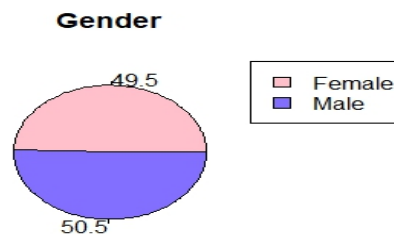


Thesis: The correlation between stress, weight and sleep in the different occupations

I created a survey under people of the most common occupations nowadays to track their sleep, activity level and stress and answer the question if short sleep is connected to higher stress levels, do we really need 8 hours of sleep and is there a correlation between sleep duration and the activity level.

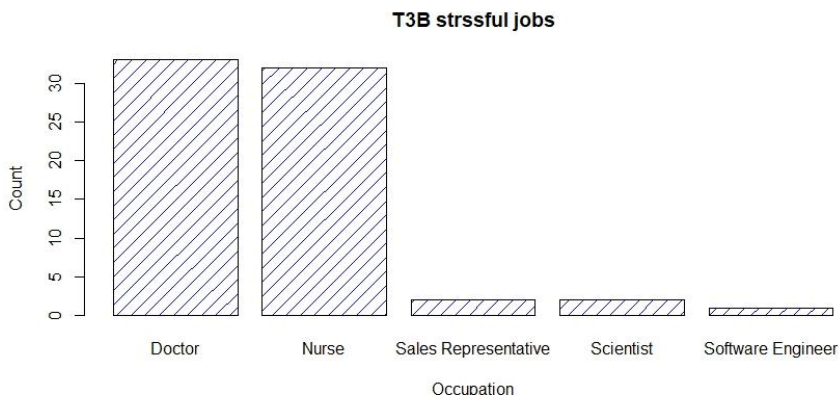
1. Males and females in the analysis.

```
genderTable <- table(health$Gender)
genderTable
genderPerc <- round(genderTable*100/sum(genderTable),1)
myColors <- c("pink", "slateblue1")
pie(genderTable, main = "Gender", labels = genderPerc, col= myColors)
legend(x="topright", legend = c("Female", "Male"), fill=myColors)
```



2. Which are the top 5 stressful occupations of this analysis?

```
stressfulJobs <- filter(a, stresslevel>7)
View(stressfulJobs)
t5b <- table(stressfulJobs$Occupation)
barplot(t5b, main = "T5B strssful jobs", xlab = "Occupation", ylab = "Count", border = "black", col="blue", density = 10)
```



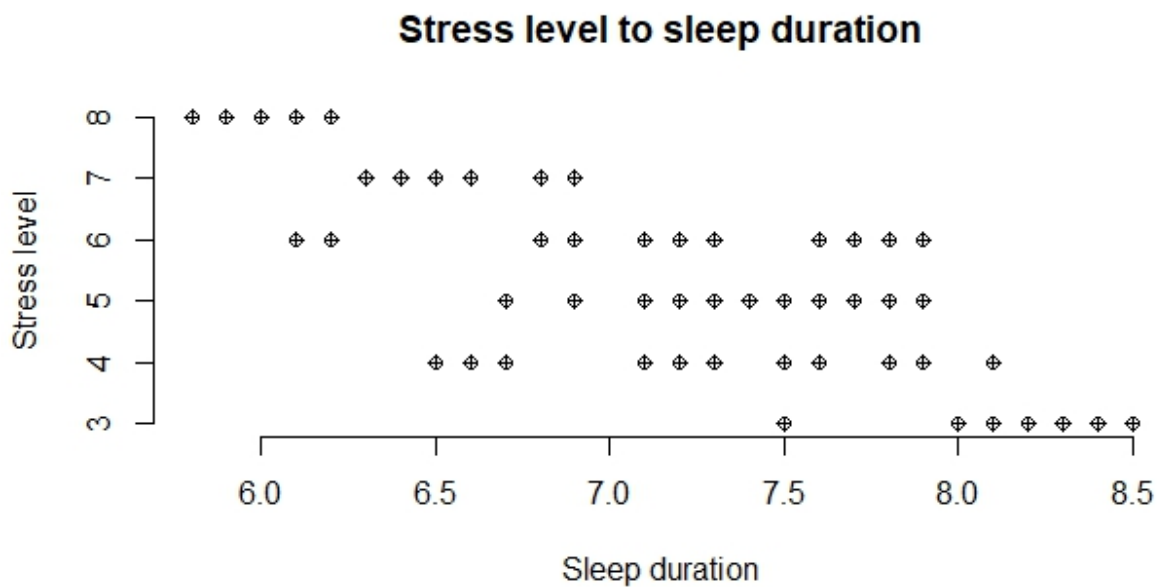
3. How is sleep duration related to the high stress levels compared to the mean sleep duration of all respondents?

First, let's take a look at the mean, from the calculations it is 7.13 h and standard deviation 0.8

```
> #3. How is sleep duration related to the high stress levels compared to the mean sleep
duration of all respondents?
> mean(health$`Sleep Duration`)
[1] 7.132086
> |

> sd(health$`Sleep Duration`)
[1] 0.7956567
> |
```

From this scatter table that shows the relation between sleep duration and stress level it is to see that the shorter the sleep the higher stress is that the person experiences during the day.



According to science, these 7 hours of average sleep should be optimal and should put the person in a healthy, calm condition. This is the result of the mean stress levels of the people in this survey who sleep over 7 hours a day.

```

> sleepOver7 <-filter(health, health$`Sleep Duration`>=7)
> mean(sleepOver7$`Stress Level`)
[1] 4.324201
>

```

Compared with the scatter table from above we can see that 7 hours of sleep could be enough and will not stress the body out, but still a value of 4 is in the middle of the stress scale and a person should aim for a couple minutes more than 7 hours.

4. Researches show that short sleep can contribute to weight gain.

This is the percentage of people from this survey who are considered “Overweight” or “Obese”. We’ll take a look at their sleep duration and activity level and later compare them to the results of the people who are with normal weight bmi.

```
> round(t*100/sum(t), 2)
```

```

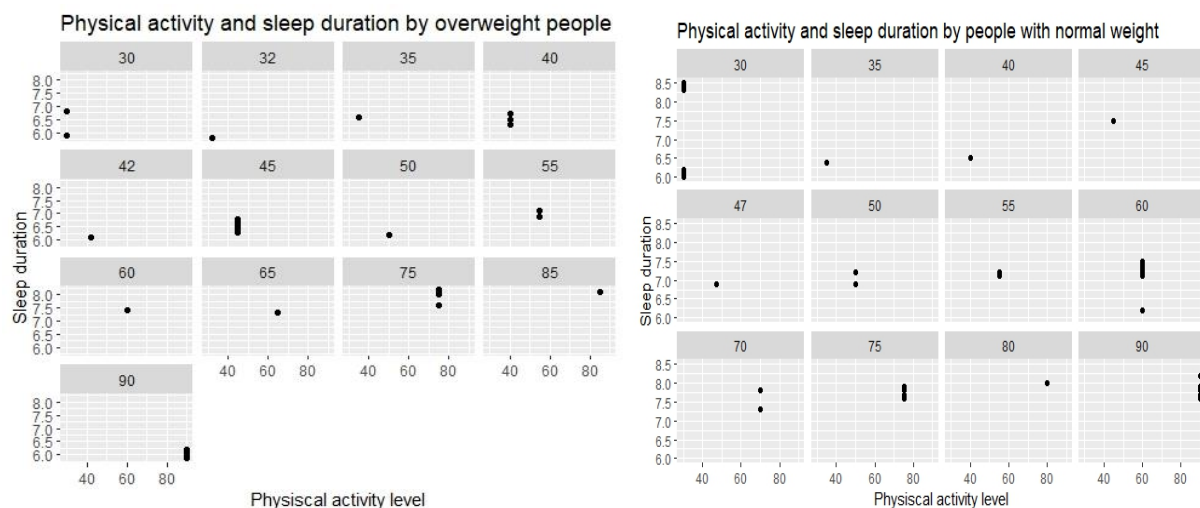
      Normal Normal weight      Obese      Overweight
      52.14         5.61         2.67         39.57
>

```

```

# variable into a factor:
> health_results$BmiCategory <- factor(health_results$BmiCategory, levels = c("Overweight", "Obese"))
+ ggplot(aes(PhysicalActivityLevel, SleepDuration)) +
+   geom_point() +
+   geom_smooth() +
+   facet_wrap(~PhysicalActivityLevel) +
+   labs(title = "Physical activity and sleep duration by overweight people", x = "Physical activity level", y = "Sleep duration")
+   geom_smooth() using method = 'loess' and formula = 'y ~ x'
>

```

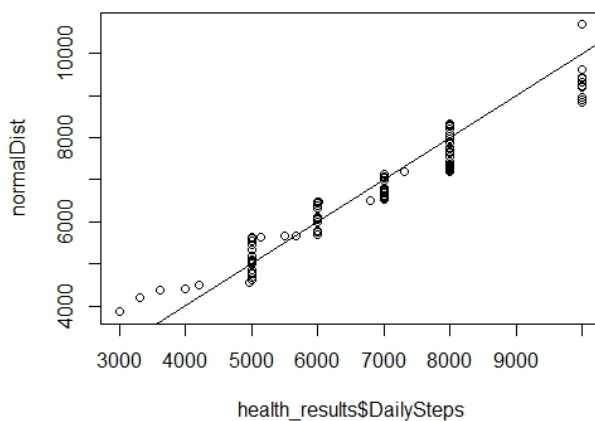


What makes an impression is that by the overweight and normal weight people who have activity level of 75 the sleep patterns are similar but the two groups who have activity level of 90 have a significant difference in the sleep duration. The people with normal weight sleep much more and this could lead to the understanding that more sleep by high intensity training can lead to maintaining lower body weight.

5. We should investigate also the daily steps that people are having and analyze if more or less steps contribute to more sleep and better quality. Firstly, with the `summary()` function we get the mean, median, max and min of the data for daily steps.

```
> summary(health_results$DailySteps)
  Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 3000   5600   7000   6817   8000  10000
> |
```

The average steps are 6817.



Here we see a normal distribution of the daily steps result. Let's see how is the average quality of sleep of the people who take 6817 steps or more compared to the average of the people who make less.

```
[1] 7.550729
> walkers <- filter(health_results, health_results$DailySteps>=6817)
> nonwalkers <- filter(health_results, health_results$DailySteps<6817)
> mean(walkers$QualityofSleep)
[1] 7.628019
> mean(nonwalkers$QualityofSleep)
[1] 6.922156
> |
```

It is obvious here that 6000 steps a day or more can contribute to better quality of sleep and if we should make a full circle and go back to the stress level, let's see the average stress level of walkers and non-walkers.

```
- -  
> mean(walkers$StressLevel)  
[1] 5.222222  
> mean(nonwalkers$StressLevel)  
[1] 5.586826  
> sd(walkers$StressLevel)  
[1] 1.660182  
> sd(nonwalkers$StressLevel)  
[1] 1.892425  
> |
```

There is a light difference in the walkers favour.

Final words:

The conclusion of this analysis would be that sleeping more than 7 hours a day and walking at least 6500 steps a day can contribute to lower stress levels.