

Foundations of Data Analytics Lab 4b

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CODE:

```
# Lab 4b
```

```
# L7+L8
```

```
# Meher Shrishti Nigam
```

```
# CSE AI + Robotics
```

```
# 20BRS1193
```

```
# LAB 4 FDA Lab Experiment-4-b
```

```
# 1. Install the package MASS.
```

```
is_installed <- function(mypkg) is.element(mypkg, installed.packages()[,1])
```

```
# 2. Import the package MASS.
```

```
library(MASS)
```

```
# 3. Display the structure of the data survey.
```

```
data("survey")
```

```
survey
```

```
# 4. Check the class and type of the data set survey in MASS.
```

```
class(survey)
```

```
typeof(survey)
```

```
# 5. Get the number of rows and columns of the survey data frame.
```

```
ncol(survey)
```

```
nrow(survey)
```

```
# 6. Get the dimension of the survey data frame.
```

```
dim(survey)
```

```
# 7. Provide the statistical summary of the data frame.
```

```
summary(survey)
```

```
# 8. Display the column names of the survey data frame
```

```
names(survey)
```

```
# 9. Retrieve the top 3 rows from the data frame.
```

```
head(survey, 3)
```

```
# 10. Extract the bottom 2 rows from the data frame.  
tail(survey, 2)
```

OUTPUT:

```
> # 1. Install the package MASS.
```

```
> is_installed <- function(mypkg) is.element(mypkg, installed.packages()[,1])
```

```
> # 2. Import the package MASS.
```

```
> library(MASS)
```

```
> # 3. Display the structure of the data survey.
```

```
> data("survey")
```

```
> survey
```

	Sex	Wr.Hnd	NW.Hnd	W.Hnd	Fold	Pulse	Clap	Exer	Smoke	Height
1	Female	18.5	18.0	Right	R on L	92	Left	Some	Never	173.00
2	Male	19.5	20.5	Left	R on L	104	Left	None	Regul	177.80
3	Male	18.0	13.3	Right	L on R	87	Neither	None	Occas	NA
4	Male	18.8	18.9	Right	R on L	NA	Neither	None	Never	160.00
5	Male	20.0	20.0	Right	Neither	35	Right	Some	Never	165.00
6	Female	18.0	17.7	Right	L on R	64	Right	Some	Never	172.72
7	Male	17.7	17.7	Right	L on R	83	Right	Freq	Never	182.88
8	Female	17.0	17.3	Right	R on L	74	Right	Freq	Never	157.00
9	Male	20.0	19.5	Right	R on L	72	Right	Some	Never	175.00
10	Male	18.5	18.5	Right	R on L	90	Right	Some	Never	167.00
11	Female	17.0	17.2	Right	L on R	80	Right	Freq	Never	156.20
12	Male	21.0	21.0	Right	R on L	68	Left	Freq	Never	NA
13	Female	16.0	16.0	Right	L on R	NA	Right	Some	Never	155.00
14	Female	19.5	20.2	Right	L on R	66	Neither	Some	Never	155.00
15	Male	16.0	15.5	Right	R on L	60	Right	Some	Never	NA
16	Female	17.5	17.0	Right	R on L	NA	Right	Freq	Never	156.00
17	Female	18.0	18.0	Right	L on R	89	Neither	Freq	Never	157.00
18	Male	19.4	19.2	Left	R on L	74	Right	Some	Never	182.88
19	Male	20.5	20.5	Right	L on R	NA	Left	Some	Never	190.50
20	Male	21.0	20.9	Right	R on L	78	Right	Freq	Never	177.00
21	Male	21.5	22.0	Right	R on L	72	Left	Freq	Never	190.50
22	Male	20.1	20.7	Right	L on R	72	Right	Freq	Never	180.34
23	Male	18.5	18.0	Right	L on R	64	Right	Freq	Never	180.34
24	Male	21.5	21.2	Right	R on L	62	Right	Some	Never	184.00
25	Female	17.0	17.5	Right	R on L	64	Left	Some	Never	NA
26	Male	18.5	18.5	Right	Neither	90	Neither	Some	Never	NA
27	Male	21.0	20.7	Right	R on L	90	Right	Some	Never	172.72
28	Male	20.8	21.4	Right	R on L	62	Neither	Freq	Never	175.26

29	Male	17.8	17.8	Right	L on R	76	Neither	Freq	Never	NA
30	Male	19.5	19.5	Right	L on R	79	Right	Some	Never	167.00
31	Female	18.5	18.0	Right	R on L	76	Right	None	Occas	NA
32	Male	18.8	18.2	Right	L on R	78	Right	Freq	Never	180.00
33	Female	17.1	17.5	Right	R on L	72	Right	Freq	Heavy	166.40
34	Male	20.1	20.0	Right	R on L	70	Right	Some	Never	180.00
35	Male	18.0	19.0	Right	L on R	54	Neither	Some	Regul	NA
36	Male	22.2	21.0	Right	L on R	66	Right	Freq	Occas	190.00
37	Female	16.0	16.5	Right	L on R	NA	Right	Some	Never	168.00
38	Male	19.4	18.5	Right	R on L	72	Neither	Freq	Never	182.50
39	Male	22.0	22.0	Right	R on L	80	Right	Some	Never	185.00
40	Male	19.0	19.0	Right	R on L	NA	Neither	Freq	Occas	171.00
41	Female	17.5	16.0	Right	L on R	NA	Right	Some	Never	169.00
42	Female	17.8	18.0	Right	R on L	72	Right	Some	Never	154.94
43	Male	NA	NA	Right	R on L	60	<NA>	Some	Never	172.00
44	Female	20.1	20.2	Right	L on R	80	Right	Some	Never	176.50
45	Female	13.0	13.0	<NA>	L on R	70	Left	Freq	Never	180.34
46	Male	17.0	17.5	Right	R on L	NA	Neither	Freq	Never	180.34
47	Male	23.2	22.7	Right	L on R	84	Left	Freq	Regul	180.00
48	Male	22.5	23.0	Right	R on L	96	Right	None	Never	170.00
49	Female	18.0	17.6	Right	R on L	60	Right	Some	Occas	168.00
50	Female	18.0	17.9	Right	R on L	50	Left	None	Never	165.00
51	Male	22.0	21.5	Left	R on L	55	Left	Freq	Never	200.00
52	Male	20.5	20.0	Right	L on R	68	Right	Freq	Never	190.00
53	Male	17.0	18.0	Right	L on R	78	Left	Some	Never	170.18
54	Male	20.5	19.5	Right	L on R	56	Right	Freq	Never	179.00
55	Male	22.5	22.5	Right	R on L	65	Right	Freq	Regul	182.00
56	Male	18.5	18.5	Right	L on R	NA	Neither	Freq	Never	171.00
57	Female	15.5	15.4	Right	R on L	70	Neither	None	Never	157.48
58	Male	19.5	19.7	Right	R on L	72	Right	Freq	Never	NA
59	Male	19.5	19.0	Right	L on R	62	Right	Freq	Never	177.80
60	Male	20.6	21.0	Left	L on R	NA	Left	Freq	Occas	175.26
61	Male	22.8	23.2	Right	R on L	66	Neither	Freq	Never	187.00
62	Female	18.5	18.2	Right	R on L	72	Neither	Freq	Never	167.64
63	Female	19.6	19.7	Right	L on R	70	Right	Freq	Never	178.00
64	Female	18.7	18.0	Left	L on R	NA	Left	None	Never	170.00
65	Female	17.3	18.0	Right	L on R	64	Neither	Freq	Never	164.00
66	Male	19.5	19.8	Right	Neither	NA	Right	Freq	Never	183.00
67	Female	19.0	19.1	Right	L on R	NA	Neither	Freq	Never	172.00
68	Female	18.5	18.0	Right	R on L	64	Right	Freq	Never	NA
69	Male	19.0	19.0	Right	L on R	NA	Right	Some	Never	180.00
70	Male	21.0	19.5	Right	L on R	80	Left	None	<NA>	NA
71	Female	18.0	17.5	Right	L on R	64	Left	Freq	Never	170.00

72	Male	19.4	19.5	Right	R on L	NA	Right Freq Heavy	176.00
73	Female	17.0	16.6	Right	R on L	68	Right Some Never	171.00
74	Female	16.5	17.0	Right	L on R	40	Left Freq Never	167.64
75	Female	15.6	15.8	Right	R on L	88	Left Some Never	165.00
76	Female	17.5	17.5	Right	Neither	68	Right Freq Heavy	170.00
77	Female	17.0	17.6	Right	L on R	76	Right Some Never	165.00
78	Female	18.6	18.0	Right	L on R	NA	Neither Freq Heavy	165.10
79	Female	18.3	18.5	Right	R on L	68	Neither Some Never	165.10
80	Male	20.0	20.5	Right	L on R	NA	Right Freq Never	185.42
81	Male	19.5	19.5	Left	R on L	66	Left Some Never	NA
82	Male	19.2	18.9	Right	R on L	76	Right Freq Never	176.50
83	Female	17.5	17.5	Right	R on L	98	Left Freq Never	NA

M.I Age

1	Metric	18.250
2	Imperial	17.583
3	<NA>	16.917
4	Metric	20.333
5	Metric	23.667
6	Imperial	21.000
7	Imperial	18.833
8	Metric	35.833
9	Metric	19.000
10	Metric	22.333
11	Imperial	28.500
12	<NA>	18.250
13	Metric	18.750
14	Metric	17.500
15	<NA>	17.167
16	Metric	17.167
17	Metric	19.333
18	Imperial	18.333
19	Imperial	19.750
20	Metric	17.917
21	Imperial	17.917
22	Imperial	18.167
23	Imperial	17.833
24	Metric	18.250
25	<NA>	19.167
26	<NA>	17.583
27	Imperial	17.500
28	Imperial	18.083
29	<NA>	21.917
30	Metric	19.250

31 <NA> 41.583
32 Metric 17.500
33 Imperial 39.750
34 Metric 17.167
35 <NA> 17.750
36 Metric 18.000
37 Metric 19.000
38 Metric 17.917
39 Metric 35.500
40 Metric 19.917
41 Metric 17.500
42 Imperial 17.083
43 Metric 28.583
44 Imperial 17.500
45 Imperial 17.417
46 Imperial 18.500
47 Metric 18.917
48 Metric 19.417
49 Metric 18.417
50 Metric 30.750
51 Metric 18.500
52 Metric 17.500
53 Imperial 18.333
54 Metric 17.417
55 Metric 20.000
56 Metric 18.333
57 Imperial 17.167
58 <NA> 17.417
59 Imperial 17.667
60 Imperial 18.417
61 Metric 20.333
62 Imperial 17.333
63 Metric 17.500
64 Metric 19.833
65 Metric 18.583
66 Metric 18.000
67 Metric 30.667
68 <NA> 16.917
69 Metric 19.917
70 <NA> 18.333
71 Metric 17.583
72 Metric 17.833
73 Metric 17.667

```

74 Imperial 17.417
75 Metric 17.750
76 Metric 20.667
77 Metric 23.583
78 Imperial 17.167
79 Imperial 17.083
80 Imperial 18.750
81 <NA> 16.750
82 Imperial 20.167
83 <NA> 17.667
[ reached 'max' / getOption("max.print") -- omitted 154 rows ]

```

> # 4. Check the class and type of the data set survey in MASS.

```

> class(survey)
[1] "data.frame"
> typeof(survey)
[1] "list"

```

> # 5. Get the number of rows and columns of the survey data frame.

```

> ncol(survey)
[1] 12
> nrow(survey)
[1] 237

```

> # 6. Get the dimension of the survey data frame.

```

> dim(survey)
[1] 237 12

```

> # 7. Provide the statistical summary of the data frame.

```

> summary(survey)
  Sex      Wr.Hnd    NW.Hnd    W.Hnd    Fold
Female:118 Min. :13.00 Min. :12.50 Left : 18 L on R : 99
Male :118 1st Qu.:17.50 1st Qu.:17.50 Right:218 Neither: 18
NA's : 1 Median :18.50 Median :18.50 NA's : 1 R on L :120
      Mean :18.67 Mean :18.58
      3rd Qu.:19.80 3rd Qu.:19.73
      Max. :23.20 Max. :23.50
      NA's :1 NA's :1
  Pulse    Clap    Exer    Smoke    Height
Min. : 35.00 Left : 39 Freq:115 Heavy: 11 Min. :150.0
1st Qu.: 66.00 Neither: 50 None: 24 Never:189 1st Qu.:165.0
Median : 72.50 Right :147 Some: 98 Occas: 19 Median :171.0
Mean : 74.15 NA's : 1 Regul:17 Mean :172.4

```

```

3rd Qu.: 80.00      NA's : 1  3rd Qu.:180.0
Max.   :104.00      Max.   :200.0
NA's   :45          NA's   :28
  M.I      Age
Imperial: 68  Min.   :16.75
Metric   :141  1st Qu.:17.67
NA's     : 28  Median :18.58
          Mean   :20.37
          3rd Qu.:20.17
          Max.   :73.00

```

> # 8. Display the column names of the survey data frame

```

> names(survey)
[1] "Sex"  "Wr.Hnd" "NW.Hnd" "W.Hnd" "Fold" "Pulse" "Clap"
[8] "Exer" "Smoke" "Height" "M.I"   "Age"

```

> # 9. Retrieve the top 3 rows from the data frame.

```

> head(survey, 3)
  Sex Wr.Hnd NW.Hnd W.Hnd  Fold Pulse  Clap Exer Smoke Height
1 Female  18.5  18.0 Right R on L   92  Left Some Never  173.0
2  Male  19.5  20.5 Left R on L  104  Left None Regul  177.8
3  Male  18.0  13.3 Right L on R   87 Neither None Occas   NA
  M.I  Age
1 Metric 18.250
2 Imperial 17.583
3  <NA> 16.917

```

> # 10. Extract the bottom 2 rows from the data frame.

```

> tail(survey, 2)
  Sex Wr.Hnd NW.Hnd W.Hnd  Fold Pulse  Clap Exer Smoke Height
236 Male  21.0  21.5 Right R on L   90 Right Some Never  183.0
237 Female  17.6  17.3 Right R on L   85 Right Freq Never  168.5
  M.I  Age
236 Metric 17.167
237 Metric 17.750

```