Project interpretation And Recommendation

**1. Retrieve the count of individuals grouped by gender in the Sleep\_health\_and\_lifestyle\_dataset.**

Interpretation

The results show the distribution of individuals by gender. There are 189 males and 185 females in the dataset, indicating a nearly equal representation of both genders. The slight difference suggests a balanced gender distribution in the sample.

Recommendation

The dataset shows a slightly higher count of males (189) compared to females (185), with a minimal gender imbalance. To ensure equitable representation, it's recommended to collect additional data or ensure gender diversity is balanced in future studies for more accurate and inclusive insights into sleep health and lifestyle.

**2.Find the average sleep quality for each occupation from the Sleep\_health\_and\_lifestyle\_dataset.**

Interpretation

The results show the average quality of sleep across different occupations. "Engineers" report the highest average sleep quality at 8.41, followed closely by "Accountants" (7.89) and "Lawyers" (7.89). "Nurses" also report relatively good sleep quality at 7.37. On the lower end, "Sales Representatives" have the lowest average quality of sleep at 4.00, with "Scientists" (5.00) and "Software Engineers" (6.50) also reporting lower sleep quality. This suggests that certain professions may experience better sleep quality than others, with more demanding or stressful jobs potentially linked to poorer sleep outcomes.

Recommendation

The average sleep quality varies across occupations, with Engineers (8.41) and Accountants (7.89) reporting the highest, while Sales Representatives (4.00) and Scientists (5.00) report the lowest. It’s recommended to explore factors affecting sleep quality in high-stress occupations and implement strategies to improve sleep health, especially for those with lower averages.

**3. Identify the individuals with stress levels greater than 7 and physical activity levels below 30 in the Sleep\_health\_and\_lifestyle\_dataset.**

Interpretation

The data presents individuals' sleep duration and physical activity levels across various occupations. For example, doctors tend to have a sleep duration of around 6 hours, with relatively low physical activity levels (30). Nurses, on the other hand, average a slightly higher sleep duration (around 6 hours) but have a significantly higher physical activity level (90). The sleep duration for scientists is slightly lower, averaging 5.8 hours with moderate physical activity (32). This suggests that while healthcare professionals like nurses may have higher activity levels, their sleep duration remains relatively consistent across the sample.

Recommendation

The individuals identified with stress levels greater than 7 and physical activity levels below 30 seem to be lacking adequate physical activity, which could contribute to their stress. It’s recommended to encourage regular physical exercise and stress management techniques for better overall well-being, especially for those in high-stress occupations like doctors and sales representatives.

**4.Calculate the average insurance charges for smokers and non-smokers from the insurance dataset.**

Interpretation

The results show the average insurance charges for smokers and non-smokers. Smokers have significantly higher average insurance charges at approximately 32,050, compared to non-smokers who pay around 8,434. This suggests that smoking is associated with much higher insurance costs, likely due to the increased health risks associated with smoking.

Recommendation

The average insurance charges for smokers are significantly higher at $32,050.23, compared to $8,434.27 for non-smokers. It is recommended that insurance companies consider adjusting premiums based on smoking status to better reflect the higher risk associated with smokers. Additionally, encouraging smoking cessation programs could help lower charges for smokers over time.

**5.Compare the average BMI of individuals in age groups (18-30, 31-50, 51+) from the insurance dataset.**

Interpretation

The results show the average BMI across different age groups. Individuals in the "18-30" age group have an average BMI of approximately 29.89. The average BMI increases slightly for the "31-50" age group to about 30.61, and further rises to 31.70 for those aged "51+". This suggests that BMI tends to increase with age, possibly due to changes in metabolism or lifestyle factors as individuals get older.

Recommendation

The average BMI increases with age, with individuals in the 51+ age group having the highest average BMI at 31.70, compared to 29.89 for the 18-30 group and 30.61 for the 31-50 group. It is recommended that healthcare providers offer targeted wellness programs and weight management strategies for older age groups to help mitigate potential health risks associated with higher BMI.

**6.Retrieve the region with the highest average insurance charges from the insurance dataset.**

Interpretation

The result shows that individuals in the "Southeast" region have high insurance charges, with an average of approximately 14,735. This suggests that insurance costs in this region are relatively high compared to other regions, potentially due to factors such as healthcare access, regional health risks, or cost of living.

Recommendation

The Southeast region has the highest average insurance charges at $14,735.41. It is recommended that insurers analyses the factors contributing to these higher charges, such as regional health risks or medical costs, and consider adjusting premiums or offering region-specific health programs to help reduce these costs.

**7.Find the average sleep duration for each BMI category in the Sleep\_health\_and\_lifestyle\_dataset.**

Interpretation

The results show the average sleep duration across different BMI categories. Individuals classified as "Normal Weight" have the highest average sleep duration at approximately 7.33 hours, followed closely by those in the "Normal" BMI category with an average of 7.39 hours. "Obese" individuals average 6.96 hours of sleep, while "Overweight" individuals get the least sleep, averaging 6.77 hours. This suggests that individuals with a normal BMI tend to get slightly more sleep compared to those who are overweight or obese.

Recommendation

The average sleep duration varies across BMI categories, with individuals in the "Normal" weight category getting the most sleep (7.39 hours), while those in the "Overweight" category get the least (6.77 hours). It is recommended that individuals in the "Overweight" and "Obese" categories prioritize improving sleep quality and duration, as proper rest can help with weight management and overall health.

**8.Combine both datasets to list individuals (based on age and gender) who are smokers, have a BMI over 30, and report stress levels higher than**

Interpretation

The combined dataset reveals that individuals who smoke, have a BMI over 30, and report stress levels higher than the given threshold tend to be at a higher risk for health issues. This demographic could benefit from targeted health interventions.

Recommendation

The combined dataset highlights individuals who are smokers, have a BMI over 30, and report high stress levels. It is recommended that healthcare providers focus on this group with targeted interventions, such as smoking cessation programs, stress management resources, and weight reduction strategies, to improve overall health outcomes and reduce associated risks.

**9.Classify individuals into age groups (18-30, 31-50, 51+) and retrieve the count of individuals in each group.**

Interpretation

The data represents the distribution of individuals across three age groups. The '18-30' age group has 32 individuals, the '31-50' age group has the highest count with 266 individuals, and the '51+' age group includes 76 individuals. This indicates that the majority of the population is in the '31-50' age range.

Recommendation

The data shows that the largest group of individuals falls within the 31-50 age range (266 individuals), followed by the 51+ age group (76 individuals), and the smallest group is the 18-30 age range (32 individuals). It is recommended that health programs be tailored to address the specific needs of these larger groups, with particular focus on the 31-50 age group, which represents a significant portion of the population.

**10. Classify sleep quality into "Poor" (0-3), "Moderate" (4-6), "Good" (7-10) and find the count for each.**

Interpretation

The results show the distribution of sleep quality categories among a group of individuals. Out of the total, 117 individuals fall under the "Moderate" sleep quality category, while 257 individuals have a "Good" sleep quality. This indicates that a larger proportion of individuals report better sleep quality (Good) compared to those who report moderate sleep quality.

Recommendation

The majority of individuals report "Good" sleep quality (257 individuals), while a significant number fall under the "Moderate" category (117 individuals). It is recommended to focus on improving sleep quality for those in the "Moderate" category through lifestyle interventions such as stress management, exercise, and better sleep hygiene practices to promote overall well-being.

**11.Classify BMI into "Underweight" (<18.5), "Normal" (18.5-24.9), "Overweight" (25-29.9), and "Obese" (30+) and count individuals in each category.**

Interpretation

The results show the distribution of individuals across different BMI categories. The majority of individuals are classified as "Obese" (719), followed by "Overweight" (377). A smaller group falls under the "Normal" BMI category (222), and only 20 individuals are categorized as "Underweight." This suggests that a significant portion of the population is either overweight or obese, with relatively few individuals in the underweight or normal weight ranges.

Recommendation

The majority of individuals are classified as "Obese" (719 individuals) or "Overweight" (377 individuals), while fewer fall into the "Normal" (222) or "Underweight" (20) categories. It is recommended to implement targeted health and wellness programs focusing on weight management, particularly for those in the "Obese" and "Overweight" categories, to help reduce associated health risks and improve overall well-being.

**12.Classify stress levels into "Low" (0-3), "Moderate" (4-6), and "High" (7-10) and calculate average physical activity levels.**

Interpretation

The results show the average physical activity levels across different stress level categories. Individuals with a "Moderate" stress level have the highest average physical activity (65.4), while those with "Low" stress engage in slightly less physical activity (54.7). Surprisingly, individuals with "High" stress have the lowest average physical activity (52.3), indicating that higher stress levels may be associated with reduced physical activity.

Recommendation

Individuals with "Moderate" stress levels have the highest average physical activity (65.40), followed by those with "Low" stress (54.72), and those with "High" stress (52.30). It is recommended to encourage individuals with high stress to engage in more physical activity, as exercise can help reduce stress and improve overall mental and physical health.

**13.Classify individuals into age groups (18-30, 31-50, 51+) and calculate the average insurance charges for each group.**

Interpretation

The results show the average insurance charges across different age groups. Individuals in the "18-30" age group have the lowest average insurance charges at approximately 9,398. The "31-50" age group has a higher average of about 13,281, while those aged "51+" face the highest average insurance charges, around 18,085. This suggests that insurance costs tend to increase with age, likely due to higher health risks associated with older age groups.

Recommendation

The average insurance charges increase with age, with the 51+ group having the highest average at $18,084.99, followed by the 31-50 group at $13,280.77, and the 18-30 group at $9,397.55. It is recommended that insurers consider age-based premium adjustments while offering preventive healthcare programs to help mitigate the rising costs associated with older age groups.

**14.Classify physical activity levels into "Sedentary" (<30), "Moderately Active" (30-60), and "Active" (>60).**

Interpretation

The results show the distribution of individuals across different activity levels. A total of 231 individuals are classified as "Moderately Active," while 143 individuals are considered "Active." This indicates that a larger proportion of individuals engage in moderate levels of activity compared to those who are highly active, suggesting a trend toward moderate physical activity in the group.

Recommendation

The majority of individuals are classified as "Moderately Active" (231 individuals), with a smaller group falling under the "Active" category (143 individuals). It is recommended to promote more active lifestyles by encouraging individuals in the "Moderately Active" group to increase their physical activity, potentially improving overall health and reducing long-term health risks.

**15.Classify individuals into insurance risk categories based on smoking status and BMI**

**"High Risk" (Smoker + BMI > 30)**

**"Medium Risk" (Non-Smoker + BMI > 30)**

**"Low Risk" (BMI <= 30).**

Interpretation

The results show the distribution of individuals across different risk levels. A majority of 633 individuals fall under the "Low Risk" category, while 561 individuals are classified as "Medium Risk." The smallest group consists of 144 individuals in the "High Risk" category. This suggests that most individuals in the group have a lower risk, with fewer individuals facing higher risk levels.

Recommendation

The majority of individuals fall into the "Low Risk" category (633 individuals), followed by "Medium Risk" (561 individuals), and a smaller group in the "High Risk" category (144 individuals). It is recommended to target the "Medium Risk" and "High Risk" groups with personalized interventions, focusing on smoking cessation, weight management, and lifestyle changes to reduce health risks and improve overall outcomes.

**16. Classify individuals as having or not having sleep disorders and calculate their average daily steps.**

Interpretation

The results show the average daily steps for individuals with different sleep disorder statuses. Those "Without Sleep Disorder" have an average of 6,853 daily steps. Interestingly, individuals who are "With Sleep Disorder" have two entries, with an average of 7,619 steps in one group and 5,901 steps in another. This suggests variability in physical activity levels among those with sleep disorders, with some individuals being more active than others despite the presence of a sleep disorder.

Recommendation

Individuals with sleep disorders have a lower average daily step count (5,901) compared to those without sleep disorders (6,853). It is recommended to encourage individuals with sleep disorders to increase physical activity, as regular exercise can improve sleep quality and overall health, potentially helping to manage or reduce sleep disorders.

**17. Classify individuals with children into discount categories and calculate their average insurance charges:**

**"No Discount" (0 children)**

**"Basic Discount" (1 child)**

**"Standard Discount" (2 children)**

**"Premium Discount" (3+ children).**

Interpretation

The results show the average insurance charges across different discount categories. Individuals with "No Discount" have an average insurance charge of approximately 12,366. Those with a "Basic Discount" pay slightly more, with an average of 12,731. As the discount level increases, so do the insurance charges, with "Premium Discount" averaging 14,576, and "Standard Discount" having the highest average at about 15,074. This suggests that higher discounts are associated with higher insurance charges, possibly due to more comprehensive coverage or benefits.

Recommendation

The average insurance charges increase with the number of children, with the "Standard Discount" (2 children) and "Premium Discount" (3+ children) categories having the highest charges. It is recommended to review and adjust insurance pricing models, ensuring they reflect the financial impact of having children, while potentially offering more tailored discounts to ease the burden for families with multiple children.

**18.Classify individuals into risk profiles based on stress levels and sleep quality:**

**"High Risk" (Stress > 7 and Sleep Quality < 4)**

**"Moderate Risk" (Stress 4-7 and Sleep Quality 4-7)**

**"Low Risk" (Stress <= 3 and Sleep Quality > 7).**

Interpretation

The results show the distribution of individuals across different risk profiles. A total of 250 individuals are classified as "Low Risk," while 124 individuals fall under the "Moderate Risk" category. This indicates that a larger proportion of individuals have a low risk profile compared to those who are considered to be at moderate risk.

Recommendation

The majority of individuals fall into the "Low Risk" category (250 individuals), followed by "Moderate Risk" (124 individuals). It is recommended to focus on the "Moderate Risk" group by promoting stress management techniques and improving sleep quality to help reduce health risks and improve overall well-being.

**19.List the average insurance charges for individuals grouped by gender from the Sleep\_health\_and\_lifestyle\_dataset.**

Interpretation

The results show the average insurance charges for different genders. On average, males have insurance charges of approximately 12,900, while females face higher average charges of about 15,361. This suggests that, in this dataset, female individuals tend to have higher insurance charges compared to their male counterparts.

Recommendation

The average insurance charges for females ($15,360.77) are higher than for males ($12,899.65). It is recommended that insurance providers review the factors contributing to these gender-based differences and consider adjusting premiums or offering gender-specific health programs to ensure fairness and address any underlying health risks.