**QMM1001 Case Study 2 [20%]**

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# Introduction

From 8th January 2024 to 17th April 2024 I gathered personal data to analyze my daily activities. I recorded each day for the dates mentioned above for the following task variables:- Hours spent on Zoom where I attend my college online classes as well as in-person classes, Time invested in studying(in hrs), sleeping hours, number of times I have filled my water bottles(in whole numbers ), whether I have listened to music or not on that particular day(Whether 0 or 1), How did the overall day go( Average, Busy, Happy, Sad,), Happiness on the scale of 1 to 5, number of steps I walked ( whole numbers).

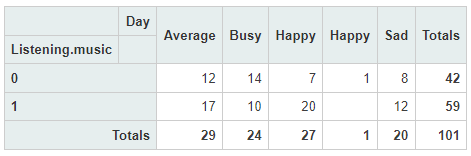
I chose the last three variables as one is a nominal categorical variable which is the Overall Day spent, the selection was based on how I could get to know how the overall day went on the particular date as well as what the circumstances contributed this to happening. The second one is the Happiness Scale which ranges from 1 to 5 with 1 being the lowest this was chosen to know how happy I was on that day as well as I was interested in this factor as I wanted to know if the overall day had any connection to the happiness level. The last Quantitative variable of my choice was Steps taken as we can analyze if the physical activities have been less on any day and if they did then what led to this.

I feel Listening to Music has a very positive effect on how I spend my overall day, increases concentration, and relaxes my mind. It enhances my overall productivity and engagement with daily tasks. Based on the data, my music-listening habits seem to be consistent with the general population, as I listen to music about the same amount as most people. This suggests that my habits are within a typical range compared to others.

# Data Analysis

I chose the categorical variable “Day” with categories “Busy”, “Average”,” Sad”, and” Happy” because it incorporates classifications like "busy," "average," "happy," and "sad" since it captures the range of experiences and emotional state of mind that a person could come across in a particular day. This let me investigate how these differences in day-to-day experiences could affect additional aspects of behavior. The terms "busy," "average," "happy," and "sad" are examples of the common ways in which people characterize their everyday activities and feelings, offering a thorough and realistic picture of their day. The reason I related this categorical variable (Day) to Listening to Music is because a popular method for controlling emotions is music. Music can be listened to to improve or alter one's mood. For example, people who are depressed might listen to uplifting music to elevate their spirits, while others might listen to upbeat music to keep their positive vibes going. Whether music serves as entertainment in the foreground or as background depends on the day of the week. While working or completing other duties on an average day, music may be played in the background; yet, on happy or sad days, music may take center stage as a means of enhancing or coping with feelings.

Contingency Table



Question 1 is did not listen to music? This question sheds light on how likely it is that I haven't listened to music. There's a greater chance that some factors are preventing me from listening to music.

Probability Notation:-

P(not listening. music) = 0.4158416 this means that 41.5% of the time I don’t listen to music in a day which can also mean other activities might be taking up a substantial amount of time in their day. This could include work, study, chores, or other tasks.

Question 2 is the probability of not listening to music or having a busy day, this

question focuses on how busy days might impact music listening habits.

Probability Notation:-

P(not.listening.music or Busy) =P(not.listening.music) +P(Busy) - P(not.listening.music and Busy)

P(not.listening.music or Busy) = 0.5148515 This probability indicates being busy or not listening to music is a common aspect of daily life. This could mean that a busy schedule affects music listening habits, or that I choose not to listen to music when I am having a busy day.

Question 3 is the probability of listening to music GIVEN you spent the day happily, this question helps us understand how spending the day happily influences the likelihood of listening to music.

Probability Notation:-

P(listening. music | Happy ) = 0.7407407 this suggests a strong positive relationship between spending the day happily and listening to music. This High probability implies that I tend to listen to music more when I am having a happy day as it enhances my mood.

Question 4 is the probability of listening to music and having a happy day? this means the question provides insight into the joint occurrence of listening to music and experiencing a happy day.

Probability Notation:-

P(listening.music AND happy) = P(listening.music) x P(listening.music | happy)

= 0.1980198

This probability approximately 19.8%, represents the probability that I both listen to music and experience a happy day. There is a moderate relationship between listening to music and experiencing a happy day. The association between listening to music and having a happy day could imply that music serves as an enhancer of positive emotional states. One may use music to sustain or amplify their happiness.

Disjoint Events

Listening to music and a day happily Spent aren’t disjoint events because they aren't equal to 0 it suggests that there is a relationship between the two events and that they can occur together. Music can serve as an emotional booster, allowing me to relish and enjoy happy moments even more. After a period of focused work, taking some time to enjoy music can add pleasure to my day and help me feel more balanced. Music can stimulate creativity and help me think more freely. I enjoy creative activities after studying, listening to music can help inspire and energize. Additionally, Walking with music provides me with a time for self-reflection and relaxation. It can be my time to unwind and disconnect from other distractions.

Independent Events

If P(listening. music) x P(happy) = P(listening. music AND happy) then these two events are independent otherwise are not independent. The value of

P( listening.music AND happy ) = 0.1980198

P(listening.music) x P(happy) = 0.1561612

As they are not equal they are not independent events, also can be called dependent events. It implies that the occurrence of one event does affect the occurrence of the other.

Since the events are dependent, listening to music and having a happy day may influence each other. For instance, listening to music could enhance my mood and contribute to having a happy day. Since listening to music and having a happy day are related, I might schedule music breaks during the day to help keep my spirits high and maintain productivity. I might also use music as a reward after completing tasks or assignments, especially on happy days. The dependency may allow me to use music as a tool for emotional management. For instance, if listening to music helps sustain my happiness.

**Part 2 :**

The number of days I listened to music is 59 and the number of days I did not listen to is 42, with these numbers and sample size I have calculated a sample proportion of approximately 58.4% which is slightly less If we compare it with the general Canadian population that contributes 59%. Since my sample proportion is lower than the population proportion I listen to music less frequently than the general Canadian population This could be due to individual preferences, daily routines, or other factors like studies, assignments, classes, or spending a significant amount of time walking outside each day influencing my music listening habits. Overall, my sample proportion is

close to the population proportion indicates that my music-listening habits are relatively similar to those of the general Canadian population.

The 95% confidence interval ranges from approximately 48.8% to 68%. This means I can be 95% confident that the true population proportion of days I listen to music lies within this range. The confidence interval does include 50% (0.50) since the lower bound (48.8%) is less than 50% and the upper bound (68%) is greater than 50%.

This suggests that I listen to music around 50% of the time or possibly more than 50% of the

time.

The mean and standard deviation values of the normal model are 0.5841584 and 0.4953247, I got 0.4524935 probability which is less than the sample proportion i.e. 0.5959596, based on this probability there is enough evidence to suggest that I Listen to music slightly less or approximately similar to the general Canadian population. Therefore, I can conclude that my listening to music habits are similar to those of the general population.

Null Hypothesis :- P = 0.59

the proportion of listening to music is equal to that of the general Canadian population (59%).

Alternate Hypothesis: -

p < 0.59

I listen to music less often than the general Canadian population. Since my sample proportion is less than the general population's proportion, this is a one-tailed test.

After conducting hypothesis testing, I got a p-value of 0.4524935 since the p-value is less than the significance level, I rejected the null hypothesis, suggesting my music listening habits are significantly different from those of the general Canadian population.

# Conclusion

Based on my data and analysis, it seems that music listening may have a positive impact on how I spend my day. The data can indicate that music listening affects my mood, energy, or productivity, which might affect the activities I decide to do during the day.

The results of the analysis comparing my music-listening habits to the general population suggest that I listen to music similar to the general Canadian population. This conclusion is based on the proportion of time I spend listening to music about the general population's music-listening habits.

By completing this report, I have gained a better understanding of how music plays a role in my daily life and habits. I have discovered that listening to music influences various aspects of my day, such as my productivity, focus, and emotional state, specifically, I have found that music has a positive effect on my studies by enhancing my focus and productivity. Additionally, the comparison with the general population has helped me better understand that my music-listening habits are mostly similar to theirs. Overall, this process has provided me with insights into the potential benefits and drawbacks of incorporating music into my daily routine and has made me consider how I might adjust my habits for a more balanced and fulfilling day.