

Midterm Q2

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3/7/2022

2. Scatterplots

- a. Obtain and show the scatterplot matrix of all the variables in Affairs with gender the first variable, children the second variable, and affairs variable as the last variable. Do you think this graph is very using for this particular data?

```
library(AER)
```

```
## Loading required package: car
```

```
## Loading required package: carData
```

```
## Loading required package: lmttest
```

```
## Loading required package: zoo
```

```
##  
## Attaching package: 'zoo'
```

```
## The following objects are masked from 'package:base':  
##  
## as.Date, as.Date.numeric
```

```
## Loading required package: sandwich
```

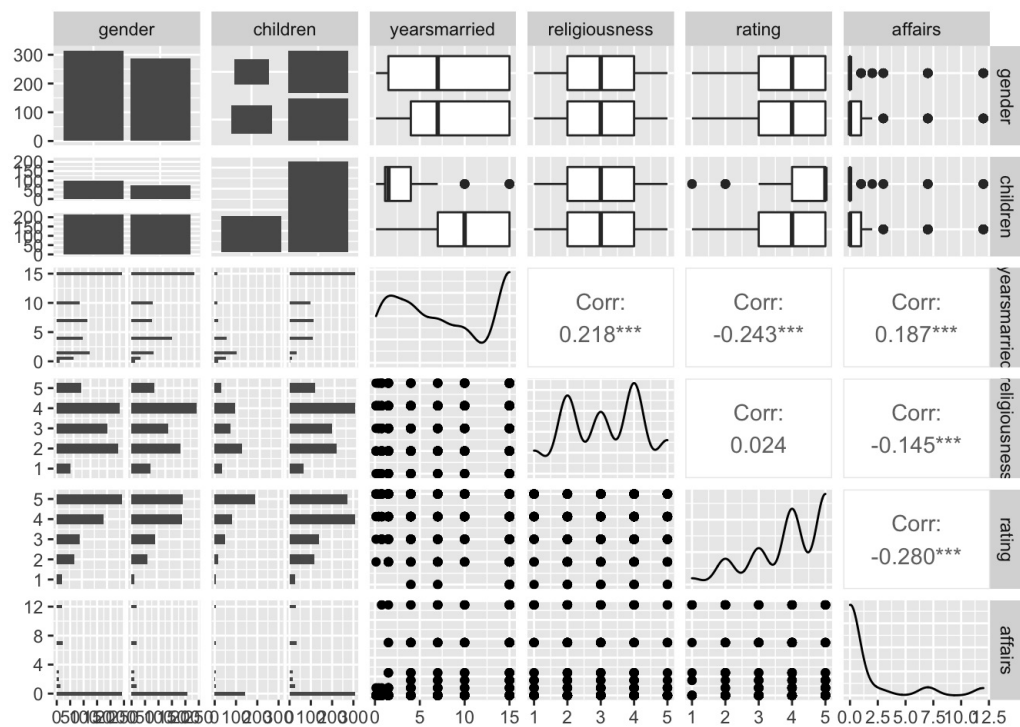
```
## Loading required package: survival
```

```
data(Affairs)  
library(GGally)
```

```
## Loading required package: ggplot2
```

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

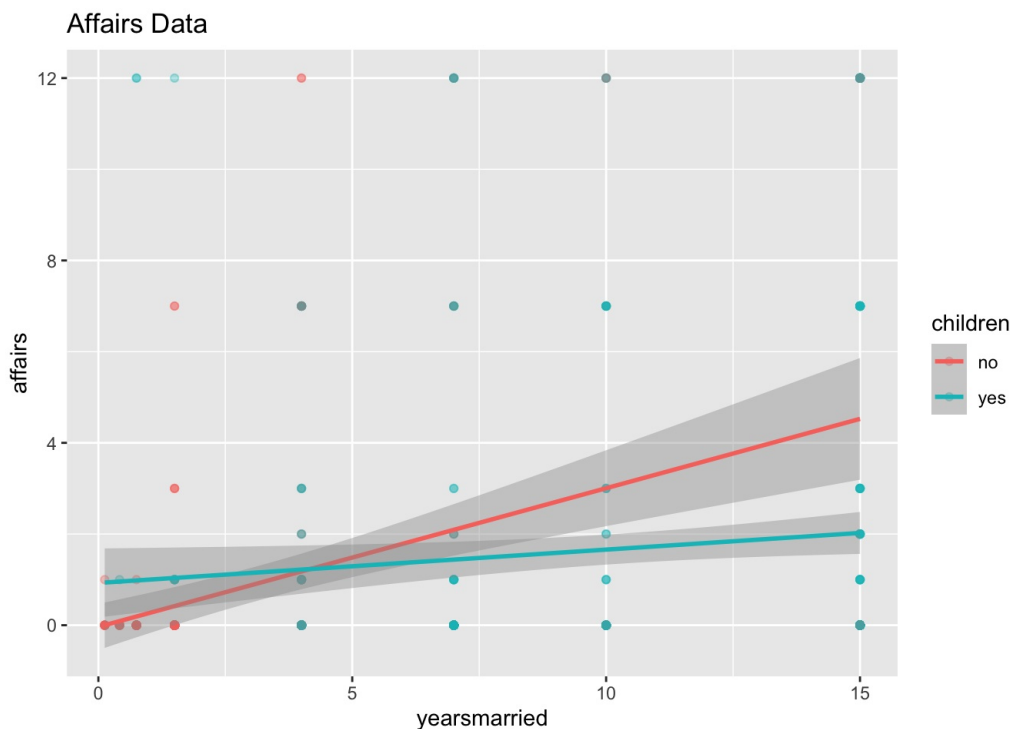
```
  sink( type="message")  
ggpairs(Affairs, columns=c("gender",  
                           "children",  
                           "yearsmarried",  
                           "religiousness",  
                           "rating",  
                           "affairs"), lower=list(combo=wrap("facethist",  
binwidth=0.5))  
)
```



b. Obtain the scatterplot affairs vs

yearsmarried with color of points according to the levels of children. Add regression and loess lines for each group. What sort of relation does this plot reveal?

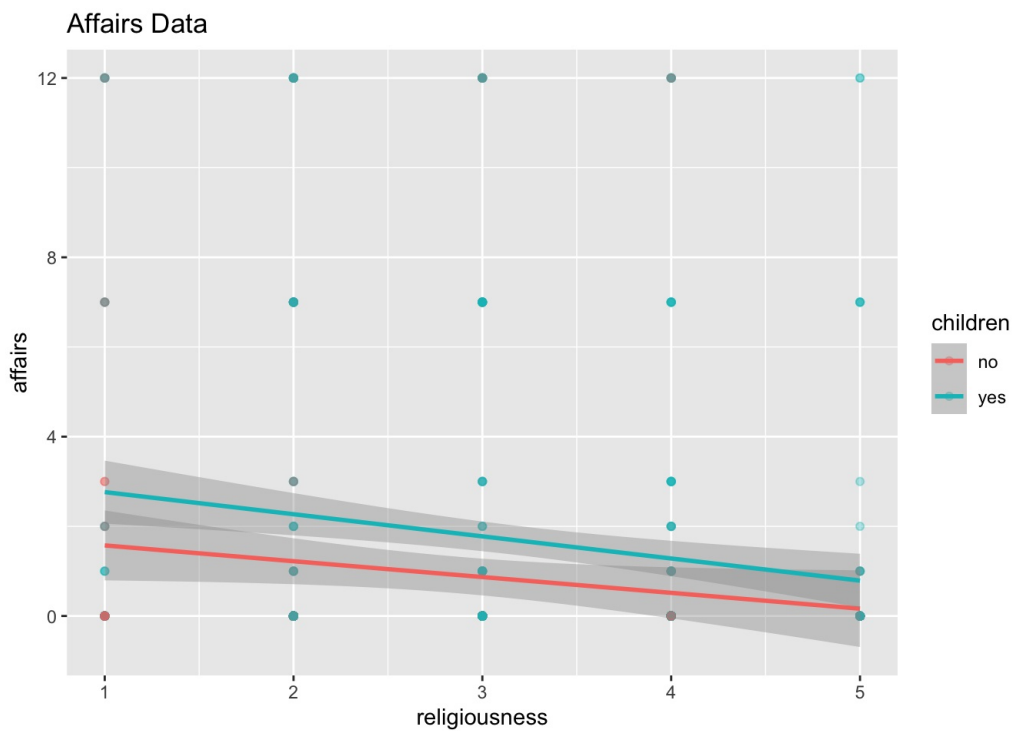
```
library(ggplot2)
A_ym<-ggplot(Affairs, aes(x=yearsmarried, y=affairs,
                           color=children))
A_ym+ geom_point(alpha=I(1/3))+
geom_smooth(formula= y~x,method="lm")+
labs(title= "Affairs Data")
```



The plot reveals the increase of affairs with the increased yearsmarried.
The plot reveals the increase of affairs with no children.

c. Obtain the scatterplot affairs vs religiousness with color of points according to the levels of children. Add regression and loess lines for each group. What sort of relation does this plot reveal?

```
library(ggplot2)
A_r<-ggplot(Affairs, aes(x=religiousness, y=affairs,
                           color=children))
A_r+ geom_point(alpha=I(1/3))+
geom_smooth(formula=y~x,method="lm")+
labs(title= "Affairs Data")
```



The plot reveals affairs decrease with religiousness.
 # Not much difference with children

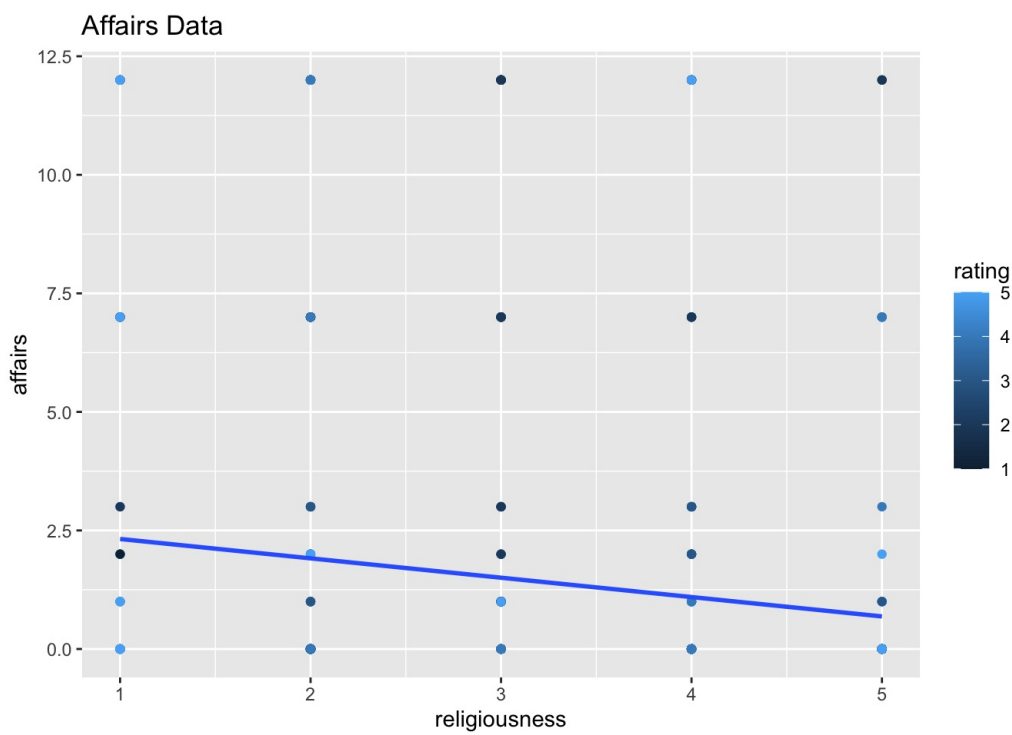
d. Using `as.factor(rating)`, obtain the scatterplot affairs vs religiousness with color of points according to the levels of rating. Add only regression lines for each group. What sort of relation does this plot reveal?

```
as.factor(Affairs$rating)
```

```
## [1] 4 4 4 5 3 5 3 4 2 5 2 4 4 4 4 5 3 4 5 5 5 4 5 4 5 5 4 5 4 3 5 4 4 3 4
## [38] 5 5 5 5 3 4 1 3 5 5 4 5 4 5 4 5 1 4 5 4 4 2 4 5 5 4 5 4 5 5 4 5 5 3
## [75] 5 5 5 5 5 2 5 5 4 3 5 4 5 2 5 4 4 3 4 3 4 5 1 4 5 5 5 4 5 5 4 4 4 3 4 5
## [112] 5 5 4 4 5 2 4 5 4 5 4 3 2 5 5 5 5 5 3 5 5 3 3 4 5 4 5 4 4 3 4 3 4 4 3
## [149] 4 4 3 3 3 3 3 3 1 2 3 5 5 5 5 4 4 2 2 4 4 2 5 5 5 4 5 2 4 4 3 4 2 5 3 5 5
## [186] 5 5 5 5 5 5 4 4 4 3 4 3 5 2 5 5 5 5 3 2 3 2 5 4 3 3 5 2 5 5 5 3 4 5 3 5
## [223] 5 4 4 5 4 4 5 5 4 5 5 4 5 3 5 5 5 4 4 4 5 5 4 4 3 5 4 4 3 4 5 4 5 4 4
## [260] 5 5 3 4 5 3 5 1 5 5 5 5 5 3 3 4 1 3 5 4 5 4 4 4 3 4 2 5 2 2 4 4 5 4 3 5 3
## [297] 5 5 3 4 2 5 4 5 4 4 5 3 3 5 2 5 5 4 3 5 5 4 4 4 5 5 4 5 5 5 4 5 5 3 4 4 4
## [334] 5 5 2 5 5 5 5 5 3 4 5 4 4 5 3 3 2 5 5 4 5 5 3 5 3 5 4 5 5 5 4 5 5 5 4 4
## [371] 2 2 5 3 5 4 5 4 5 5 5 5 5 4 2 5 4 4 5 4 2 2 2 5 5 5 5 3 5 5 4 3 1 5 4
## [408] 5 4 5 3 5 3 4 5 3 5 3 5 5 5 4 1 4 4 5 5 4 3 4 4 5 4 5 2 4 4 4 3 2 3 5 4 5
## [445] 4 5 5 4 2 4 4 4 5 2 2 5 5 2 4 4 2 2 4 1 2 2 5 3 5 5 5 4 4 4 2 4 3 2 4 3 4
## [482] 2 5 5 4 4 3 5 4 3 3 5 4 2 5 5 1 4 5 4 4 4 4 5 3 3 4 4 1 2 4 4 4 2 4 4 2
## [519] 3 1 4 3 2 5 4 5 3 5 3 4 2 4 3 3 3 5 2 3 2 4 3 4 3 5 2 3 1 2 4 2 1 5 4 3 3
## [556] 2 4 4 2 3 1 5 2 4 5 5 3 5 5 4 1 5 4 5 4 2 4 4 2 3 4 3 4 3 2 5 5 5 4 2 2 2
## [593] 2 4 3 2 5 4 5 2 5
## Levels: 1 2 3 4 5
```

```
library(ggplot2)
A_r<-ggplot(Affairs, aes(x=religiousness, y=affairs,
  color=rating))
A_r+ geom_point()+
  geom_smooth(method="lm",se=FALSE)+
  labs(title= "Affairs Data")
```

```
## `geom_smooth()` using formula 'y ~ x'
```



Decreased affairs with religiousness

e. Obtain side-by-side boxplots of all the scaled numeric variables.

```
s=scale(Affairs[sapply(Affairs,is.numeric)])
boxplot(s, xlab = "Scaled Numerical variables", ylab = "affairs", main = "Affairs Data")
```

