604 0.855625 0.425221787
## 5 7.8 3.3 3.30 3.450 3.760577 0.0000 0.022500 0.212131526
```

```
rotulos <-c("desvio 01","desvio 02","desvio 03")
valores <-c(sum_d1,sum_d2,sum_d3)

resultado<-data.frame(rotulos,valores)
print(resultado)
```

```
##     rotulos   valores
## 1 desvio 01 1.3164000
## 2 desvio 02 1.2300000
## 3 desvio 03 0.9288758
```

```r
### Modelo de regressão linear
regZ<-lm(y ~ x)
print(regZ)
```

```
##
## Call:
## lm(formula = y ~ x)
##
## Coefficients:
## (Intercept)            x
##      1.6559       0.2698
```