LAB – Programming with R

LAB ASSIGNMENT   Date: 10.03.2025

1. The last date for submission of the E-record for the assignment is 10ᵗʰ March 2025.
2. Mention the Register Number, Name, Slot details, course code and Course Title on the first page of the document.

Assignment No. 3

1. The viscosity of two different brands of car oil is measured and the following data resulted:

Brand 1	10.62	10.58	10.33	10.72	10.44	10.74	
Brand 2	10.50	10.52	10.58	10.62	10.55	10.51	10.53

Test the hypothesis at $\alpha = 0.05$ & 0.01 that the mean viscosity of the two brands is equal, assume that the two populations are normal distributed with equal variances.

2. A college prep program compared the practice SAT scores (math and reading combined) given before and after an eight-week instruction for each student. The scores are given below:

Student SAT Score									
	1	2	3	4	5	6	7	8	9
Before	1280	1200	1050	1190	1250	1290	1220	1270	1260
After	1380	1310	1090	1240	1290	1360	1270	1330	1310

Test if the average score has been raised by 50 points using $\alpha = 0.05$ & 0.10.

3. Fifteen fishes were caught at one coast and twenty on another coast. Their length was measured in centimetres. The measurements were as displayed below:

Coast 1: 18.8 20.5 20.0 21.0 17.8 18.2 17.8 19.5 20.0 18.2 18.4
19.8 19.8 20.3 19.0

Coast 2: 19.8 21.0 20.0 19.5 18.9 18.0 18.5 18.2 20.2 19.0 19.2
20.2 19.2 17.0 18.8 17.6 18.3 19.6 20.2 18.4

An investigator is interested in testing whether the variability in fish size at two coasts is the same. Test the significance at 1% and 5% level of significance.

4. A company operates four machines three shifts each day. From production records, the following data on the number of breakdowns are collected:

	Machines			
	A	*B*	*C*	*D*
1	41	20	12	16
2	31	11	9	14
3	15	17	16	10

Test the hypothesis (using $\alpha = 1\%$ and 5%) that breakdowns are independent of the shift. Find the P-value for this test.

5. Fit a Poisson distribution for the following distribution and also test the goodness of fit at $\alpha = 0.05$.

x	0	1	2	3	4
f	24	30	31	11	6