

Your client, SleepInc, has shared anonymized sleep data from their hot new sleep tracking app SleepScope. As their data science consultant, your mission is to analyze the lifestyle survey data with Python to discover relationships between exercise, gender, occupation, and sleep quality. See if you can identify patterns leading to insights on sleep quality.

The data: sleep_health_data.csv

SleepInc has provided you with an anonymized dataset of sleep and lifestyle metrics for 374 individuals. This dataset contains average values for each person calculated over the past six months. The data is saved as `sleep_health_data.csv`.

The dataset includes 13 columns covering sleep duration, quality, disorders, exercise, stress, diet, demographics, and other factors related to sleep health.

Column	Description
Person ID	An identifier for each individual.
Gender	The gender of the person (Male/Female).
Age	The age of the person in years.
Occupation	The occupation or profession of the person.
Sleep Duration (hours)	The average number of hours the person sleeps per day.
Quality of Sleep (scale: 1-10)	A subjective rating of the quality of sleep, ranging from 1 to 10.
Physical Activity Level (minutes/day)	The average number of minutes the person engages in physical activity daily.
Stress Level (scale: 1-10)	A subjective rating of the stress level experienced by the person, ranging from 1 to 10.
BMI Category	The BMI category of the person (e.g., Underweight, Normal, Overweight).
Blood Pressure (systolic/diastolic)	The average blood pressure measurement of the person, indicated as systolic pressure over diastolic pressure.
Heart Rate (bpm)	The average resting heart rate of the person in beats per minute.
Daily Steps	The average number of steps the person takes per day.
Sleep Disorder	The presence or absence of a sleep disorder in the person (None, Insomnia, Sleep Apnea).

```

import pandas as pd
import numpy as np

# Load data
sleep_data = pd.read_csv("sleep_health_data.csv")

# Check the columns of the dataframe
print(sleep_data.columns)

# Find average sleep duration per occupation
occ_avg_sleep = sleep_data.groupby("Occupation")["Sleep Duration"].mean()

# Find the occupation with the lowest average sleep duration
lowest_sleep_occ = occ_avg_sleep.idxmin()
print("Lowest Average Sleep Duration by Occupation:", lowest_sleep_occ)

# Find average sleep quality per occupation
occ_avg_quality = sleep_data.groupby("Occupation")["Quality of Sleep"].mean()

# Find the occupation with the lowest average sleep quality
lowest_sleep_quality_occ = occ_avg_quality.idxmin()
print("Lowest Average Sleep Quality by Occupation:", lowest_sleep_quality_occ)

same_occ = (lowest_sleep_occ == lowest_sleep_quality_occ )
print("Is it the same occupation as the one with the lowest individual record?", same_occ)

# Explore BMI Category effect on insomnia
# Calculate ratio of people in each BMI Category diagnosed with insomnia
bmi_insomnia_ratios = (
    sleep_data.groupby("BMI Category")
    .apply(lambda x: round((x["Sleep Disorder"].eq("Insomnia").mean()), 2))
    .to_dict()
)
print("BMI Category Insomnia Ratios:", bmi_insomnia_ratios)

# Rank the top 5 occupations with the most average sleep duration
top5_sleep_occ = occ_avg_sleep.sort_values(ascending=False).head(5)

# Rank the bottom 5 occupations with the least average sleep duration
bottom5_sleep_occ = occ_avg_sleep.sort_values(ascending=True).head(5)

# Display the results
top5_sleep_occ, bottom5_sleep_occ

```

Top 5 occupations with the most average sleep duration:

Occupation	...	↑↓	Sleep Duration	...	↑↓
Engineer					7.9873015873
Lawyer					7.4106382979

Accountant	7.1135135135
Nurse	7.0630136986
Doctor	6.9704225352

Rows: 5

↗ Expand

Bottom 5 occupations with the least average sleep duration:

Occupation	...	↑↓	Sleep Duration	...	↑↓	
Sales Representative						5.9
Scientist						6
Salesperson						6.403125
Teacher						6.69
Software Engineer						6.75

Rows: 5

↗ Expand

The tables above show the occupations ranked by their average sleep duration. The first table lists the top 5 occupations whose members, on average, get the most sleep. The second table lists the bottom 5 occupations whose members, on average, get the least sleep. This ranking can help identify which professions may be associated with better or worse sleep habits.