

Task C

- Relationship between mean age of children in a family and height of Christmas tree was studied. The resulting data were following:

Tree height	Age
2,2	3,5
3,1	4,2
0,8	15,8
2,5	7,6
1,4	12,8
1,7	16,4
1,2	15,3
2,8	6,5
0,9	19,5
1,6	5,6

- Does the age of children in family affect the height of the Christmas tree bought by the parents?

Null hypothesis

- There is no correlation between the height of Christmas tree and the age of the children.

R script

- `tree<-read.delim2("clipboard")`
- `cor.test(tree$tree.height, tree$age)`
- `lm.c<-lm(tree$tree.height~tree$age)`
- `summary(lm.c)`
- `ggplot(data=tree, aes(x=age, y=tree.height))+geom_point()+`
- `geom_smooth(method="lm", color=1)+`
- `labs(x="Age", y="Tree height")+theme_classic()`

Results

- Pearson's product-moment correlation
- data: tree\$tree.height and tree\$age
- $t = -3.8541$, $df = 8$, **p-value = 0.004849**
- alternative hypothesis: true correlation is not equal to 0
- 95 percent confidence interval:
- -0.9523889 -0.3585995
- sample estimates:
- cor
- **-0.8061992**

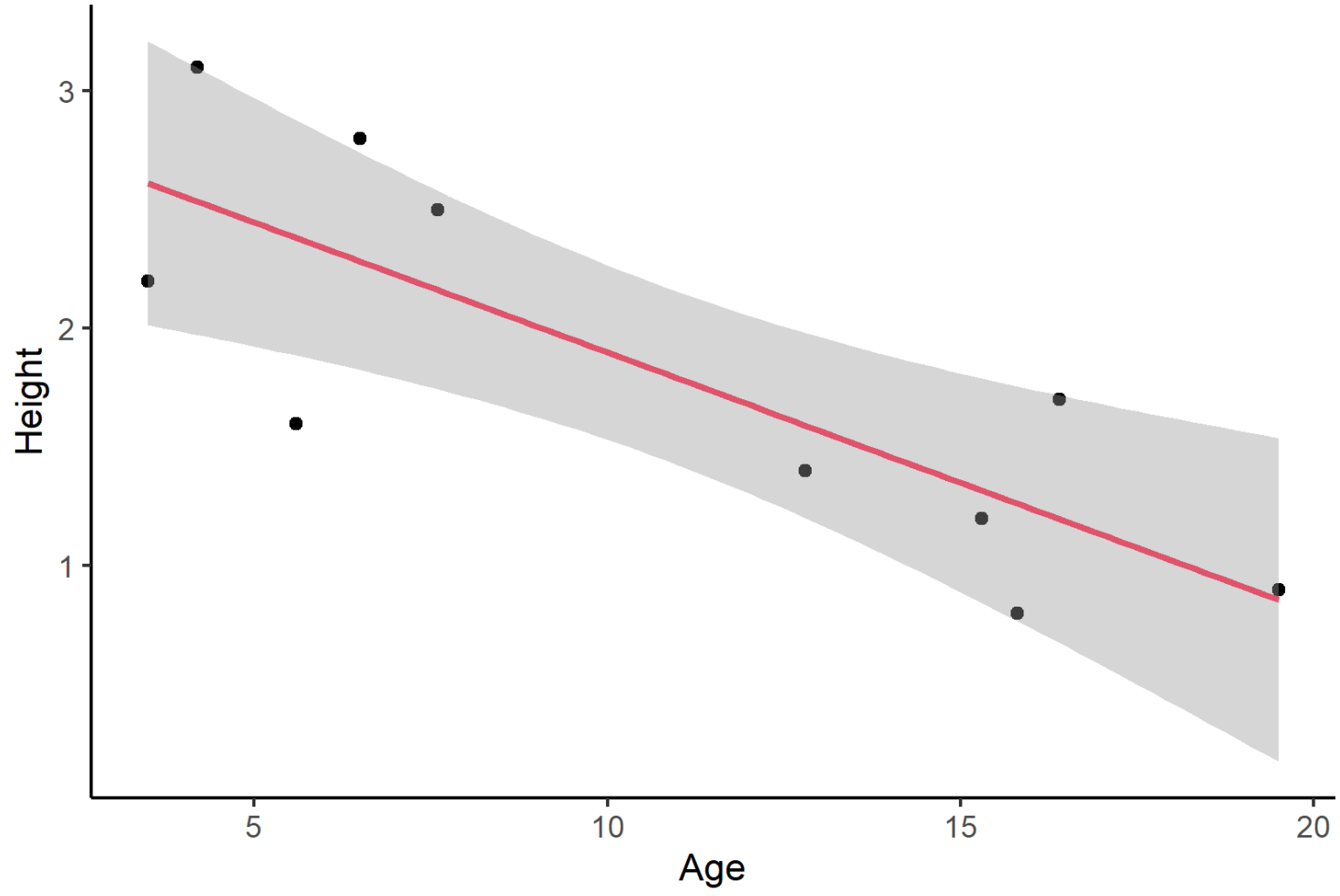
Results

- Call:
- `lm(formula = tree$tree.height ~ tree$age)`

- Residuals:
- Min 1Q Median 3Q Max
- -0.78154 -0.35686 -0.03737 0.46167 0.56491

- Coefficients:
- Estimate Std. Error t value Pr(>|t|)
- (Intercept) 2.99572 0.34361 8.718 2.34e-05 ***
- tree\$age -0.10968 0.02846 -3.854 0.00485 **
- ---
- Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

- Residual standard error: 0.5001 on 8 degrees of freedom
- Multiple R-squared: 0.65, Adjusted R-squared: 0.6062
- F-statistic: 14.85 on 1 and 8 DF, p-value: 0.004849



Conclusion

- There is a negative linear regression between the age of children and the tree height.