1. Create the vectors:
(a) (1; 2; 3; : : : ; 19; 20)
(b) (20; 19; : : : ; 2; 1)
(c) (1; 2; 3; : : : ; 19; 20; 19; 18; : : : ; 2; 1)
(d) (4; 6; 3) and assign it to the name tmp.

The following data gives, for each amount by which an elastic band is stretched over the end of a ruler, the distance that the band moved when released:

stretch	46	54	48	50	44	42	52
distance	148	182	173	166	109	141	166

Enter the data into R and plot **distance** against **stretch**.

2. Generate the following
(a) (4; 6; 3; 4; 6; 3; : : : ; 4; 6; 3) where there are 10 occurrences of 4.
(b) (4; 6; 3; 4; 6; 3; : : : ; 4; 6; 3; 4) where there are 11 occurrences of 4, 10 occurrences of 6 and 10 occurrences of 3.
(c) (4; 4; : : : ; 4; 6; 6; : : : ; 6; 3; 3; : : : ; 3) where there are 10 occurrences of 4, 20 occurrences of 6 and 30 occurrences of 3.

Considering the data from ***"cars***" do the following
(d) Correlation and Covariance
(e) Explain in words correlation and covariance significance obtained
(f) Linear regression to estimate the relationship and give the summary report
(g) Graph

3. Create the file with the following data
Morphometric measurements of eight birds. The symbol NA stands for a missing value. The measured variables are the lengths of the wing (measured as the wing chord), leg (a standard measure of the tarsus), head (from the bill tip to the back of the skull), and weight.

Wingcrd	Tarsus	Head	Wt
59	22.3	31.2	9.5
55	19.7	30.4	13.8
53.5	20.8	30.6	14.8
55	20.3	30.3	15.2
52.5	20.8	30.3	15.5
57.5	21.5	30.8	15.6
53	20.6	32.5	15.6
55	21.5	NA	15.7

Generate the following graphs and give your interpretation
(a) Histogram
(b) Line
(c) Box
(d) Scatter
(e) Bar

4. The data set iris contains measurements of the length and the width (in cm) of petals and sepals of three iris species: 1: Setosa, 2: Versicolor and 3: Virginica.

(a) For the variable ***Sepal_Length*** check the following results by using the R-functions Minimum, Maximum, Mean, Median, Satandard deviation, Quartile, summary
(b) Give Graphical summaries using Simple data plot and Histograms
(c) Give Correlation and Covariance summaries

Generate the following vectors

(a) 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0
(b) 1 1 1 1 1 1 2 2 2 2 2 2 3 3 3 3 3 3

5. Use R to perform the following operations on the following data set

```
mlu <- data.frame(age= seq (25,48)
chi=c(1.46, 1.41, 1.66, 1.74, 1.90, 1.91, 1.85, 2.06,  2.27, 2.43, 2.70, 2.81, 2.69, 2.72, 2.64, 3.05,
   3.22, 3.42, 3.70, 3.90, 3.57, 3.49, 3.66, 3.64),
mot=c(5.42, 5.69, 6.27, 6.10, 6.06, 5.98, 6.10, 6.09,  6.10, 6.14, 6.42, 6.35, 6.21, 6.07, 5.84, 6.17,
   5.74, 6.11, 6.41, 5.50, 6.00, 6.90, 6.65, 6.40))
```

(a) Create and import the data set
(b) Perform Initial Data Analysis : min, max , Average of each variable
(c) Numerical summaries: Corr. and Cov.
(d) Explain in words correlation and covariance significance obtained
(e) Graphical summaries: Simple data plot and Histograms

6.

	height	shoesize	gender	population
1	181	44	male	kuopio
2	160	38	female	kuopio
3	174	42	female	kuopio
4	170	43	male	kuopio
5	172	43	male	kuopio
6	165	39	female	kuopio
7	161	38	female	kuopio
8	167	38	female	tampere
9	164	39	female	tampere
10	166	38	female	tampere
11	162	37	female	tampere
12	158	36	female	tampere
13	175	42	male	tampere
14	181	44	male	tampere
15	180	43	male	tampere
16	177	43	male	tampere
17	173	41	male	tampere

(a) print the column headers only
(b) What is mean height and shoesize? What is the standard deviation
(c) What are the gender and sampling site distribution (how many observations are in each groups)?
(d) How are heights distributed? Use histogram
(e) For the variable height which is divided into two groups generate separate boxplot

7.	Use the rep function to define the following vectors in R. (a) 6,6,6,6,6,6 (b) 5,8,5,8,5,8,5,8 (c) 5,5,5,5,8,8,8,8 The following data gives milk volume (g/day) for smoking and nonsmoking mothers 25: Smoking Mothers: 621, 793, 593, 545, 753, 655, 895, 767, 714, 598, 693 Nonsmoking Mothers: 947, 945, 1086, 1202, 973, 981, 930, 745, 903, 899, 961 Present the data in R Generate side by side boxplots Use a dotplot form of display.