

# Do You Have a Sleep Disorder?

Project 4

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# Why did we chose this topic?

- Believe it or not, sleep is one of the most important factors to living a healthy life!
- Sleep is something we all do as living beings
- Getting to know more about what you could be at risk of can help you get help (if needed)
- Sleep disorders are more common than you think!



# Why sleep is important

**Physical health:** Helps repair the body, supports growth in kids/teens, and boosts the immune system.

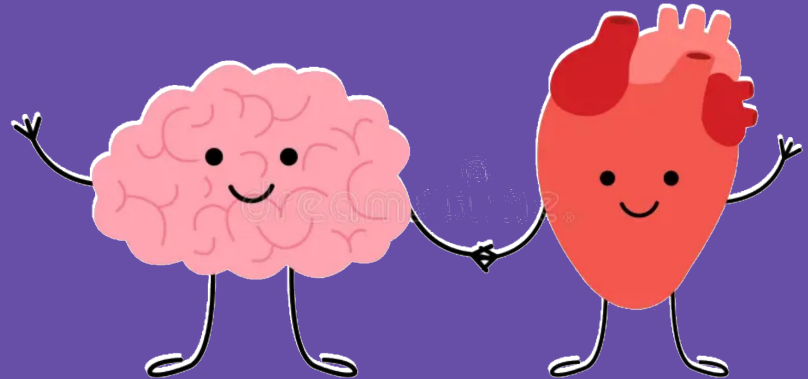
**Mental health:** Improves learning, memory, focus, and decision-making.

**Chronic health:** Good sleep lowers the risk of heart disease, diabetes, and stroke.

**Safety:** Prevents accidents, like drowsy driving.

**Mood:** Reduces stress and boosts mood.

**Weight:** Helps maintain a healthy weight.



# Most common sleep disorders

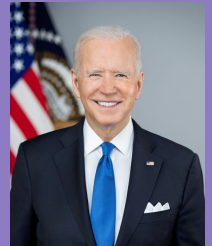
**Insomnia**- sleep disorder where you have difficulty sleeping or difficulty staying asleep.

Could be acute(short term) or chronic(long term)

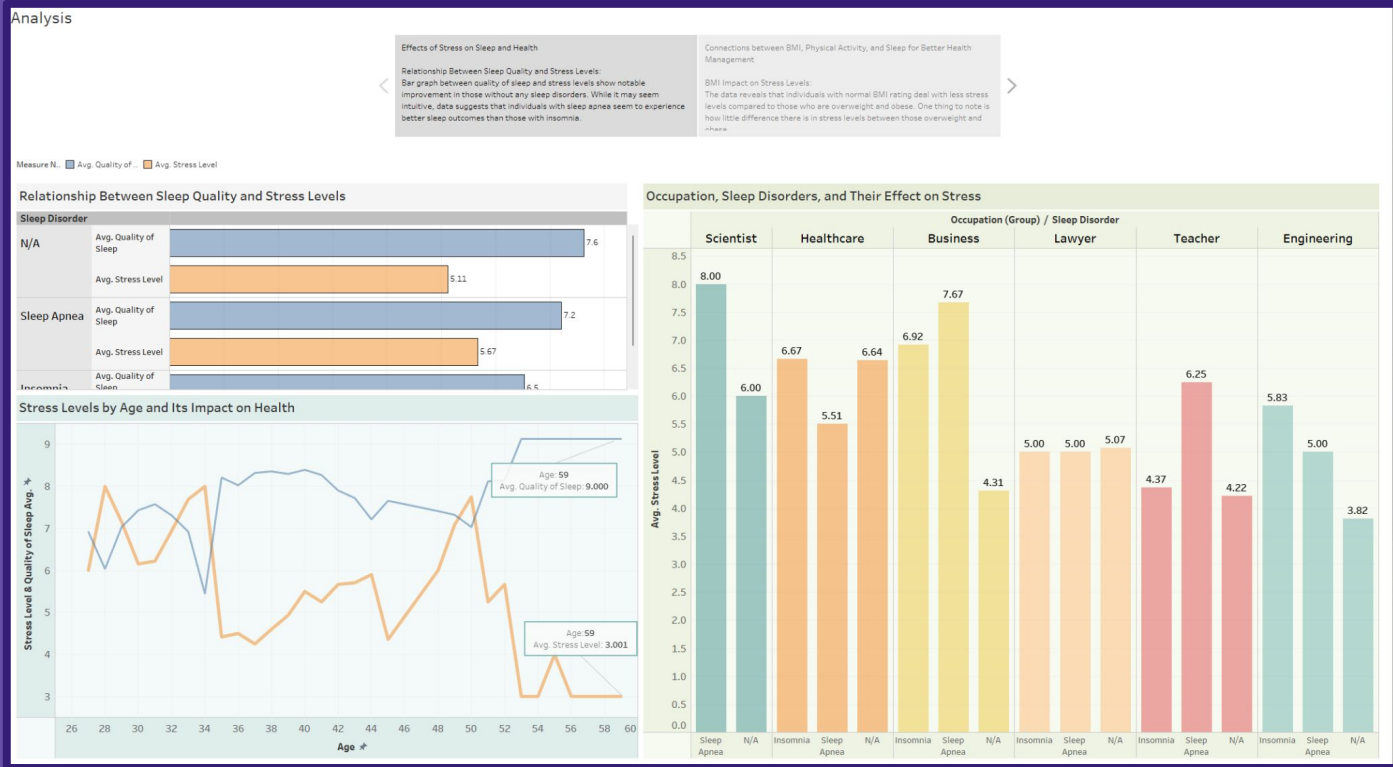


**Sleep Apnea**- sleep disorder where your breathing stops more than the normal breathing cycle

Could be caused by the natural relaxation of the throat muscle or the brain not sending the proper signals to the throat muscle



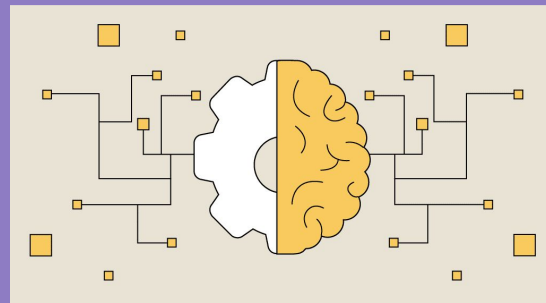
# Impact of Stress, Sleep, and Physical Health



[Image Link to Workbook](#)

# Our Machine learning model process

1. Found data set (Kaggle)
2. Clean it up
  - a. Fix dtypes (str to int)
  - b. combine categories (normal vs normal weight)
  - c. Fix null values into none
3. Create few different models (**logistic regression**, k-neighbors, random forest)
4. Add our own information and see if we have a sleep disorder



# Logistic Regression Results

- Model was most accurate in predicting no sleep disorder.
- We achieved a 90% accuracy score 😊
- The data frame on the right shows each feature's coefficient by sleeping disorder
- Largest values (positive or negative) have had the biggest impact on sleep disorder prediction.
- Quality of Sleep, Sleep Duration, and Diastolic Blood Pressure had the greatest impact on model's result.

	precision	recall	f1-score	support
Insomnia	0.81	0.89	0.85	19
Sleep Apnea	0.95	0.82	0.88	22
none	0.93	0.94	0.93	53
accuracy			0.90	94
macro avg	0.89	0.89	0.89	94
weighted avg	0.91	0.90	0.90	94

	Insomnia	Sleep Apnea	none
Age	-0.039313	0.055499	-0.016186
Sleep Duration	-0.161360	-0.176909	0.338270
Quality of Sleep	-0.211823	-0.238718	0.450542
Physical Activity Level	-0.013820	0.061809	-0.047989
Stress Level	0.141644	0.147348	-0.288992
Heart Rate	-0.153991	-0.006894	0.160885
Daily Steps	-0.000314	-0.000532	0.000846
systolic	0.040179	-0.140997	0.100818
diastolic	0.138139	0.209899	-0.348038
Gender_Female	-0.034235	0.064983	-0.030748
Gender_Male	0.029490	-0.076231	0.046741
Occupation_Accountant	0.016530	-0.020468	0.003938
Occupation_Doctor	-0.034437	-0.017020	0.051457
Occupation_Engineer	-0.046271	-0.049253	0.095525
Occupation_Lawyer	-0.009944	-0.023124	0.033067
Occupation_Manager	-0.001274	-0.001036	0.002310
Occupation_Nurse	-0.029890	0.094731	-0.064841
Occupation_Sales Representative	-0.002912	0.005368	-0.002455
Occupation_Salesperson	0.072578	-0.008508	-0.064070
Occupation_Scientist	-0.004272	0.004584	-0.000312
Occupation_Software Engineer	-0.001896	-0.000574	0.002470
Occupation_Teacher	0.037043	0.004053	-0.041095
BMI Category_Normal	-0.107672	-0.091282	0.198954
BMI Category_Obese	0.000701	0.008518	-0.009219
BMI Category_Overweight	0.102227	0.071515	-0.173742

# Lets try our model and website!

## Welcome to the Sleep Quality Analysis Tool

Analyze whether you have a sleep disorder based on quality of sleep, stress and health!

Get Started

### Input Your Data for Sleep Quality Analysis

Let's get to know you!

How old are you?	<input type="text"/>
What's your gender?	<input type="text" value="Select"/>
What's your occupation?	<input type="text" value="Select the closest one to you"/>
What's your stress level?	<input type="text" value="1 (none) to 10 (extremely stressed)"/>
What's your Physical Activity level?	<input type="text" value="1 (sedentary) to 100 (athletic)"/>
What is your Daily Steps?	<input type="text"/>
How many hours do you sleep at night?	<input type="text" value="Must be in decimal ex: 4.5"/>



# We wanted to spread a little more awareness about sleep disorders with our project

1 out of 3 Americans will experience some sort of sleep disorder throughout their lifetime, and most go undiagnosed.

Through this project, we hope to encourage everyone to reflect on their sleep patterns and habits, identify potential issues, and seek help if needed 😊

This project and machine learning model was purely for education purposes, please consult a doctor before making any medical decisions

# Thanks for Listening And Goodnight

