

# CSE214 – Statistical Programming

## Project-2

Due Date: 30.04.2024

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### General Description

You can work by yourself or in the group that was created for the first project.

Please use “**DatasetNA.txt**” to answer the questions below. The file of “DatasetNA.txt” includes 100 observations from 11 variables:

**IdNo**: Id numbers of individuals in the sample

**Group**: categorical variable with 4 levels (Group1, Group2, Group3 and Group4)

**Gender**: categorical variable with 2 levels (Male and Female)

**Var1, Var2, Var3, Var4, Var5, Var6, Var7 and Var8**: continuous variables.

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### Questions

In order to answer each question, please WRITE YOUR OWN FUNCTION USING R-PROJECT, hand in the r functions and outputs and be aware of missing observations in “DatasetNA.txt”.

#### 1. Calculate

- Number of observations,
- Minimum,
- Maximum,
- Range,
- Sum,
- Mean,
- Median,
- Sum of squares,
- Variance,
- Standard deviation

for **Var1, Var2, Var3, Var4, Var5, Var6, Var7 and Var8** continuous variables and calculate

- Cross-products,
- Covariance
- Correlations

between variables by writing your own function in R.

#### 2. Calculate

- Number of observations,
- Minimum,
- Maximum,
- Range,
- Sum,
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- Median,
- Sum of squares,
- Variance,
- Standard deviation

for **Var1, Var2, Var3, Var4, Var5, Var6, Var7** and **Var8** continuous variables **by only factor of group, only factor of gender and group by gender factor combination** and calculate

- Cross-products,
- Covariance
- Correlations

between variables **by only factor of group, only factor of gender and group by gender factor combination** by writing your own function in R.

3. Please write your own function to draw **scatterplot** between two variables and to draw **scatterplot-matrix** among variables in a data frame

4. Please write your own function to **scale** a variable or variables in a data frame

Dataset : "DatasetNA.txt"

IdNo	Group	Gender	Var1	Var2	Var3	Var4	Var5	Var6	Var7	Var8
1	Group3	Male	3,77	22,11	67,21	79,58	78,27	76,47	89,59	15,51
2	Group2	Female	3,76	19,88	61,10	71,23	70,83	76,13	88,71	15,52
3	Group1	Female	3,96	22,36	59,89	71,44	71,52	73,62	88,33	15,61
4	Group2	Female	3,92	19,04	61,00	70,36	72,31	72,09	87,51	15,57
5	Group2	Female	4,13	22,97	60,89	69,12	70,59	69,06	88,76	16,58
6	Group1	Female	3,64	18,45	57,87	67,29	66,96	67,41	86,54	14,33
7	Group3	Female	4,36	22,45	62,42	74,30	73,10	73,91	89,07	17,26
8	Group1	Female	3,99	18,39	60,64	70,71	71,56	71,26	88,85	14,83
9	Group1	Male	3,93	19,59	57,74	65,62	65,89	68,42	88,55	16,57
10	Group3	Male	3,89	21,49	63,99	73,61	74,28	73,19	86,95	14,64
11	Group3	Male	4,38	22,70	62,67	74,27	72,60	72,52	90,32	15,89
12	Group2	Male	3,86	21,16	60,75	68,79	72,07	69,88	89,15	14,35
13	Group3	Male	4,02	NA	62,96	71,35	72,39	75,21	89,63	15,41
14	Group3	Male	3,92	20,93	63,36	72,86	76,20	75,75	89,14	15,34
15	Group4	Female	4,55	24,67	66,19	78,91	78,88	77,81	87,96	15,72
16	Group1	Male	3,75	17,06	59,88	68,95	69,50	70,04	88,45	14,69
17	Group1	Male	3,98	19,16	60,08	71,06	71,67	70,92	87,37	16,53
18	Group3	Male	3,21	17,98	64,96	76,02	77,47	76,76	89,09	14,74
19	Group4	Female	4,27	23,19	64,51	75,38	75,61	76,42	89,77	16,09
20	Group3	Male	3,79	20,95	NA	72,67	75,93	74,80	88,23	15,02
21	Group3	Male	4,53	25,04	63,71	73,80	77,38	77,49	88,55	17,51
22	Group3	Male	4,05	21,06	62,71	74,14	73,92	76,86	88,84	15,45
23	Group2	Male	3,92	21,05	61,41	72,02	72,14	71,68	90,65	15,18

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24	Group3	Male	4,28	24,38	66,81	78,17	79,04	78,81	91,64	16,74
25	Group2	Female	3,79	20,20	61,02	71,42	NA	75,18	87,60	15,30
26	Group2	Female	4,80	22,31	61,60	72,73	73,15	67,66	88,16	16,23
27	Group2	Female	4,07	23,54	61,80	74,75	71,48	68,48	89,60	16,10
28	Group3	Male	3,79	22,72	63,69	72,58	75,34	76,12	90,24	16,25
29	Group1	Female	4,13	22,39	60,03	70,19	71,22	66,94	89,03	16,38
30	Group2	Female	4,11	23,97	60,80	71,24	71,33	73,93	87,72	15,80
31	Group3	Male	3,73	21,31	64,66	74,71	74,77	79,78	90,28	15,46
32	Group1	Male	3,90	17,49	55,68	66,30	66,59	65,43	85,25	15,33
33	Group4	Male	4,31	24,02	64,77	75,40	75,25	74,43	90,72	15,69
34	Group3	Female	4,05	21,61	62,06	71,99	73,60	67,26	89,29	15,70
35	Group4	Female	4,01	18,13	64,76	74,57	76,51	75,11	90,05	16,12
36	Group3	Male	3,70	17,26	63,82	73,35	75,34	73,22	90,14	16,23
37	Group1	Male	4,11	20,06	60,09	70,29	71,74	71,52	87,00	15,97
38	Group2	Male	3,75	20,90	61,50	71,47	72,02	73,62	89,72	14,68
39	Group1	Male	4,11	21,55	56,15	67,88	70,40	68,05	86,84	14,58
40	Group2	Male	4,03	22,55	61,78	74,41	72,20	70,34	87,32	14,28
41	Group4	Female	3,76	22,49	64,21	74,03	74,14	68,70	90,23	14,26
42	Group1	Male	3,39	20,62	60,70	70,37	71,12	71,46	88,35	15,79
43	Group1	Male	3,78	16,16	57,91	67,13	69,17	69,76	88,37	14,22
44	Group3	Female	4,11	20,76	62,93	72,25	73,95	71,01	88,82	NA
45	Group1	Male	4,52	20,07	60,80	71,69	72,07	70,02	87,35	15,17
46	Group4	Female	3,94	22,45	64,41	75,36	74,67	76,88	91,82	16,46
47	Group1	Female	3,70	20,55	59,34	69,53	70,38	67,65	86,22	17,01
48	Group1	Male	3,61	18,67	55,85	66,98	70,69	67,30	85,82	16,03
49	Group2	Male	3,70	20,98	60,73	69,36	72,77	68,31	88,76	13,89
50	Group1	Female	3,83	18,10	60,17	69,78	69,72	68,30	87,19	18,03
51	Group2	Female	4,53	21,76	61,36	72,77	71,94	71,92	86,70	16,65
52	Group3	Male	3,84	19,28	62,32	71,78	72,53	70,30	89,73	15,97
53	Group1	Female	3,74	19,75	61,64	72,67	72,45	66,80	89,30	15,60
54	Group4	Male	4,01	21,08	65,30	75,36	76,97	79,11	89,18	15,22
55	Group1	Male	3,94	21,96	59,31	68,41	71,11	69,44	87,01	14,44
56	Group2	Female	3,67	21,63	61,42	71,16	72,03	71,48	88,52	16,49
57	Group3	Female	4,07	22,03	NA	73,62	73,24	NA	88,74	15,10
58	Group4	Male	4,11	21,80	65,55	76,23	77,37	78,35	90,05	16,75
59	Group3	Female	4,67	22,74	62,43	72,46	74,92	71,15	90,77	15,49
60	Group4	Female	4,36	21,87	65,40	77,07	78,64	75,81	86,81	16,89
61	Group1	Female	4,08	23,55	58,99	69,12	67,49	68,51	87,95	15,29
62	Group2	Male	3,64	18,53	60,71	70,76	71,55	70,58	89,27	15,22
63	Group1	Female	4,14	20,28	61,17	72,25	72,12	67,32	89,46	16,25
64	Group4	Male	4,11	21,91	64,98	74,76	77,47	76,93	87,12	15,80
65	Group4	Female	3,82	22,98	64,30	73,33	76,42	74,86	91,57	16,44
66	Group2	Female	3,74	21,18	61,05	70,48	70,75	70,61	86,88	16,13

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67	Group1	Male	3,93	21,00	57,77	67,66	69,54	65,36	85,54	15,81
68	Group1	Female	4,46	19,08	59,35	69,62	70,63	70,15	85,05	14,52
69	Group3	Male	4,16	25,11	63,38	73,17	73,99	78,58	89,63	15,77
70	Group1	Male	4,47	21,96	61,19	71,28	72,58	71,77	88,90	14,73
71	Group4	Male	4,07	19,12	64,31	75,23	74,23	76,26	90,36	15,09
72	Group1	Male	3,41	18,74	58,15	68,05	69,01	67,72	87,55	15,00
73	Group1	Male	3,76	18,63	59,78	69,92	69,90	70,97	88,78	15,55
74	Group3	Male	3,85	17,72	62,25	71,97	72,52	73,30	88,19	15,99
75	Group4	Female	4,09	19,70	64,23	73,60	75,90	74,65	88,06	14,11
76	Group3	Female	3,91	21,22	63,02	75,81	70,47	74,15	89,76	14,23
77	Group1	Male	4,44	22,14	59,83	69,13	70,56	71,04	85,93	16,69
78	Group4	Female	4,26	21,42	66,01	77,39	78,03	76,30	91,94	15,01
79	Group1	Female	3,71	20,79	61,65	72,07	73,58	73,10	90,03	15,36
80	Group1	Male	3,99	16,52	54,84	65,64	66,34	67,08	87,14	17,18
81	Group2	Male	4,03	19,02	61,67	72,12	73,32	69,36	86,69	16,80
82	Group3	Male	3,68	20,74	63,11	73,45	75,97	74,15	90,96	15,77
83	Group3	Female	4,05	21,30	63,73	73,84	75,49	71,02	89,67	16,33
84	Group3	Female	4,39	24,01	62,05	73,31	72,92	72,72	87,61	15,66
85	Group4	Male	3,65	20,15	62,84	NA	74,41	72,48	89,92	15,52
86	Group3	Female	4,06	23,76	64,11	74,49	75,47	72,26	88,27	16,46
87	Group4	Male	4,24	19,89	64,14	73,85	76,73	71,92	87,92	15,86
88	Group3	Male	3,78	19,58	62,18	73,36	74,00	75,77	87,96	16,09
89	Group4	Male	NA	20,21	64,61	73,20	76,15	74,64	89,49	15,42
90	Group4	Male	4,25	23,25	65,45	78,05	76,93	75,31	88,88	15,84
91	Group3	Female	3,89	19,44	63,03	73,15	74,73	69,59	89,46	14,05
92	Group2	Female	3,79	23,08	60,89	69,91	71,03	74,09	88,43	16,30
93	Group4	Male	3,72	17,02	65,29	76,92	77,66	76,74	90,03	14,67
94	Group4	Male	4,22	23,11	65,45	76,18	77,70	74,63	90,54	16,72
95	Group1	Male	3,87	21,94	59,27	69,66	67,66	67,63	87,27	16,71
96	Group4	Female	3,93	21,51	65,13	76,90	78,17	NA	92,17	16,97
97	Group4	Male	3,80	19,08	65,02	74,82	79,44	74,25	91,15	16,54
98	Group2	Male	4,24	22,39	61,65	71,72	72,38	77,48	89,32	15,40
99	Group2	Male	3,55	22,02	61,36	71,07	73,92	68,22	88,26	17,18
100	Group1	Female	4,14	20,44	58,85	70,08	68,69	65,58	88,06	14,21