Final Project

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```r
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ---------------------- tidyverse 2.0.0 --
## v dplyr     1.1.2     v readr     2.1.4
## v forcats   1.0.0     v stringr   1.5.0
## v ggplot2   3.4.2     v tibble    3.2.1
## v lubridate 1.9.2     v tidyr     1.3.0
## v purrr     1.0.1
## -- Conflicts ----------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to beco
```

```r
library(broom)
library(tidyverse)
library(tidyr)
library(dplyr)
```

Load the dataset

```r
library(tidyr)
library(ggplot2)
library(ggmosaic)
library(dplyr)
Sleep_health_and_lifestyle_dataset <- read_csv("Sleep_health_and_lifestyle_dataset.csv")
```

```
## Rows: 374 Columns: 13
## -- Column specification -------------------------------------------------------
## Delimiter: ","
## chr (5): Gender, Occupation, BMI Category, Blood Pressure, Sleep Disorder
## dbl (8): Person ID, Age, Sleep Duration, Quality of Sleep, Physical Activity...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

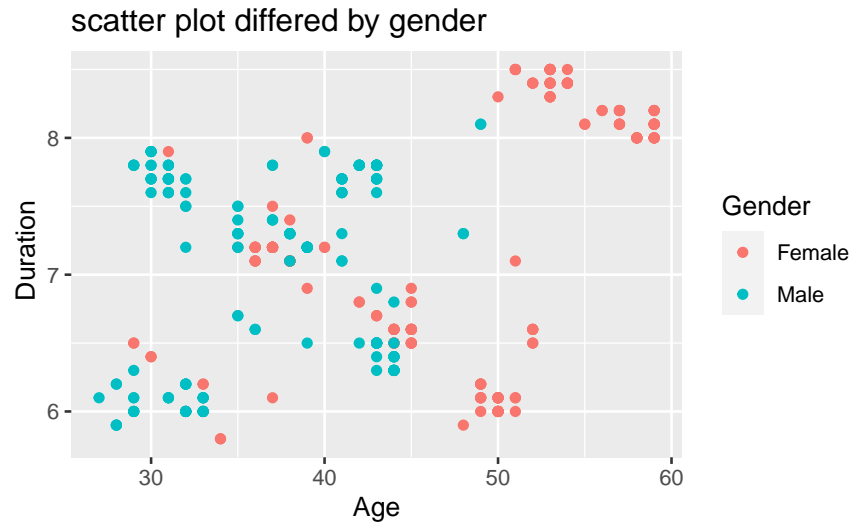**Part1**

```
Sleep_health_and_lifestyle_dataset_renamed <- Sleep_health_and_lifestyle_dataset %>%
  rename( Duration = 'Sleep Duration',
          Stress = 'Stress Level',
          Physical = 'Physical Activity Level' ,
          Quality = 'Quality of Sleep' ,
          BMI= 'BMI Category' ,
          BPressure = 'Blood Pressure' ,
          HRate = 'Heart Rate' ,
          DSteps = 'Daily Steps' ,
          Disorder = 'Sleep Disorder' )
```

Part 2

```
Sleep_health_and_lifestyle_dataset_renamed <- Sleep_health_and_lifestyle_dataset%>%
  rename( ID = "Person ID",
          Duration = 'Sleep Duration',
          Stress = 'Stress Level',
          Physical = 'Physical Activity Level' ,
          Quality = 'Quality of Sleep' ,
          BMI= 'BMI Category' ,
          BPressure = 'Blood Pressure' ,
          HRate = 'Heart Rate' ,
          DSteps = 'Daily Steps' ,
          Disorder = 'Sleep Disorder' )
```

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot()+
  geom_point( mapping = aes( x = Age , y = Duration, color = Gender))+
  labs(
   title = "scatter plot differed by gender",
   x= "Age", y = " Duration")
```
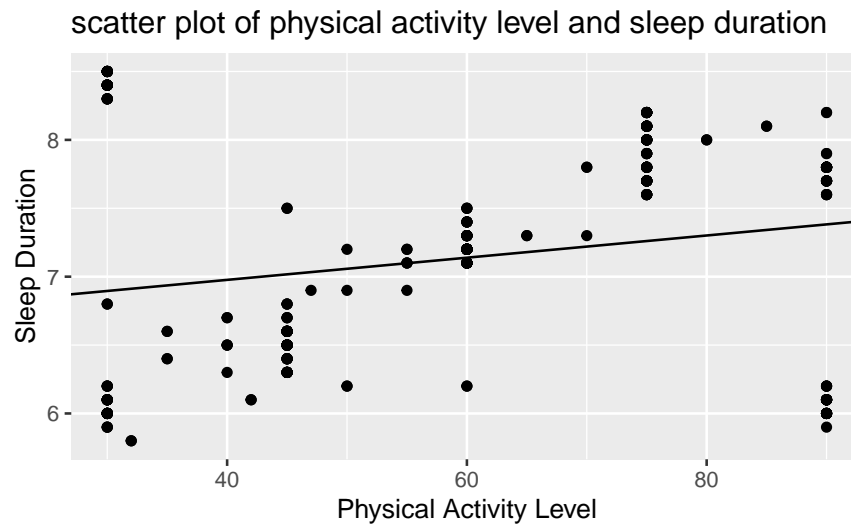
scatter plot differed by gender


```r
model_2 <- lm(Duration ~ Physical,Sleep_health_and_lifestyle_dataset_renamed)
```

```r
model_2$coefficients
```

```
## (Intercept)    Physical
## 6.652127945 0.008111349
```

```r
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
  geom_point(mapping = aes(x = Physical, y = Duration), bin = 10) +
  geom_abline(slope = model_2$coefficients[2],
              intercept = model_2$coefficients[1])+
   labs(x = "Physical Activity Level", y = "Sleep Duration",
                 title = "scatter plot of physical activity level and sleep duration" )
```

```
## Warning in geom_point(mapping = aes(x = Physical, y = Duration), bin = 10):
## Ignoring unknown parameters: 'bin'
```

scatter plot of physical activity level and sleep duration

Part 3

```r
library(tidyr)
library(ggplot2)
library(ggmosaic)
library(dplyr)
Sleep_health_and_lifestyle_dataset <- read_csv("Sleep_health_and_lifestyle_dataset.csv")
```

```
## Rows: 374 Columns: 13
## -- Column specification -----------------------------------------------
## Delimiter: ","
## chr (5): Gender, Occupation, BMI Category, Blood Pressure, Sleep Disorder
## dbl (8): Person ID, Age, Sleep Duration, Quality of Sleep, Physical Activity...
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```r
Sleep_health_and_lifestyle_dataset_renamed <- Sleep_health_and_lifestyle_dataset %>%
  rename( ID = 'Person ID',
          Duration = 'Sleep Duration',
          Stress = 'Stress Level',
          Physical = 'Physical Activity Level' ,
          Quality = 'Quality of Sleep' ,
          BMI= 'BMI Category' ,
          BPressure = 'Blood Pressure' ,
          HRate = 'Heart Rate' ,
          DSteps = 'Daily Steps' ,
          Disorder = 'Sleep Disorder')
```

```
Sleep_health_and_lifestyle_dataset_renamed$BMI[Sleep_health_and_lifestyle_dataset_renamed$BMI
Sleep_health_and_lifestyle_dataset_renamed$BMI[Sleep_health_and_lifestyle_dataset_renamed$BMI
Sleep_health_and_lifestyle_dataset_renamed$BMI[Sleep_health_and_lifestyle_dataset_renamed$BMI
```

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  select(ID, HRate, Duration, Gender, Age, Occupation, Physical, BMI, Quality) %>%
  arrange(Duration)
```

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
81	81	5.8	Female	34	Scientist	32	Fat	4
82	81	5.8	Female	34	Scientist	32	Fat	4
4	85	5.9	Male	28	Sales Representative	30	Fat	4
5	85	5.9	Male	28	Sales Representative	30	Fat	4
6	85	5.9	Male	28	Software Engineer	30	Fat	4
266	75	5.9	Female	48	Nurse	90	Fat	6
14	70	6.0	Male	29	Doctor	30	Normal	6
15	70	6.0	Male	29	Doctor	30	Normal	6
16	70	6.0	Male	29	Doctor	30	Normal	6
18	70	6.0	Male	29	Doctor	30	Normal	6
53	72	6.0	Male	32	Doctor	30	Normal	6
55	72	6.0	Male	32	Doctor	30	Normal	6
56	72	6.0	Male	32	Doctor	30	Normal	6
58	72	6.0	Male	32	Doctor	30	Normal	6
59	72	6.0	Male	32	Doctor	30	Normal	6
61	72	6.0	Male	32	Doctor	30	Normal	6
62	72	6.0	Male	32	Doctor	30	Normal	6
68	72	6.0	Male	33	Doctor	30	Normal	6
75	72	6.0	Male	33	Doctor	30	Normal	6
76	72	6.0	Male	33	Doctor	30	Normal	6
77	72	6.0	Male	33	Doctor	30	Normal	6
78	72	6.0	Male	33	Doctor	30	Normal	6
79	72	6.0	Male	33	Doctor	30	Normal	6
80	72	6.0	Male	33	Doctor	30	Normal	6
269	75	6.0	Female	49	Nurse	90	Fat	6
281	75	6.0	Female	50	Nurse	90	Fat	6
283	75	6.0	Female	50	Nurse	90	Fat	6
284	75	6.0	Female	50	Nurse	90	Fat	6
285	75	6.0	Female	50	Nurse	90	Fat	6
286	75	6.0	Female	50	Nurse	90	Fat	6
287	75	6.0	Female	50	Nurse	90	Fat	6
288	75	6.0	Female	50	Nurse	90	Fat	6
289	75	6.0	Female	50	Nurse	90	Fat	6
291	75	6.0	Female	50	Nurse	90	Fat	6
294	75	6.0	Female	50	Nurse	90	Fat	6
296	75	6.0	Female	50	Nurse	90	Fat	6

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
304	75	6.0	Female	51	Nurse	90	Fat	6
1	77	6.1	Male	27	Software Engineer	42	Fat	6
11	70	6.1	Male	29	Doctor	30	Normal	6
13	70	6.1	Male	29	Doctor	30	Normal	6
34	72	6.1	Male	31	Doctor	30	Normal	6
36	72	6.1	Male	31	Doctor	30	Normal	6
37	72	6.1	Male	31	Doctor	30	Normal	6
71	72	6.1	Male	33	Doctor	30	Normal	6
72	72	6.1	Male	33	Doctor	30	Normal	6
73	72	6.1	Male	33	Doctor	30	Normal	6
74	72	6.1	Male	33	Doctor	30	Normal	6
107	77	6.1	Female	37	Nurse	42	Fat	6
270	75	6.1	Female	49	Nurse	90	Fat	6
271	75	6.1	Female	49	Nurse	90	Fat	6
272	75	6.1	Female	49	Nurse	90	Fat	6
273	75	6.1	Female	49	Nurse	90	Fat	6
279	75	6.1	Female	50	Nurse	90	Fat	6
282	75	6.1	Female	50	Nurse	90	Fat	6
290	75	6.1	Female	50	Nurse	90	Fat	6
292	75	6.1	Female	50	Nurse	90	Fat	6
293	75	6.1	Female	50	Nurse	90	Fat	6
295	75	6.1	Female	50	Nurse	90	Fat	6
297	75	6.1	Female	50	Nurse	90	Fat	6
298	75	6.1	Female	50	Nurse	90	Fat	6
305	75	6.1	Female	51	Nurse	90	Fat	6
306	75	6.1	Female	51	Nurse	90	Fat	6
2	75	6.2	Male	28	Doctor	60	Normal	6
3	75	6.2	Male	28	Doctor	60	Normal	6
63	72	6.2	Male	32	Doctor	30	Normal	6
64	72	6.2	Male	32	Doctor	30	Normal	6
65	72	6.2	Male	32	Doctor	30	Normal	6
66	72	6.2	Male	32	Doctor	30	Normal	6
69	76	6.2	Female	33	Scientist	50	Fat	6
70	76	6.2	Female	33	Scientist	50	Fat	6
268	75	6.2	Female	49	Nurse	90	Fat	6
274	75	6.2	Female	49	Nurse	90	Fat	6
275	75	6.2	Female	49	Nurse	90	Fat	6
276	75	6.2	Female	49	Nurse	90	Fat	6
7	82	6.3	Male	29	Teacher	40	Fat	6
188	72	6.3	Male	43	Salesperson	45	Fat	6
223	72	6.3	Male	44	Salesperson	45	Fat	6
226	72	6.3	Male	44	Salesperson	45	Fat	6
228	72	6.3	Male	44	Salesperson	45	Fat	6
230	72	6.3	Male	44	Salesperson	45	Fat	6
232	72	6.3	Male	44	Salesperson	45	Fat	6
234	72	6.3	Male	44	Salesperson	45	Fat	6

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
236	72	6.3	Male	44	Salesperson	45	Fat	6
239	72	6.3	Male	44	Salesperson	45	Fat	6
242	72	6.3	Male	44	Salesperson	45	Fat	6
245	72	6.3	Male	44	Salesperson	45	Fat	6
247	72	6.3	Male	44	Salesperson	45	Fat	6
31	78	6.4	Female	30	Nurse	35	Normal	5
32	78	6.4	Female	30	Nurse	35	Normal	5
192	72	6.4	Male	43	Salesperson	45	Fat	6
222	72	6.4	Male	44	Salesperson	45	Fat	6
224	72	6.4	Male	44	Salesperson	45	Fat	6
237	72	6.4	Male	44	Salesperson	45	Fat	6
240	72	6.4	Male	44	Salesperson	45	Fat	6
243	72	6.4	Male	44	Salesperson	45	Fat	6
249	72	6.4	Male	44	Salesperson	45	Fat	6
17	80	6.5	Female	29	Nurse	40	Normal	5
19	80	6.5	Female	29	Nurse	40	Normal	5
148	80	6.5	Male	39	Engineer	40	Fat	5
178	72	6.5	Male	42	Salesperson	45	Fat	6
190	72	6.5	Male	43	Salesperson	45	Fat	6
193	72	6.5	Male	43	Salesperson	45	Fat	6
194	72	6.5	Male	43	Salesperson	45	Fat	6
195	72	6.5	Male	43	Salesperson	45	Fat	6
196	72	6.5	Male	43	Salesperson	45	Fat	6
197	72	6.5	Male	43	Salesperson	45	Fat	6
198	72	6.5	Male	43	Salesperson	45	Fat	6
199	72	6.5	Male	43	Salesperson	45	Fat	6
200	72	6.5	Male	43	Salesperson	45	Fat	6
201	72	6.5	Male	43	Salesperson	45	Fat	6
220	72	6.5	Male	43	Salesperson	45	Fat	6
238	65	6.5	Female	44	Teacher	45	Fat	7
241	65	6.5	Female	44	Teacher	45	Fat	7
244	65	6.5	Female	44	Teacher	45	Fat	7
246	65	6.5	Female	44	Teacher	45	Fat	7
250	72	6.5	Male	44	Salesperson	45	Fat	6
253	65	6.5	Female	45	Teacher	45	Fat	7
254	65	6.5	Female	45	Teacher	45	Fat	7
255	65	6.5	Female	45	Teacher	45	Fat	7
256	65	6.5	Female	45	Teacher	45	Fat	7
307	72	6.5	Female	52	Accountant	45	Fat	7
308	72	6.5	Female	52	Accountant	45	Fat	7
104	74	6.6	Male	36	Teacher	35	Fat	5
106	74	6.6	Male	36	Teacher	35	Fat	5
221	65	6.6	Female	44	Teacher	45	Fat	7
225	65	6.6	Female	44	Teacher	45	Fat	7
227	65	6.6	Female	44	Teacher	45	Fat	7
229	65	6.6	Female	44	Teacher	45	Fat	7

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
231	65	6.6	Female	44	Teacher	45	Fat	7
233	65	6.6	Female	44	Teacher	45	Fat	7
235	65	6.6	Female	44	Teacher	45	Fat	7
257	65	6.6	Female	45	Teacher	45	Fat	7
258	65	6.6	Female	45	Teacher	45	Fat	7
259	65	6.6	Female	45	Teacher	45	Fat	7
260	65	6.6	Female	45	Teacher	45	Fat	7
261	65	6.6	Female	45	Teacher	45	Fat	7
262	65	6.6	Female	45	Teacher	45	Fat	7
263	65	6.6	Female	45	Teacher	45	Fat	7
309	72	6.6	Female	52	Accountant	45	Fat	7
310	72	6.6	Female	52	Accountant	45	Fat	7
311	72	6.6	Female	52	Accountant	45	Fat	7
312	72	6.6	Female	52	Accountant	45	Fat	7
83	70	6.7	Male	35	Teacher	40	Fat	7
84	70	6.7	Male	35	Teacher	40	Fat	7
187	65	6.7	Female	43	Teacher	45	Fat	7
189	65	6.7	Female	43	Teacher	45	Fat	7
191	65	6.7	Female	43	Teacher	45	Fat	7
185	78	6.8	Female	42	Teacher	45	Fat	6
186	78	6.8	Female	42	Teacher	45	Fat	6
248	78	6.8	Male	44	Engineer	45	Fat	7
251	65	6.8	Female	45	Teacher	30	Fat	7
252	65	6.8	Female	45	Teacher	30	Fat	7
149	75	6.9	Female	39	Lawyer	50	Normal	7
204	69	6.9	Male	43	Engineer	47	Normal	6
264	75	6.9	Female	45	Manager	55	Fat	7
96	68	7.1	Female	36	Accountant	60	Normal	8
98	68	7.1	Female	36	Accountant	60	Normal	8
99	68	7.1	Female	36	Teacher	60	Normal	8
100	68	7.1	Female	36	Teacher	60	Normal	8
128	68	7.1	Female	38	Accountant	60	Normal	8
131	68	7.1	Female	38	Accountant	60	Normal	8
134	68	7.1	Female	38	Accountant	60	Normal	8
137	68	7.1	Female	38	Accountant	60	Normal	8
138	68	7.1	Male	38	Lawyer	60	Normal	8
139	68	7.1	Female	38	Accountant	60	Normal	8
140	68	7.1	Male	38	Lawyer	60	Normal	8
141	68	7.1	Female	38	Accountant	60	Normal	8
142	68	7.1	Male	38	Lawyer	60	Normal	8
143	68	7.1	Female	38	Accountant	60	Normal	8
144	68	7.1	Female	38	Accountant	60	Normal	8
145	68	7.1	Male	38	Lawyer	60	Normal	8
168	72	7.1	Male	41	Lawyer	55	Fat	7
169	72	7.1	Male	41	Lawyer	55	Fat	7
303	72	7.1	Female	51	Nurse	55	Normal	7

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
67	68	7.2	Male	32	Accountant	50	Normal	8
86	68	7.2	Female	35	Accountant	60	Normal	8
87	65	7.2	Male	35	Engineer	60	Normal	8
88	65	7.2	Male	35	Engineer	60	Normal	8
95	68	7.2	Female	36	Accountant	60	Normal	8
97	68	7.2	Female	36	Accountant	60	Normal	8
101	68	7.2	Female	36	Teacher	60	Normal	8
102	68	7.2	Female	36	Teacher	60	Normal	8
103	68	7.2	Female	36	Teacher	60	Normal	8
105	68	7.2	Female	36	Teacher	60	Normal	8
111	68	7.2	Female	37	Accountant	60	Normal	8
113	68	7.2	Female	37	Accountant	60	Normal	8
115	68	7.2	Female	37	Accountant	60	Normal	8
116	68	7.2	Female	37	Accountant	60	Normal	8
117	68	7.2	Female	37	Accountant	60	Normal	8
118	68	7.2	Female	37	Accountant	60	Normal	8
119	68	7.2	Female	37	Accountant	60	Normal	8
120	68	7.2	Female	37	Accountant	60	Normal	8
121	68	7.2	Female	37	Accountant	60	Normal	8
122	68	7.2	Female	37	Accountant	60	Normal	8
123	68	7.2	Female	37	Accountant	60	Normal	8
124	68	7.2	Female	37	Accountant	60	Normal	8
125	68	7.2	Female	37	Accountant	60	Normal	8
147	68	7.2	Male	39	Lawyer	60	Normal	8
152	68	7.2	Male	39	Lawyer	60	Normal	8
153	68	7.2	Male	39	Lawyer	60	Normal	8
154	68	7.2	Male	39	Lawyer	60	Normal	8
155	68	7.2	Male	39	Lawyer	60	Normal	8
156	68	7.2	Male	39	Lawyer	60	Normal	8
157	68	7.2	Male	39	Lawyer	60	Normal	8
158	68	7.2	Male	39	Lawyer	60	Normal	8
159	68	7.2	Male	39	Lawyer	60	Normal	8
160	68	7.2	Male	39	Lawyer	60	Normal	8
161	68	7.2	Male	39	Lawyer	60	Normal	8
162	73	7.2	Female	40	Accountant	55	Normal	8
163	73	7.2	Female	40	Accountant	55	Normal	8
89	65	7.3	Male	35	Engineer	60	Normal	8
90	65	7.3	Male	35	Engineer	60	Normal	8
91	65	7.3	Male	35	Engineer	60	Normal	8
92	65	7.3	Male	35	Engineer	60	Normal	8
127	68	7.3	Male	38	Lawyer	60	Normal	8
129	68	7.3	Male	38	Lawyer	60	Normal	8
130	68	7.3	Male	38	Lawyer	60	Normal	8
132	68	7.3	Male	38	Lawyer	60	Normal	8
133	68	7.3	Male	38	Lawyer	60	Normal	8
135	68	7.3	Male	38	Lawyer	60	Normal	8

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
136	68	7.3	Male	38	Lawyer	60	Normal	8
167	72	7.3	Male	41	Engineer	70	Normal	8
265	83	7.3	Male	48	Doctor	65	Fat	7
267	83	7.3	Male	48	Doctor	65	Fat	7
94	84	7.4	Male	35	Lawyer	60	Fat	7
110	68	7.4	Male	37	Lawyer	60	Normal	8
112	68	7.4	Male	37	Lawyer	60	Normal	8
114	68	7.4	Male	37	Lawyer	60	Normal	8
146	84	7.4	Female	38	Lawyer	60	Fat	7
51	70	7.5	Male	32	Engineer	45	Normal	8
52	70	7.5	Male	32	Engineer	45	Normal	8
85	70	7.5	Male	35	Software Engineer	60	Normal	8
93	70	7.5	Male	35	Software Engineer	60	Normal	8
126	70	7.5	Female	37	Nurse	60	Normal	8
20	70	7.6	Male	30	Doctor	75	Normal	7
38	70	7.6	Male	31	Doctor	75	Normal	7
39	70	7.6	Male	31	Doctor	75	Normal	7
40	70	7.6	Male	31	Doctor	75	Normal	7
54	70	7.6	Male	32	Doctor	75	Normal	7
166	70	7.6	Male	41	Lawyer	90	Normal	8
175	70	7.6	Male	41	Lawyer	90	Normal	8
176	70	7.6	Male	41	Lawyer	90	Normal	8
177	70	7.6	Male	41	Lawyer	90	Normal	8
205	68	7.6	Male	43	Engineer	75	Fat	8
21	70	7.7	Male	30	Doctor	75	Normal	7
22	70	7.7	Male	30	Doctor	75	Normal	7
23	70	7.7	Male	30	Doctor	75	Normal	7
24	70	7.7	Male	30	Doctor	75	Normal	7
35	70	7.7	Male	31	Doctor	75	Normal	7
41	70	7.7	Male	31	Doctor	75	Normal	7
42	70	7.7	Male	31	Doctor	75	Normal	7
43	70	7.7	Male	31	Doctor	75	Normal	7
45	70	7.7	Male	31	Doctor	75	Normal	7
47	70	7.7	Male	31	Doctor	75	Normal	7
49	70	7.7	Male	31	Doctor	75	Normal	7
50	70	7.7	Male	31	Doctor	75	Normal	7
57	70	7.7	Male	32	Doctor	75	Normal	7
60	70	7.7	Male	32	Doctor	75	Normal	7
170	70	7.7	Male	41	Lawyer	90	Normal	8
171	70	7.7	Male	41	Lawyer	90	Normal	8
172	70	7.7	Male	41	Lawyer	90	Normal	8
173	70	7.7	Male	41	Lawyer	90	Normal	8
174	70	7.7	Male	41	Lawyer	90	Normal	8
206	70	7.7	Male	43	Engineer	90	Normal	8
207	70	7.7	Male	43	Engineer	90	Normal	8
208	70	7.7	Male	43	Engineer	90	Normal	8

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
209	70	7.7	Male	43	Engineer	90	Normal	8
211	70	7.7	Male	43	Engineer	90	Normal	8
8	70	7.8	Male	29	Doctor	75	Normal	7
9	70	7.8	Male	29	Doctor	75	Normal	7
10	70	7.8	Male	29	Doctor	75	Normal	7
12	70	7.8	Male	29	Doctor	75	Normal	7
25	70	7.8	Male	30	Doctor	75	Normal	7
27	70	7.8	Male	30	Doctor	75	Normal	7
44	70	7.8	Male	31	Doctor	75	Normal	7
46	70	7.8	Male	31	Doctor	75	Normal	7
48	70	7.8	Male	31	Doctor	75	Normal	7
108	68	7.8	Male	37	Engineer	70	Normal	8
109	68	7.8	Male	37	Engineer	70	Normal	8
179	70	7.8	Male	42	Lawyer	90	Normal	8
180	70	7.8	Male	42	Lawyer	90	Normal	8
181	70	7.8	Male	42	Lawyer	90	Normal	8
182	70	7.8	Male	42	Lawyer	90	Normal	8
183	70	7.8	Male	42	Lawyer	90	Normal	8
184	70	7.8	Male	42	Lawyer	90	Normal	8
202	70	7.8	Male	43	Engineer	90	Normal	8
203	70	7.8	Male	43	Engineer	90	Normal	8
210	70	7.8	Male	43	Engineer	90	Normal	8
212	70	7.8	Male	43	Engineer	90	Normal	8
213	70	7.8	Male	43	Engineer	90	Normal	8
214	70	7.8	Male	43	Engineer	90	Normal	8
215	70	7.8	Male	43	Engineer	90	Normal	8
216	70	7.8	Male	43	Engineer	90	Normal	8
217	70	7.8	Male	43	Engineer	90	Normal	8
218	70	7.8	Male	43	Engineer	90	Normal	8
219	70	7.8	Male	43	Engineer	90	Normal	8
26	70	7.9	Male	30	Doctor	75	Normal	7
28	70	7.9	Male	30	Doctor	75	Normal	7
29	70	7.9	Male	30	Doctor	75	Normal	7
30	70	7.9	Male	30	Doctor	75	Normal	7
33	69	7.9	Female	31	Nurse	75	Normal	8
164	68	7.9	Male	40	Lawyer	90	Normal	8
165	68	7.9	Male	40	Lawyer	90	Normal	8
150	67	8.0	Female	39	Accountant	80	Normal	9
151	67	8.0	Female	39	Accountant	80	Normal	9
353	68	8.0	Female	58	Nurse	75	Fat	9
354	68	8.0	Female	58	Nurse	75	Fat	9
355	68	8.0	Female	58	Nurse	75	Fat	9
356	68	8.0	Female	58	Nurse	75	Fat	9
357	68	8.0	Female	58	Nurse	75	Fat	9
358	68	8.0	Female	58	Nurse	75	Fat	9
359	68	8.0	Female	59	Nurse	75	Fat	9

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
365	68	8.0	Female	59	Nurse	75	Fat	9
366	68	8.0	Female	59	Nurse	75	Fat	9
368	68	8.0	Female	59	Nurse	75	Fat	9
371	68	8.0	Female	59	Nurse	75	Fat	9
277	86	8.1	Male	49	Doctor	85	Fat	9
278	86	8.1	Male	49	Doctor	85	Fat	9
340	72	8.1	Female	55	Nurse	75	Fat	9
341	72	8.1	Female	55	Nurse	75	Fat	9
344	68	8.1	Female	57	Nurse	75	Fat	9
350	68	8.1	Female	57	Nurse	75	Fat	9
351	68	8.1	Female	57	Nurse	75	Fat	9
352	68	8.1	Female	57	Nurse	75	Fat	9
360	68	8.1	Female	59	Nurse	75	Fat	9
367	68	8.1	Female	59	Nurse	75	Fat	9
369	68	8.1	Female	59	Nurse	75	Fat	9
370	68	8.1	Female	59	Nurse	75	Fat	9
372	68	8.1	Female	59	Nurse	75	Fat	9
373	68	8.1	Female	59	Nurse	75	Fat	9
374	68	8.1	Female	59	Nurse	75	Fat	9
342	65	8.2	Female	56	Doctor	90	Normal	9
343	65	8.2	Female	56	Doctor	90	Normal	9
345	68	8.2	Female	57	Nurse	75	Fat	9
346	68	8.2	Female	57	Nurse	75	Fat	9
347	68	8.2	Female	57	Nurse	75	Fat	9
348	68	8.2	Female	57	Nurse	75	Fat	9
349	68	8.2	Female	57	Nurse	75	Fat	9
361	68	8.2	Female	59	Nurse	75	Fat	9
362	68	8.2	Female	59	Nurse	75	Fat	9
363	68	8.2	Female	59	Nurse	75	Fat	9
364	68	8.2	Female	59	Nurse	75	Fat	9
280	65	8.3	Female	50	Engineer	30	Normal	9
316	65	8.3	Female	53	Engineer	30	Normal	9
325	65	8.3	Female	53	Engineer	30	Normal	9
327	65	8.3	Female	53	Engineer	30	Normal	9
329	65	8.3	Female	53	Engineer	30	Normal	9
313	65	8.4	Female	52	Engineer	30	Normal	9
314	65	8.4	Female	52	Engineer	30	Normal	9
315	65	8.4	Female	52	Engineer	30	Normal	9
319	65	8.4	Female	53	Engineer	30	Normal	9
320	65	8.4	Female	53	Engineer	30	Normal	9
322	65	8.4	Female	53	Engineer	30	Normal	9
323	65	8.4	Female	53	Engineer	30	Normal	9
332	65	8.4	Female	53	Engineer	30	Normal	9
333	65	8.4	Female	54	Engineer	30	Normal	9
334	65	8.4	Female	54	Engineer	30	Normal	9
335	65	8.4	Female	54	Engineer	30	Normal	9

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
336	65	8.4	Female	54	Engineer	30	Normal	9
337	65	8.4	Female	54	Engineer	30	Normal	9
338	65	8.4	Female	54	Engineer	30	Normal	9
299	65	8.5	Female	51	Engineer	30	Normal	9
300	65	8.5	Female	51	Engineer	30	Normal	9
301	65	8.5	Female	51	Engineer	30	Normal	9
302	65	8.5	Female	51	Engineer	30	Normal	9
317	65	8.5	Female	53	Engineer	30	Normal	9
318	65	8.5	Female	53	Engineer	30	Normal	9
321	65	8.5	Female	53	Engineer	30	Normal	9
324	65	8.5	Female	53	Engineer	30	Normal	9
326	65	8.5	Female	53	Engineer	30	Normal	9
328	65	8.5	Female	53	Engineer	30	Normal	9
330	65	8.5	Female	53	Engineer	30	Normal	9
331	65	8.5	Female	53	Engineer	30	Normal	9
339	65	8.5	Female	54	Engineer	30	Normal	9

```
Sleep_health_and_lifestyle_dataset_renamed %>%
 select(ID, HRate, Duration, Gender, Age, Occupation, Physical, BMI, Quality) %>%
  arrange(Duration) %>%
  filter(Gender == 'Female')
```

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
81	81	5.8	Female	34	Scientist	32	Fat	4
82	81	5.8	Female	34	Scientist	32	Fat	4
266	75	5.9	Female	48	Nurse	90	Fat	6
269	75	6.0	Female	49	Nurse	90	Fat	6
281	75	6.0	Female	50	Nurse	90	Fat	6
283	75	6.0	Female	50	Nurse	90	Fat	6
284	75	6.0	Female	50	Nurse	90	Fat	6
285	75	6.0	Female	50	Nurse	90	Fat	6
286	75	6.0	Female	50	Nurse	90	Fat	6
287	75	6.0	Female	50	Nurse	90	Fat	6
288	75	6.0	Female	50	Nurse	90	Fat	6
289	75	6.0	Female	50	Nurse	90	Fat	6
291	75	6.0	Female	50	Nurse	90	Fat	6
294	75	6.0	Female	50	Nurse	90	Fat	6
296	75	6.0	Female	50	Nurse	90	Fat	6
304	75	6.0	Female	51	Nurse	90	Fat	6
107	77	6.1	Female	37	Nurse	42	Fat	6
270	75	6.1	Female	49	Nurse	90	Fat	6
271	75	6.1	Female	49	Nurse	90	Fat	6
272	75	6.1	Female	49	Nurse	90	Fat	6
273	75	6.1	Female	49	Nurse	90	Fat	6

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
279	75	6.1	Female	50	Nurse	90	Fat	6
282	75	6.1	Female	50	Nurse	90	Fat	6
290	75	6.1	Female	50	Nurse	90	Fat	6
292	75	6.1	Female	50	Nurse	90	Fat	6
293	75	6.1	Female	50	Nurse	90	Fat	6
295	75	6.1	Female	50	Nurse	90	Fat	6
297	75	6.1	Female	50	Nurse	90	Fat	6
298	75	6.1	Female	50	Nurse	90	Fat	6
305	75	6.1	Female	51	Nurse	90	Fat	6
306	75	6.1	Female	51	Nurse	90	Fat	6
69	76	6.2	Female	33	Scientist	50	Fat	6
70	76	6.2	Female	33	Scientist	50	Fat	6
268	75	6.2	Female	49	Nurse	90	Fat	6
274	75	6.2	Female	49	Nurse	90	Fat	6
275	75	6.2	Female	49	Nurse	90	Fat	6
276	75	6.2	Female	49	Nurse	90	Fat	6
31	78	6.4	Female	30	Nurse	35	Normal	5
32	78	6.4	Female	30	Nurse	35	Normal	5
17	80	6.5	Female	29	Nurse	40	Normal	5
19	80	6.5	Female	29	Nurse	40	Normal	5
238	65	6.5	Female	44	Teacher	45	Fat	7
241	65	6.5	Female	44	Teacher	45	Fat	7
244	65	6.5	Female	44	Teacher	45	Fat	7
246	65	6.5	Female	44	Teacher	45	Fat	7
253	65	6.5	Female	45	Teacher	45	Fat	7
254	65	6.5	Female	45	Teacher	45	Fat	7
255	65	6.5	Female	45	Teacher	45	Fat	7
256	65	6.5	Female	45	Teacher	45	Fat	7
307	72	6.5	Female	52	Accountant	45	Fat	7
308	72	6.5	Female	52	Accountant	45	Fat	7
221	65	6.6	Female	44	Teacher	45	Fat	7
225	65	6.6	Female	44	Teacher	45	Fat	7
227	65	6.6	Female	44	Teacher	45	Fat	7
229	65	6.6	Female	44	Teacher	45	Fat	7
231	65	6.6	Female	44	Teacher	45	Fat	7
233	65	6.6	Female	44	Teacher	45	Fat	7
235	65	6.6	Female	44	Teacher	45	Fat	7
257	65	6.6	Female	45	Teacher	45	Fat	7
258	65	6.6	Female	45	Teacher	45	Fat	7
259	65	6.6	Female	45	Teacher	45	Fat	7
260	65	6.6	Female	45	Teacher	45	Fat	7
261	65	6.6	Female	45	Teacher	45	Fat	7
262	65	6.6	Female	45	Teacher	45	Fat	7
263	65	6.6	Female	45	Teacher	45	Fat	7
309	72	6.6	Female	52	Accountant	45	Fat	7
310	72	6.6	Female	52	Accountant	45	Fat	7

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
311	72	6.6	Female	52	Accountant	45	Fat	7
312	72	6.6	Female	52	Accountant	45	Fat	7
187	65	6.7	Female	43	Teacher	45	Fat	7
189	65	6.7	Female	43	Teacher	45	Fat	7
191	65	6.7	Female	43	Teacher	45	Fat	7
185	78	6.8	Female	42	Teacher	45	Fat	6
186	78	6.8	Female	42	Teacher	45	Fat	6
251	65	6.8	Female	45	Teacher	30	Fat	7
252	65	6.8	Female	45	Teacher	30	Fat	7
149	75	6.9	Female	39	Lawyer	50	Normal	7
264	75	6.9	Female	45	Manager	55	Fat	7
96	68	7.1	Female	36	Accountant	60	Normal	8
98	68	7.1	Female	36	Accountant	60	Normal	8
99	68	7.1	Female	36	Teacher	60	Normal	8
100	68	7.1	Female	36	Teacher	60	Normal	8
128	68	7.1	Female	38	Accountant	60	Normal	8
131	68	7.1	Female	38	Accountant	60	Normal	8
134	68	7.1	Female	38	Accountant	60	Normal	8
137	68	7.1	Female	38	Accountant	60	Normal	8
139	68	7.1	Female	38	Accountant	60	Normal	8
141	68	7.1	Female	38	Accountant	60	Normal	8
143	68	7.1	Female	38	Accountant	60	Normal	8
144	68	7.1	Female	38	Accountant	60	Normal	8
303	72	7.1	Female	51	Nurse	55	Normal	7
86	68	7.2	Female	35	Accountant	60	Normal	8
95	68	7.2	Female	36	Accountant	60	Normal	8
97	68	7.2	Female	36	Accountant	60	Normal	8
101	68	7.2	Female	36	Teacher	60	Normal	8
102	68	7.2	Female	36	Teacher	60	Normal	8
103	68	7.2	Female	36	Teacher	60	Normal	8
105	68	7.2	Female	36	Teacher	60	Normal	8
111	68	7.2	Female	37	Accountant	60	Normal	8
113	68	7.2	Female	37	Accountant	60	Normal	8
115	68	7.2	Female	37	Accountant	60	Normal	8
116	68	7.2	Female	37	Accountant	60	Normal	8
117	68	7.2	Female	37	Accountant	60	Normal	8
118	68	7.2	Female	37	Accountant	60	Normal	8
119	68	7.2	Female	37	Accountant	60	Normal	8
120	68	7.2	Female	37	Accountant	60	Normal	8
121	68	7.2	Female	37	Accountant	60	Normal	8
122	68	7.2	Female	37	Accountant	60	Normal	8
123	68	7.2	Female	37	Accountant	60	Normal	8
124	68	7.2	Female	37	Accountant	60	Normal	8
125	68	7.2	Female	37	Accountant	60	Normal	8
162	73	7.2	Female	40	Accountant	55	Normal	8
163	73	7.2	Female	40	Accountant	55	Normal	8

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
146	84	7.4	Female	38	Lawyer	60	Fat	7
126	70	7.5	Female	37	Nurse	60	Normal	8
33	69	7.9	Female	31	Nurse	75	Normal	8
150	67	8.0	Female	39	Accountant	80	Normal	9
151	67	8.0	Female	39	Accountant	80	Normal	9
353	68	8.0	Female	58	Nurse	75	Fat	9
354	68	8.0	Female	58	Nurse	75	Fat	9
355	68	8.0	Female	58	Nurse	75	Fat	9
356	68	8.0	Female	58	Nurse	75	Fat	9
357	68	8.0	Female	58	Nurse	75	Fat	9
358	68	8.0	Female	58	Nurse	75	Fat	9
359	68	8.0	Female	59	Nurse	75	Fat	9
365	68	8.0	Female	59	Nurse	75	Fat	9
366	68	8.0	Female	59	Nurse	75	Fat	9
368	68	8.0	Female	59	Nurse	75	Fat	9
371	68	8.0	Female	59	Nurse	75	Fat	9
340	72	8.1	Female	55	Nurse	75	Fat	9
341	72	8.1	Female	55	Nurse	75	Fat	9
344	68	8.1	Female	57	Nurse	75	Fat	9
350	68	8.1	Female	57	Nurse	75	Fat	9
351	68	8.1	Female	57	Nurse	75	Fat	9
352	68	8.1	Female	57	Nurse	75	Fat	9
360	68	8.1	Female	59	Nurse	75	Fat	9
367	68	8.1	Female	59	Nurse	75	Fat	9
369	68	8.1	Female	59	Nurse	75	Fat	9
370	68	8.1	Female	59	Nurse	75	Fat	9
372	68	8.1	Female	59	Nurse	75	Fat	9
373	68	8.1	Female	59	Nurse	75	Fat	9
374	68	8.1	Female	59	Nurse	75	Fat	9
342	65	8.2	Female	56	Doctor	90	Normal	9
343	65	8.2	Female	56	Doctor	90	Normal	9
345	68	8.2	Female	57	Nurse	75	Fat	9
346	68	8.2	Female	57	Nurse	75	Fat	9
347	68	8.2	Female	57	Nurse	75	Fat	9
348	68	8.2	Female	57	Nurse	75	Fat	9
349	68	8.2	Female	57	Nurse	75	Fat	9
361	68	8.2	Female	59	Nurse	75	Fat	9
362	68	8.2	Female	59	Nurse	75	Fat	9
363	68	8.2	Female	59	Nurse	75	Fat	9
364	68	8.2	Female	59	Nurse	75	Fat	9
280	65	8.3	Female	50	Engineer	30	Normal	9
316	65	8.3	Female	53	Engineer	30	Normal	9
325	65	8.3	Female	53	Engineer	30	Normal	9
327	65	8.3	Female	53	Engineer	30	Normal	9
329	65	8.3	Female	53	Engineer	30	Normal	9
313	65	8.4	Female	52	Engineer	30	Normal	9

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
314	65	8.4	Female	52	Engineer	30	Normal	9
315	65	8.4	Female	52	Engineer	30	Normal	9
319	65	8.4	Female	53	Engineer	30	Normal	9
320	65	8.4	Female	53	Engineer	30	Normal	9
322	65	8.4	Female	53	Engineer	30	Normal	9
323	65	8.4	Female	53	Engineer	30	Normal	9
332	65	8.4	Female	53	Engineer	30	Normal	9
333	65	8.4	Female	54	Engineer	30	Normal	9
334	65	8.4	Female	54	Engineer	30	Normal	9
335	65	8.4	Female	54	Engineer	30	Normal	9
336	65	8.4	Female	54	Engineer	30	Normal	9
337	65	8.4	Female	54	Engineer	30	Normal	9
338	65	8.4	Female	54	Engineer	30	Normal	9
299	65	8.5	Female	51	Engineer	30	Normal	9
300	65	8.5	Female	51	Engineer	30	Normal	9
301	65	8.5	Female	51	Engineer	30	Normal	9
302	65	8.5	Female	51	Engineer	30	Normal	9
317	65	8.5	Female	53	Engineer	30	Normal	9
318	65	8.5	Female	53	Engineer	30	Normal	9
321	65	8.5	Female	53	Engineer	30	Normal	9
324	65	8.5	Female	53	Engineer	30	Normal	9
326	65	8.5	Female	53	Engineer	30	Normal	9
328	65	8.5	Female	53	Engineer	30	Normal	9
330	65	8.5	Female	53	Engineer	30	Normal	9
331	65	8.5	Female	53	Engineer	30	Normal	9
339	65	8.5	Female	54	Engineer	30	Normal	9

```
Sleep_health_and_lifestyle_dataset_renamed %>%
 select(ID, HRate, Duration, Gender, Age, Occupation, Physical, BMI, Quality) %>%
  arrange(Duration) %>%
  filter(Gender == 'Male')
```

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
4	85	5.9	Male	28	Sales Representative	30	Fat	4
5	85	5.9	Male	28	Sales Representative	30	Fat	4
6	85	5.9	Male	28	Software Engineer	30	Fat	4
14	70	6.0	Male	29	Doctor	30	Normal	6
15	70	6.0	Male	29	Doctor	30	Normal	6
16	70	6.0	Male	29	Doctor	30	Normal	6
18	70	6.0	Male	29	Doctor	30	Normal	6
53	72	6.0	Male	32	Doctor	30	Normal	6
55	72	6.0	Male	32	Doctor	30	Normal	6
56	72	6.0	Male	32	Doctor	30	Normal	6
58	72	6.0	Male	32	Doctor	30	Normal	6

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
59	72	6.0	Male	32	Doctor	30	Normal	6
61	72	6.0	Male	32	Doctor	30	Normal	6
62	72	6.0	Male	32	Doctor	30	Normal	6
68	72	6.0	Male	33	Doctor	30	Normal	6
75	72	6.0	Male	33	Doctor	30	Normal	6
76	72	6.0	Male	33	Doctor	30	Normal	6
77	72	6.0	Male	33	Doctor	30	Normal	6
78	72	6.0	Male	33	Doctor	30	Normal	6
79	72	6.0	Male	33	Doctor	30	Normal	6
80	72	6.0	Male	33	Doctor	30	Normal	6
1	77	6.1	Male	27	Software Engineer	42	Fat	6
11	70	6.1	Male	29	Doctor	30	Normal	6
13	70	6.1	Male	29	Doctor	30	Normal	6
34	72	6.1	Male	31	Doctor	30	Normal	6
36	72	6.1	Male	31	Doctor	30	Normal	6
37	72	6.1	Male	31	Doctor	30	Normal	6
71	72	6.1	Male	33	Doctor	30	Normal	6
72	72	6.1	Male	33	Doctor	30	Normal	6
73	72	6.1	Male	33	Doctor	30	Normal	6
74	72	6.1	Male	33	Doctor	30	Normal	6
2	75	6.2	Male	28	Doctor	60	Normal	6
3	75	6.2	Male	28	Doctor	60	Normal	6
63	72	6.2	Male	32	Doctor	30	Normal	6
64	72	6.2	Male	32	Doctor	30	Normal	6
65	72	6.2	Male	32	Doctor	30	Normal	6
66	72	6.2	Male	32	Doctor	30	Normal	6
7	82	6.3	Male	29	Teacher	40	Fat	6
188	72	6.3	Male	43	Salesperson	45	Fat	6
223	72	6.3	Male	44	Salesperson	45	Fat	6
226	72	6.3	Male	44	Salesperson	45	Fat	6
228	72	6.3	Male	44	Salesperson	45	Fat	6
230	72	6.3	Male	44	Salesperson	45	Fat	6
232	72	6.3	Male	44	Salesperson	45	Fat	6
234	72	6.3	Male	44	Salesperson	45	Fat	6
236	72	6.3	Male	44	Salesperson	45	Fat	6
239	72	6.3	Male	44	Salesperson	45	Fat	6
242	72	6.3	Male	44	Salesperson	45	Fat	6
245	72	6.3	Male	44	Salesperson	45	Fat	6
247	72	6.3	Male	44	Salesperson	45	Fat	6
192	72	6.4	Male	43	Salesperson	45	Fat	6
222	72	6.4	Male	44	Salesperson	45	Fat	6
224	72	6.4	Male	44	Salesperson	45	Fat	6
237	72	6.4	Male	44	Salesperson	45	Fat	6
240	72	6.4	Male	44	Salesperson	45	Fat	6
243	72	6.4	Male	44	Salesperson	45	Fat	6
249	72	6.4	Male	44	Salesperson	45	Fat	6

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
148	80	6.5	Male	39	Engineer	40	Fat	5
178	72	6.5	Male	42	Salesperson	45	Fat	6
190	72	6.5	Male	43	Salesperson	45	Fat	6
193	72	6.5	Male	43	Salesperson	45	Fat	6
194	72	6.5	Male	43	Salesperson	45	Fat	6
195	72	6.5	Male	43	Salesperson	45	Fat	6
196	72	6.5	Male	43	Salesperson	45	Fat	6
197	72	6.5	Male	43	Salesperson	45	Fat	6
198	72	6.5	Male	43	Salesperson	45	Fat	6
199	72	6.5	Male	43	Salesperson	45	Fat	6
200	72	6.5	Male	43	Salesperson	45	Fat	6
201	72	6.5	Male	43	Salesperson	45	Fat	6
220	72	6.5	Male	43	Salesperson	45	Fat	6
250	72	6.5	Male	44	Salesperson	45	Fat	6
104	74	6.6	Male	36	Teacher	35	Fat	5
106	74	6.6	Male	36	Teacher	35	Fat	5
83	70	6.7	Male	35	Teacher	40	Fat	7
84	70	6.7	Male	35	Teacher	40	Fat	7
248	78	6.8	Male	44	Engineer	45	Fat	7
204	69	6.9	Male	43	Engineer	47	Normal	6
138	68	7.1	Male	38	Lawyer	60	Normal	8
140	68	7.1	Male	38	Lawyer	60	Normal	8
142	68	7.1	Male	38	Lawyer	60	Normal	8
145	68	7.1	Male	38	Lawyer	60	Normal	8
168	72	7.1	Male	41	Lawyer	55	Fat	7
169	72	7.1	Male	41	Lawyer	55	Fat	7
67	68	7.2	Male	32	Accountant	50	Normal	8
87	65	7.2	Male	35	Engineer	60	Normal	8
88	65	7.2	Male	35	Engineer	60	Normal	8
147	68	7.2	Male	39	Lawyer	60	Normal	8
152	68	7.2	Male	39	Lawyer	60	Normal	8
153	68	7.2	Male	39	Lawyer	60	Normal	8
154	68	7.2	Male	39	Lawyer	60	Normal	8
155	68	7.2	Male	39	Lawyer	60	Normal	8
156	68	7.2	Male	39	Lawyer	60	Normal	8
157	68	7.2	Male	39	Lawyer	60	Normal	8
158	68	7.2	Male	39	Lawyer	60	Normal	8
159	68	7.2	Male	39	Lawyer	60	Normal	8
160	68	7.2	Male	39	Lawyer	60	Normal	8
161	68	7.2	Male	39	Lawyer	60	Normal	8
89	65	7.3	Male	35	Engineer	60	Normal	8
90	65	7.3	Male	35	Engineer	60	Normal	8
91	65	7.3	Male	35	Engineer	60	Normal	8
92	65	7.3	Male	35	Engineer	60	Normal	8
127	68	7.3	Male	38	Lawyer	60	Normal	8
129	68	7.3	Male	38	Lawyer	60	Normal	8

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
130	68	7.3	Male	38	Lawyer	60	Normal	8
132	68	7.3	Male	38	Lawyer	60	Normal	8
133	68	7.3	Male	38	Lawyer	60	Normal	8
135	68	7.3	Male	38	Lawyer	60	Normal	8
136	68	7.3	Male	38	Lawyer	60	Normal	8
167	72	7.3	Male	41	Engineer	70	Normal	8
265	83	7.3	Male	48	Doctor	65	Fat	7
267	83	7.3	Male	48	Doctor	65	Fat	7
94	84	7.4	Male	35	Lawyer	60	Fat	7
110	68	7.4	Male	37	Lawyer	60	Normal	8
112	68	7.4	Male	37	Lawyer	60	Normal	8
114	68	7.4	Male	37	Lawyer	60	Normal	8
51	70	7.5	Male	32	Engineer	45	Normal	8
52	70	7.5	Male	32	Engineer	45	Normal	8
85	70	7.5	Male	35	Software Engineer	60	Normal	8
93	70	7.5	Male	35	Software Engineer	60	Normal	8
20	70	7.6	Male	30	Doctor	75	Normal	7
38	70	7.6	Male	31	Doctor	75	Normal	7
39	70	7.6	Male	31	Doctor	75	Normal	7
40	70	7.6	Male	31	Doctor	75	Normal	7
54	70	7.6	Male	32	Doctor	75	Normal	7
166	70	7.6	Male	41	Lawyer	90	Normal	8
175	70	7.6	Male	41	Lawyer	90	Normal	8
176	70	7.6	Male	41	Lawyer	90	Normal	8
177	70	7.6	Male	41	Lawyer	90	Normal	8
205	68	7.6	Male	43	Engineer	75	Fat	8
21	70	7.7	Male	30	Doctor	75	Normal	7
22	70	7.7	Male	30	Doctor	75	Normal	7
23	70	7.7	Male	30	Doctor	75	Normal	7
24	70	7.7	Male	30	Doctor	75	Normal	7
35	70	7.7	Male	31	Doctor	75	Normal	7
41	70	7.7	Male	31	Doctor	75	Normal	7
42	70	7.7	Male	31	Doctor	75	Normal	7
43	70	7.7	Male	31	Doctor	75	Normal	7
45	70	7.7	Male	31	Doctor	75	Normal	7
47	70	7.7	Male	31	Doctor	75	Normal	7
49	70	7.7	Male	31	Doctor	75	Normal	7
50	70	7.7	Male	31	Doctor	75	Normal	7
57	70	7.7	Male	32	Doctor	75	Normal	7
60	70	7.7	Male	32	Doctor	75	Normal	7
170	70	7.7	Male	41	Lawyer	90	Normal	8
171	70	7.7	Male	41	Lawyer	90	Normal	8
172	70	7.7	Male	41	Lawyer	90	Normal	8
173	70	7.7	Male	41	Lawyer	90	Normal	8
174	70	7.7	Male	41	Lawyer	90	Normal	8
206	70	7.7	Male	43	Engineer	90	Normal	8

ID	HRate	Duration	Gender	Age	Occupation	Physical	BMI	Quality
207	70	7.7	Male	43	Engineer	90	Normal	8
208	70	7.7	Male	43	Engineer	90	Normal	8
209	70	7.7	Male	43	Engineer	90	Normal	8
211	70	7.7	Male	43	Engineer	90	Normal	8
8	70	7.8	Male	29	Doctor	75	Normal	7
9	70	7.8	Male	29	Doctor	75	Normal	7
10	70	7.8	Male	29	Doctor	75	Normal	7
12	70	7.8	Male	29	Doctor	75	Normal	7
25	70	7.8	Male	30	Doctor	75	Normal	7
27	70	7.8	Male	30	Doctor	75	Normal	7
44	70	7.8	Male	31	Doctor	75	Normal	7
46	70	7.8	Male	31	Doctor	75	Normal	7
48	70	7.8	Male	31	Doctor	75	Normal	7
108	68	7.8	Male	37	Engineer	70	Normal	8
109	68	7.8	Male	37	Engineer	70	Normal	8
179	70	7.8	Male	42	Lawyer	90	Normal	8
180	70	7.8	Male	42	Lawyer	90	Normal	8
181	70	7.8	Male	42	Lawyer	90	Normal	8
182	70	7.8	Male	42	Lawyer	90	Normal	8
183	70	7.8	Male	42	Lawyer	90	Normal	8
184	70	7.8	Male	42	Lawyer	90	Normal	8
202	70	7.8	Male	43	Engineer	90	Normal	8
203	70	7.8	Male	43	Engineer	90	Normal	8
210	70	7.8	Male	43	Engineer	90	Normal	8
212	70	7.8	Male	43	Engineer	90	Normal	8
213	70	7.8	Male	43	Engineer	90	Normal	8
214	70	7.8	Male	43	Engineer	90	Normal	8
215	70	7.8	Male	43	Engineer	90	Normal	8
216	70	7.8	Male	43	Engineer	90	Normal	8
217	70	7.8	Male	43	Engineer	90	Normal	8
218	70	7.8	Male	43	Engineer	90	Normal	8
219	70	7.8	Male	43	Engineer	90	Normal	8
26	70	7.9	Male	30	Doctor	75	Normal	7
28	70	7.9	Male	30	Doctor	75	Normal	7
29	70	7.9	Male	30	Doctor	75	Normal	7
30	70	7.9	Male	30	Doctor	75	Normal	7
164	68	7.9	Male	40	Lawyer	90	Normal	8
165	68	7.9	Male	40	Lawyer	90	Normal	8
277	86	8.1	Male	49	Doctor	85	Fat	9
278	86	8.1	Male	49	Doctor	85	Fat	9

Part4

```
Sleep_health_and_lifestyle_dataset_renamed <- Sleep_health_and_lifestyle_dataset %>%
  rename( Duration = 'Sleep Duration',
          Stress = 'Stress Level',
          Physical = 'Physical Activity Level' ,
          Quality = 'Quality of Sleep' ,
          BMI= 'BMI Category' ,
          BPressure = 'Blood Pressure' ,
          HRate = 'Heart Rate' ,
          DSteps = 'Daily Steps' ,
          Disorder = 'Sleep Disorder' )
```

```
Sleep_health_and_lifestyle_dataset_renamed$BMI[Sleep_health_and_lifestyle_dataset_renamed$BMI =
Sleep_health_and_lifestyle_dataset_renamed$BMI[Sleep_health_and_lifestyle_dataset_renamed$BMI =
Sleep_health_and_lifestyle_dataset_renamed$BMI[Sleep_health_and_lifestyle_dataset_renamed$BMI =
```

Explore dataset

```
str(Sleep_health_and_lifestyle_dataset)
```

```
## spc_tbl_ [374 x 13] (S3: spec_tbl_df/tbl_df/tbl/data.frame)
##  $ Person ID              : num [1:374] 1 2 3 4 5 6 7 8 9 10 ...
##  $ Gender                 : chr [1:374] "Male" "Male" "Male" "Male" ...
##  $ Age                    : num [1:374] 27 28 28 28 28 28 29 29 29 29 ...
##  $ Occupation             : chr [1:374] "Software Engineer" "Doctor" "Doctor" "Sales Represe
##  $ Sleep Duration         : num [1:374] 6.1 6.2 6.2 5.9 5.9 5.9 6.3 7.8 7.8 7.8 ...
##  $ Quality of Sleep       : num [1:374] 6 6 6 4 4 4 6 7 7 7 ...
##  $ Physical Activity Level: num [1:374] 42 60 60 30 30 30 40 75 75 75 ...
##  $ Stress Level           : num [1:374] 6 8 8 8 8 8 7 6 6 6 ...
##  $ BMI Category           : chr [1:374] "Overweight" "Normal" "Normal" "Obese" ...
##  $ Blood Pressure         : chr [1:374] "126/83" "125/80" "125/80" "140/90" ...
##  $ Heart Rate             : num [1:374] 77 75 75 85 85 85 82 70 70 70 ...
##  $ Daily Steps            : num [1:374] 4200 10000 10000 3000 3000 3000 3500 8000 8000 8000
##  $ Sleep Disorder         : chr [1:374] "None" "None" "None" "Sleep Apnea" ...
##  - attr(*, "spec")=
##   .. cols(
##   ..   'Person ID' = col_double(),
##   ..   Gender = col_character(),
##   ..   Age = col_double(),
##   ..   Occupation = col_character(),
##   ..   'Sleep Duration' = col_double(),
##   ..   'Quality of Sleep' = col_double(),
##   ..   'Physical Activity Level' = col_double(),
##   ..   'Stress Level' = col_double(),
##   ..   'BMI Category' = col_character(),
```

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```
##    ..   'Blood Pressure' = col_character(),
##    ..   'Heart Rate' = col_double(),
##    ..   'Daily Steps' = col_double(),
##    ..   'Sleep Disorder' = col_character()
##    .. )
##  - attr(*, "problems")=<externalptr>
```

```
head(Sleep_health_and_lifestyle_dataset)
```

Person ID	Gender	Age	Occupation	Sleep Du-ra-tion	Quality of Sleep	Physical Activity Level	Stress Level	BMI Cat-e-gory	Blood Pres-sure	Heart Rate	Daily Steps	Sleep Dis-order
1	Male	27	Software Engi-neer	6.1	6	42	6	Overweight	126/83	77	4200	None
2	Male	28	Doctor	6.2	6	60	8	Normal	125/80	75	10000	None
3	Male	28	Doctor	6.2	6	60	8	Normal	125/80	75	10000	None
4	Male	28	Sales Repre-senta-tive	5.9	4	30	8	Obese	140/90	85	3000	Sleep Ap-nea
5	Male	28	Sales Repre-senta-tive	5.9	4	30	8	Obese	140/90	85	3000	Sleep Ap-nea
6	Male	28	Software Engi-neer	5.9	4	30	8	Obese	140/90	85	3000	Insomnia

```
tail(Sleep_health_and_lifestyle_dataset)
```

Person ID	Gender	Age	Occupation	Sleep Dura-tion	Quality of Sleep	Physical Activity Level	Stress Level	BMI Cat-e-gory	Blood Pres-sure	Heart Rate	Daily Steps	Sleep Disor-der
369	Female	59	Nurse	8.1	9	75	3	Overweight	140/95	68	7000	Sleep Ap-nea
370	Female	59	Nurse	8.1	9	75	3	Overweight	140/95	68	7000	Sleep Ap-nea

Person ID	Gender	Age	Occupation	Sleep Dura-tion	Quality of Sleep	Physical Activity Level	Stress Level	BMI Cat-e-gory	Blood Pres-sure	Heart Rate	Daily Steps	Sleep Disor-der
371	Female	59	Nurse	8.0	9	75	3	Overweight	140/95	68	7000	Sleep Ap-nea
372	Female	59	Nurse	8.1	9	75	3	Overweight	140/95	68	7000	Sleep Ap-nea
373	Female	59	Nurse	8.1	9	75	3	Overweight	140/95	68	7000	Sleep Ap-nea
374	Female	59	Nurse	8.1	9	75	3	Overweight	140/95	68	7000	Sleep Ap-nea

Check summary

```
summary(Sleep_health_and_lifestyle_dataset_renamed)
```

```
##     Person ID          Gender               Age          Occupation
##   Min.   :  1.00   Length:374         Min.   :27.00   Length:374
##   1st Qu.: 94.25   Class :character   1st Qu.:35.25   Class :character
##   Median :187.50   Mode  :character   Median :43.00   Mode  :character
##   Mean   :187.50                      Mean   :42.18
##   3rd Qu.:280.75                      3rd Qu.:50.00
##   Max.   :374.00                      Max.   :59.00
##      Duration        Quality         Physical         Stress
##   Min.   :5.800   Min.   :4.000   Min.   :30.00   Min.   :3.000
##   1st Qu.:6.400   1st Qu.:6.000   1st Qu.:45.00   1st Qu.:4.000
##   Median :7.200   Median :7.000   Median :60.00   Median :5.000
##   Mean   :7.132   Mean   :7.313   Mean   :59.17   Mean   :5.385
##   3rd Qu.:7.800   3rd Qu.:8.000   3rd Qu.:75.00   3rd Qu.:7.000
##   Max.   :8.500   Max.   :9.000   Max.   :90.00   Max.   :8.000
##      BMI              BPressure            HRate           DSteps
##   Length:374         Length:374         Min.   :65.00   Min.   : 3000
##   Class :character   Class :character   1st Qu.:68.00   1st Qu.: 5600
##   Mode  :character   Mode  :character   Median :70.00   Median : 7000
##                                         Mean   :70.17   Mean   : 6817
##                                         3rd Qu.:72.00   3rd Qu.: 8000
##                                         Max.   :86.00   Max.   :10000
##     Disorder
##   Length:374
```

```
##   Class :character
##   Mode  :character
##
##
##
```

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  summarize(
    standard_deviation = sd(HRate)


  )
```
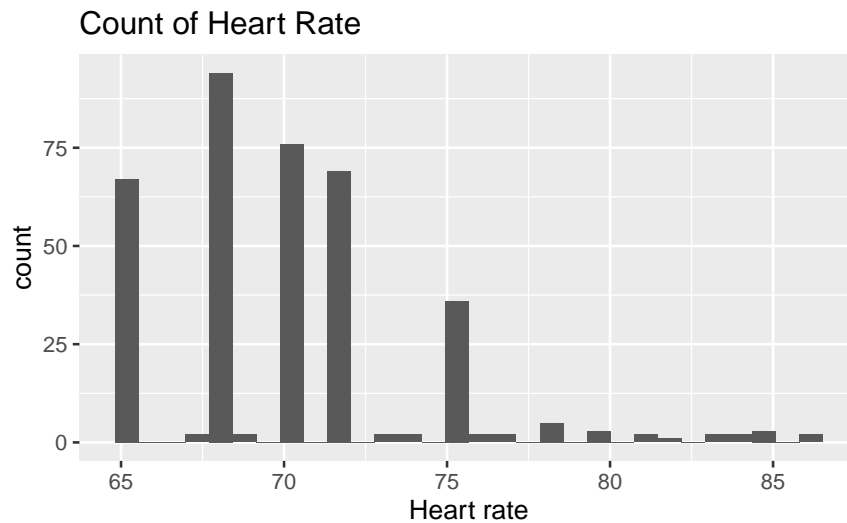
standard_deviation
4.135675

Visualizing data
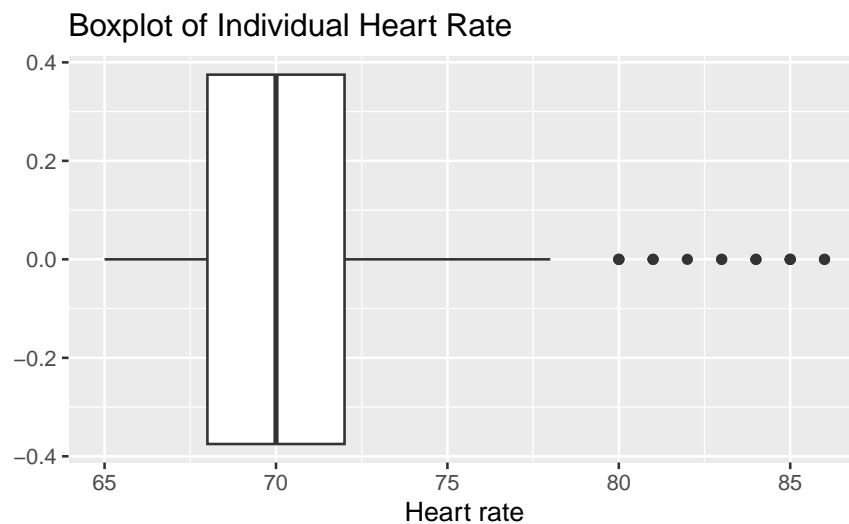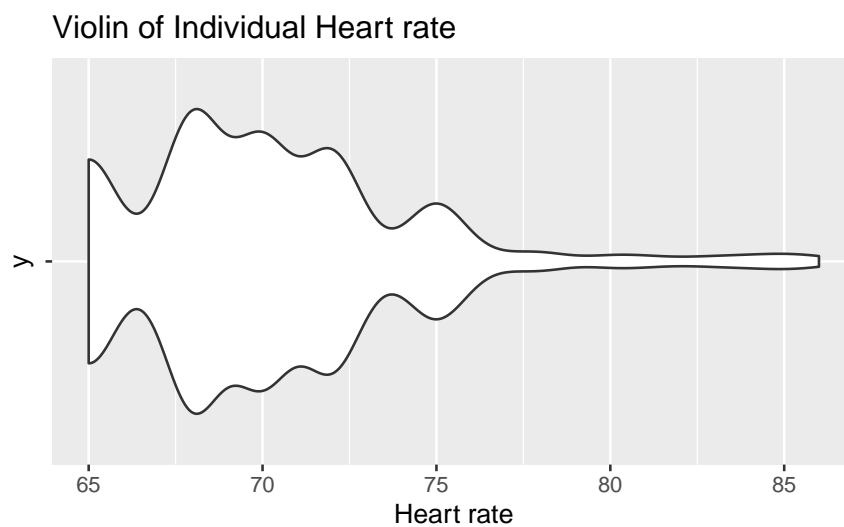
Histogram

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
    geom_histogram(mapping = aes(x = HRate)) +
    labs(title = "Count of Heart Rate", x = "Heart rate")
```
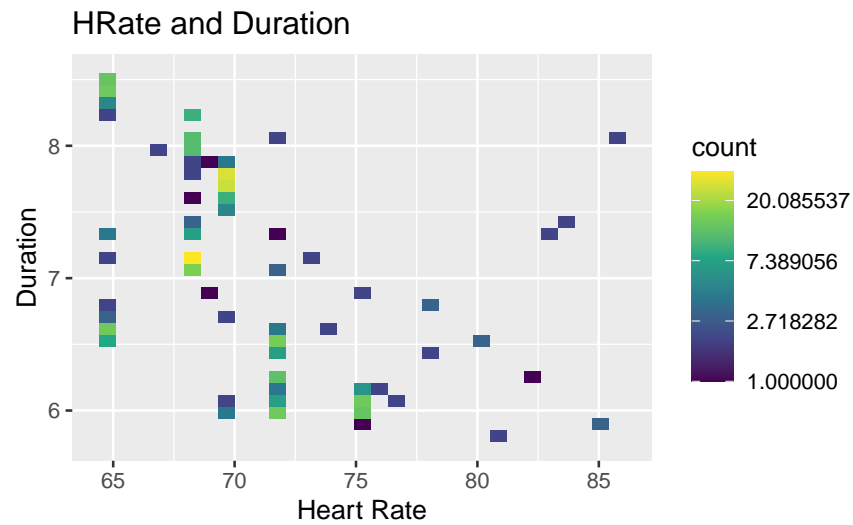
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

Box plot

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
    geom_boxplot(mapping = aes(x = HRate)) +
    labs(title = "Boxplot of Individual Heart Rate", x = "Heart rate")
```


Boxplot of Individual Heart Rate

Violin plot

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
    geom_violin(mapping = aes(x = HRate, y ="")) +
    labs(title = "Violin of Individual Heart rate", x = "Heart rate", y = "y")
```
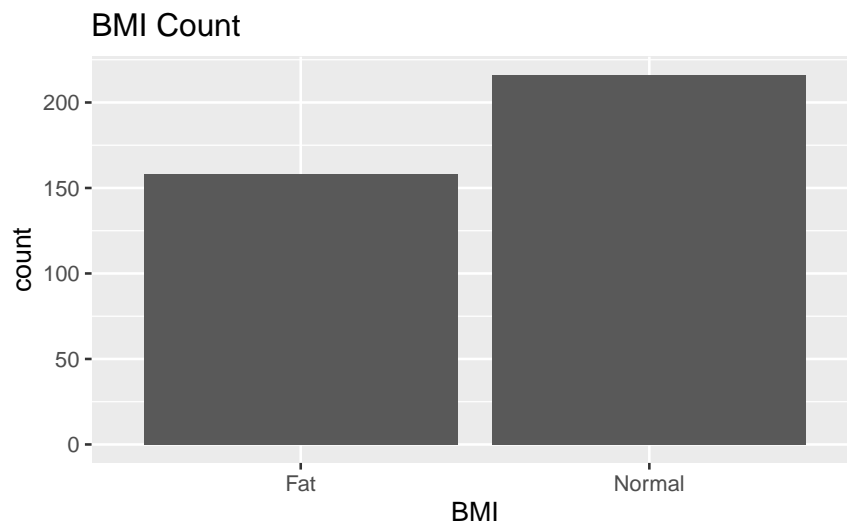

Violin of Individual Heart rate

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
  geom_bin2d(mapping = aes(x = HRate, y = Duration)) +
  labs(title = "HRate and Duration ",x = "Heart Rate",y = "Duration") + scale_fill_viridis_c(tr
```


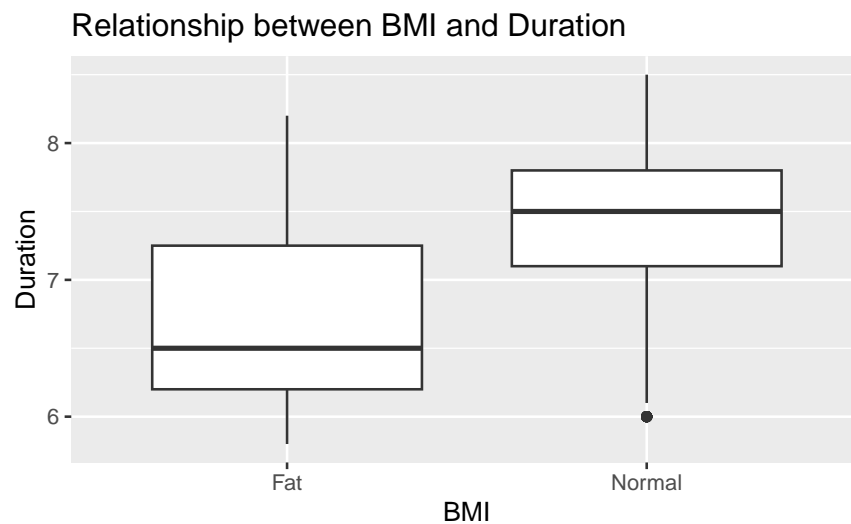## Bar Graph

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
    geom_bar(mapping = aes(x = BMI)) +
    labs(title = "BMI Count", x = "BMI")
```
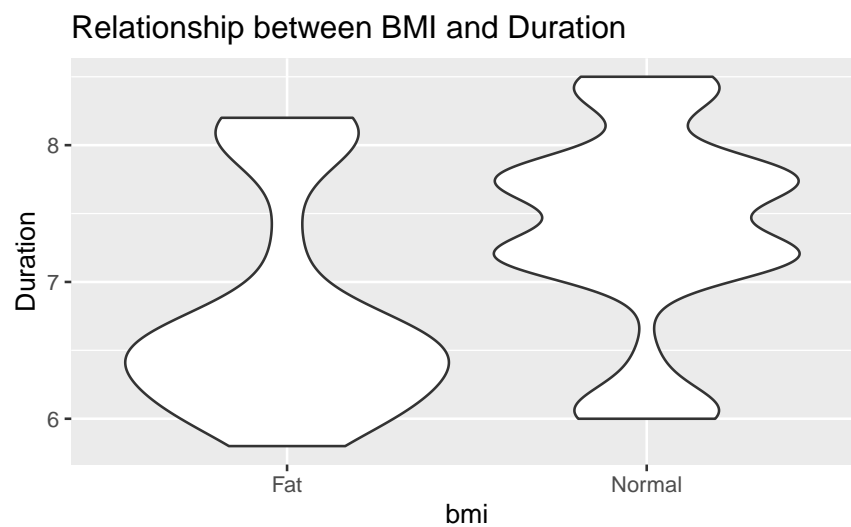
Box plot

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
    geom_boxplot(mapping = aes(x = BMI, y = Duration)) +
    labs(title = "Relationship between BMI and Duration", x = "BMI")
```
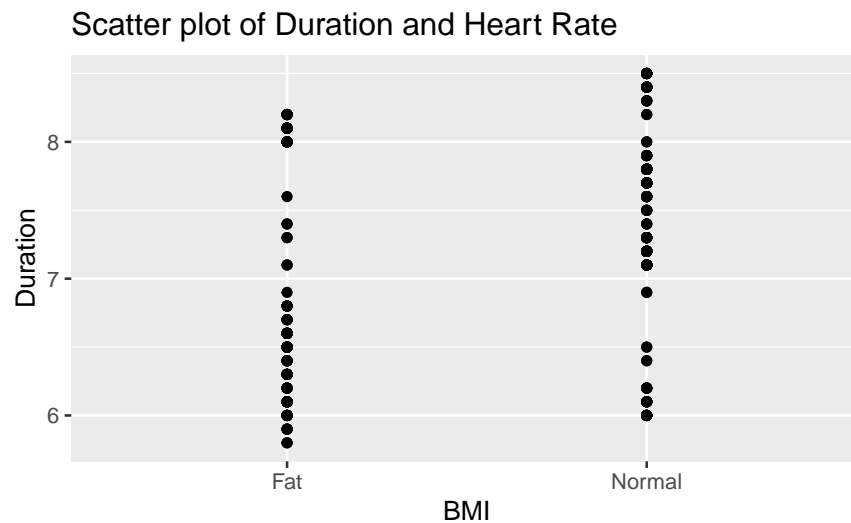

Relationship between BMI and Duration

Violin plot

```
Sleep_health_and_lifestyle_dataset_renamed %>%
  ggplot() +
    geom_violin(mapping = aes(x = BMI, y = Duration)) +
    labs(title = "Relationship between BMI and Duration", x = "bmi", y = "Duration")
```
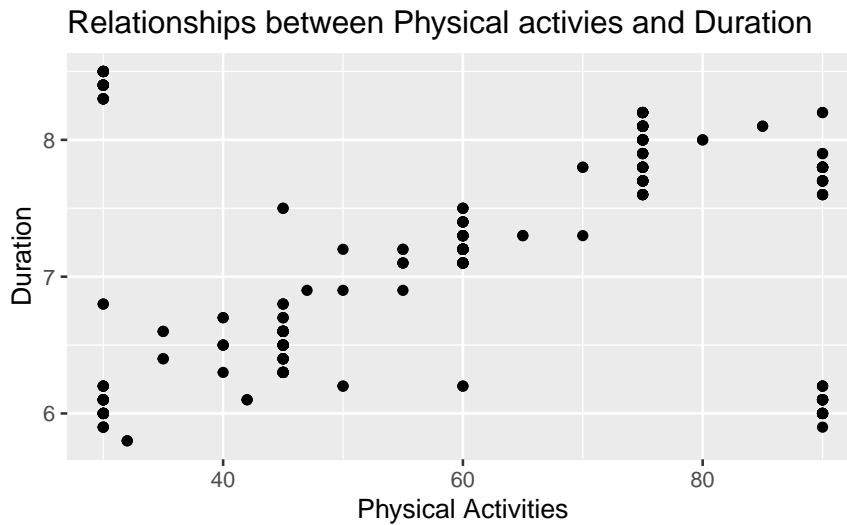

Relationship between BMI and Duration

#Scatter plot_Duration and Heart Rate

```
Sleep_health_and_lifestyle_dataset_renamed    %>%
ggplot()    +
geom_point(mapping = aes(x = BMI, y = Duration))    +
labs(
title = "Scatter plot of Duration and Heart Rate",
x = "BMI",
y = "Duration"
)
```


PART 5 __ Modeling

```
Sleep_health_and_lifestyle_dataset_renamed%>%
  ggplot()+
  geom_point( mapping = aes( x  = Physical , y = Duration)) +
  labs(title = "Relationships between Physical activies and Duration",
      x = "Physical Activities" , y = "Duration")
```

Relationships between Physical activies and Duration


```r
data <- Sleep_health_and_lifestyle_dataset_renamed

model <- lm(Duration ~ Physical, data = Sleep_health_and_lifestyle_dataset_renamed)


summary(model)
```
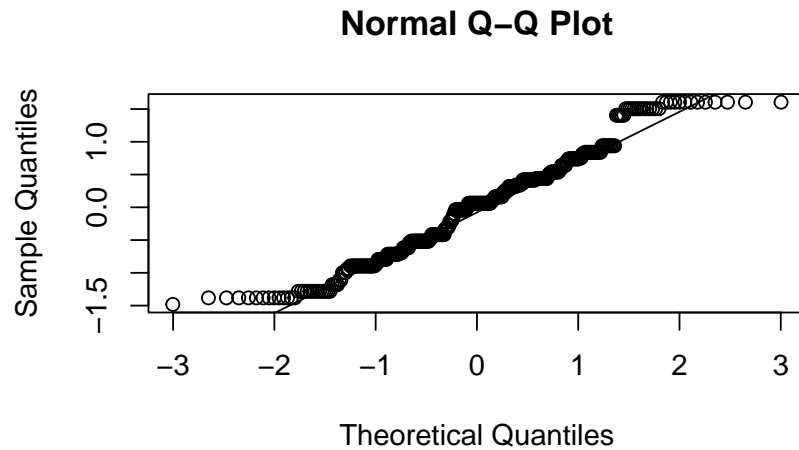
```
##
## Call:
## lm(formula = Duration ~ Physical, data = Sleep_health_and_lifestyle_dataset_renamed)
##
## Residuals:
##       Min      1Q   Median      3Q      Max
## -1.48215 -0.59686  0.06119  0.43952  1.60453
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 6.652128    0.121379  54.805  < 2e-16 ***
## Physical    0.008111    0.001935   4.191 3.47e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7786 on 372 degrees of freedom
## Multiple R-squared:  0.0451, Adjusted R-squared:  0.04253
## F-statistic: 17.57 on 1 and 372 DF,  p-value: 3.467e-05
```

```r
residuals <- residuals(model)

qqnorm(residuals)
qqline(residuals)
```

Normal Q–Q Plot


```r
labs( title  = "QQplot" , x = "Theoretical" , y = "Quantaties")
```

```
## $x
## [1] "Theoretical"
##
## $y
## [1] "Quantaties"
##
## $title
## [1] "QQplot"
##
## attr(,"class")
## [1] "labels"
```

```r
Renamed_other_model <- lm(Duration ~ Physical, data = Sleep_health_and_lifestyle_dataset_rename
```

```r
Renamed_other_model$coefficients
```

```
## (Intercept)    Physical
## 6.652127945 0.008111349
```

```r
Renamed_other_model%>%
  tidy()
```

term	estimate	std.error	statistic	p.value
(Intercept)	6.6521279	0.1213792	54.804523	0.00e+00
Physical	0.0081113	0.0019352	4.191459	3.47e-05

```
Renamed_other_model%>%
  glance()%>%
  select(r.squared)
```

r.squared
0.0450969

```
Sleep_health_and_lifestyle_dataset_renamed%>%
  ggplot()+
  geom_point(mapping = aes( x  = Physical , y = Duration) )+
  geom_abline(slope = Renamed_other_model$coefficients[2]    ,
              intercept = Renamed_other_model$coefficients[1]  )+
  labs( title = "Relationships between Physical and Duration",
        x = " Physical ",
        y = " Duration" )
```

Relationships between Physical and Duration