Tulot ja koulutus

November 12, 2022

0.1 Tulot ja koulutus

[2]:
```
library(readxl)
library(ggplot2)
```

[14]:
```
data = read_xlsx("~/Documents/Datasets/education.xlsx")
df = data.frame(data)
df = na.omit(df)
attach(df)
head(df)
```

A data.frame: 6 × 4

	age <dbl>	gndr <chr>	earnings <dbl>	education <dbl>
1	30	male	34.61538	160
2	30	female	19.23077	160
3	30	female	13.73626	120
4	30	female	13.94231	130
5	30	female	19.23077	160
6	30	female	8.00000	120

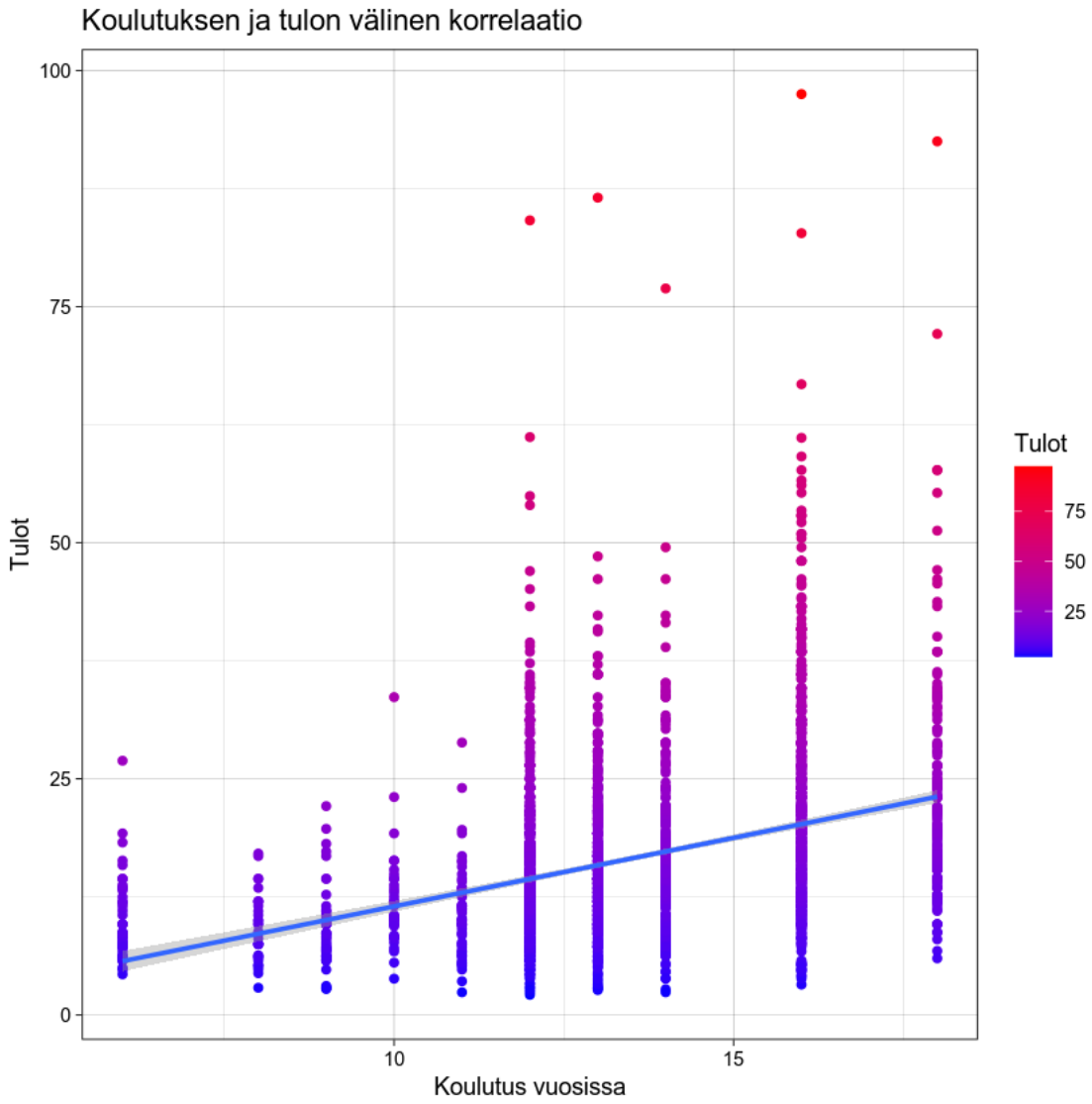
[18]:
```
#Putsataan dataa

#Koulutus vuosissa on ilmoitettu kymmenkertaisena
df$education = df$education/10

#Muutetaan sarakkeiden nimet
colnames(df) = c("age","gender","earnings","education")

#Korjataan yksi ikä-muuttujan arvo
df["age"][df["age"] == "72"] <- "30"

education = df
head(df)
```

A data.frame: 6 × 4

	age <chr>	gender <chr>	earnings <dbl>	education <dbl>
1	30	male	34.61538	16
2	30	female	19.23077	16
3	30	female	13.73626	12
4	30	female	13.94231	13
5	30	female	19.23077	16
6	30	female	8.00000	12

[23]:
```
edu =ggplot(df, aes(x=education,y=earnings, col=earnings)) +
     geom_point() +
     geom_smooth(method="lm")+
     xlab("Koulutus vuosissa") +
     ylab("Tulot") +
     labs(title="Koulutuksen ja tulon välinen korrelaatio",
          col = "Tulot",
          size="") +
     scale_color_gradient(low="blue", high="red") +
     theme_linedraw()

edu
```

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

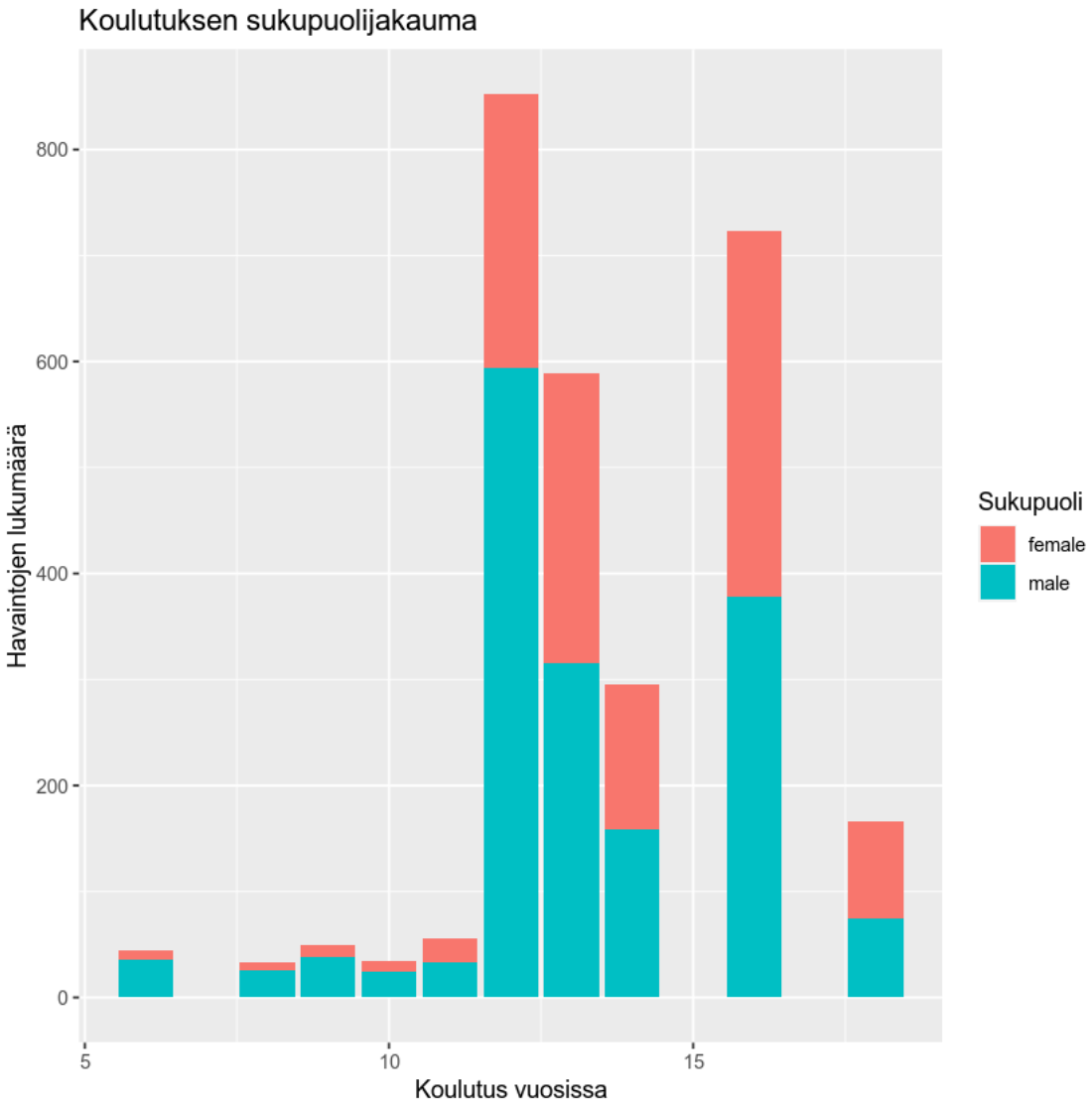


[21]:
```
#Tarkastellaan regressiosovitetta
reg = lm(earnings~education,df)
summary(reg)
```

```
Call:
lm(formula = earnings ~ education, data = df)

Residuals:
    Min      1Q  Median      3Q     Max
-17.115  -5.274  -1.437   3.259  77.287

Coefficients:
```

```
             Estimate Std. Error t value Pr(>|t|)
(Intercept) -3.00475    0.95789  -3.137  0.00173 **
education    1.45110    0.06969  20.823  < 2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 8.604 on 2839 degrees of freedom
Multiple R-squared:  0.1325,        Adjusted R-squared:  0.1322
F-statistic: 433.6 on 1 and 2839 DF,  p-value: < 2.2e-16
```

[28]:
```
edu2 =ggplot(df, aes(x=education,fill=gender)) +
      geom_bar() +
      xlab("Koulutus vuosissa") +
      ylab("Havaintojen lukumäärä") +
      labs(title="Koulutuksen sukupuolijakauma",
          fill="Sukupuoli",
          )
edu2
```


Koulutuksen sukupuolijakauma
Havaintojen lukumäärä
800
600
400
200
0
5
10
15
Koulutus vuosissa
Sukupuoli
female
male