



TALLINN UNIVERSITY OF TECHNOLOGY
SCHOOL OF ENGINEERING
Laboratory of Wood Technology

MATERIALS TESTING METHODS EKX0350

R CODING PRACTICAL WORK

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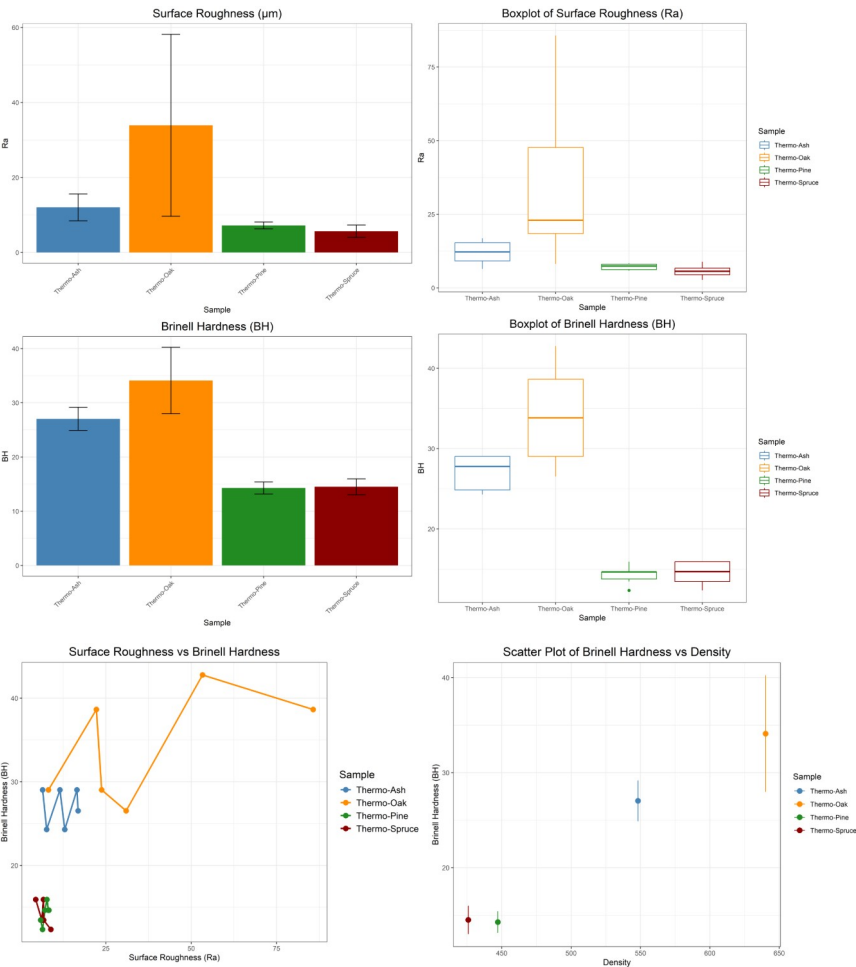
Tallinn 2025

1. R coding task

1. Install R software from here: <https://cran.rstudio.com/>
2. Install RStudio from here: <https://posit.co/download/rstudio-desktop/>
3. Open RStudio and import Excel file "Exercise.xlsx"
4. Make 4 different graphs in R:
 - a. **Bar chart** – load the Barchart tab from the Excel file and make the 2 separate bar charts with error bars using the font Times New Roman.
 - b. **Line Plot** – load the Line plot tab from the Excel file and make a line plot, where y = Brinell hardness (BH) and x = Surface roughness (Ra). Use font Times New Roman.
 - c. **Boxplot** – load the Boxplot tab from the Excel file and make the 2 separate boxplots, where y = surface roughness (Ra) or Brinell hardness (BH), x = Wood samples, color = Samples. Use text font Calibri and theme black/white and remove any additional background.
 - d. **Scatter plot** – load Scatter tab from the Excel file and make scatter plot, where y = Brinell hardness (BH), x = Density, color = Wood samples. Add error bars to Brinell hardness. Use text font Arial Unicode MS theme black/white and remove any additional background.
5. Make ANOVA and TUKEYHSD statistical analysis.
 - a. Load R statistics tab from the Excel file and make the ANOVA analysis for Surface roughness and Brinell hardness values.
 - b. After ANOVA test, make the TUKEYHSD test with confidence level of 95%.
 - c. Great the groupings of TUKEHSD results
 - d. Export the TUKEYHSD groups in Excel file
6. Add all graphs into this Word Template
7. Add ANOVA and TUKEYHSD groups into this Word Template.

2. R plots

1. Bar chart here / Line plot here / Boxplot here / Scatter plot here



3. R statistics

1. ANOVA results here

Df	Sum Sq	Mean Sq	F value	Pr(>F)
	5147.0361	1715.6787	10.195971	5.3121596
3	556	1853333	7883506	7935664E-05
36	6057.7289	168.27024		
	884	9677778		

2. TUKEYHSD grouping here

diff	lwr	upr	p adj	Comparison
			0.0031158	
21.8932	6.2692207	37.517179	901067853	Thermo-Oak-7 Thermo-Ash
	5080721	2491928		
	-			
-4.8302	20.454179	10.793779	0.8386113	Thermo-Pine-48255834 Thermo-Ash
	2491928	2491928		
	-			
6.37379999	21.997779	9.2501792	0.6925918	Thermo-Spruce-999999 83281475 Thermo-Ash
	2491928	4919279		
	-		0.0002796	
-26.7234	42.347379	11.099420	013427163	Thermo-Pine-18 Thermo-Oak
	2491928	7508072		
	-		0.0001259	
-28.267	43.890979	12.643020	336432992	Thermo-Spruce-7 Thermo-Oak
	2491928	7508072		
	-			
1.54359999	17.167579	14.080379	0.9932888	Thermo-Spruce-72924178 Thermo-Pine
	2491928	2491928		