Music Preferences among University Students

MA 213 C3G4

5 Questions:

1. How does the number of hours students spend listening to music affect their GPA?

2. Correlation between music genre preference and major

3. Is listening to music associated with some activity (e.g. studying, resting)?

4. Correlation between music preferences and region of origin

5. How age influences music preferences?

Hypothesis

1. How does the number of hours students spend listening to music affect their GPA?

Hypothesis:
i. There is a clear correlation between time spent listening to music and a student's GPA score.
ii. Time spent listening to music has no effect on GPA.

2. Correlation between music genre preference and major

Hypothesis:
i. Students with similar majors tend to listen to the same music genres.
ii. There is no correlation between a student's major and GPA.

3. Is listening to music associated with some activity (e.g. studying, resting)?

Hypothesis:
i. There are some activities that stand out (e.g. everybody listens to music while doing them, no one listens to music while doing them).
ii. The correlation between activities and music depends on personal preferences.

Hypothesis

4. Correlation between music preferences and region of origin.

Hypothesis:
i. People of the same origin tend to listen to similar music.
ii. There is no association between these two variables.

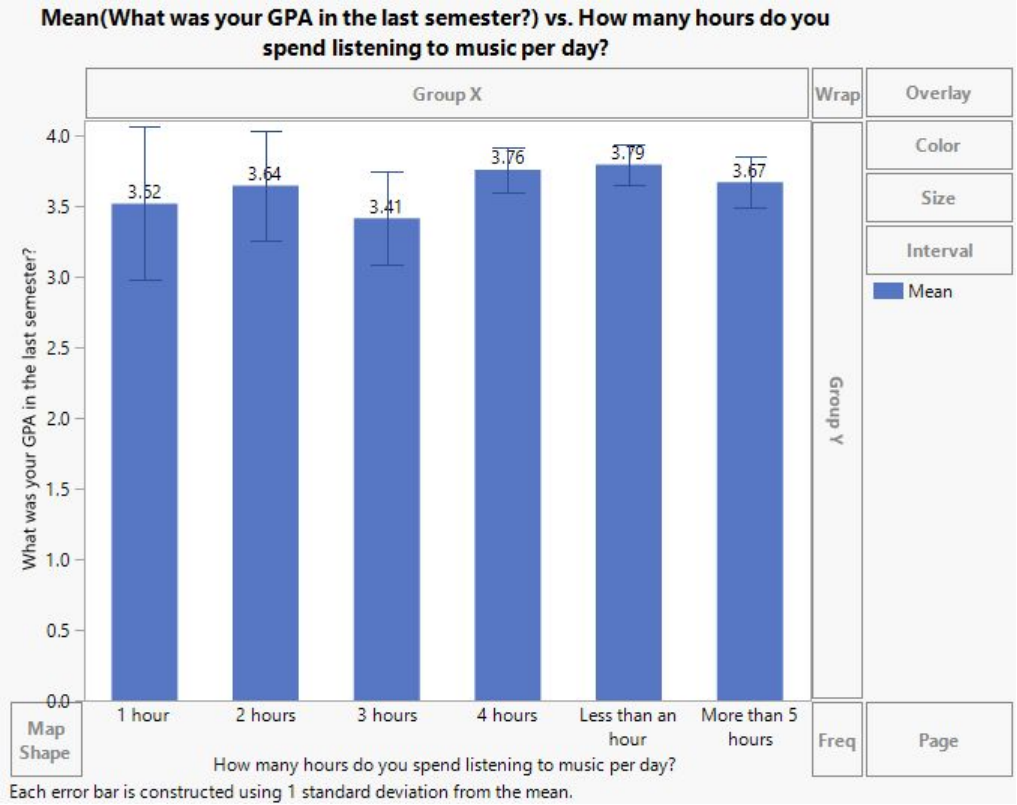
5. How age influences music preferences?

Hypothesis:
i. Music preferences change over time.
ii. There is no significant correlation between age and music preferences

Data Collecting Method

- Data collection method: survey (main one), direct observation (alternative)
- Send to all classmates in MA 213
- Send to the group chat in other classes in BU
- Population: all BU students
- Sample: Students in our class

Data Analysis



How does the number of hours you spend listening to music affect your GPA?

Students spend between 1 to 5 or more hours listening to music everyday.

As it can be observed from the graph above, time spent on music **does not impact** the students' GPA in a major way.

Students score approximately the same GPAs without high disparities. The outliers that can be found are from students who are attending their first semester at BU and do not have a GPA to report yet.

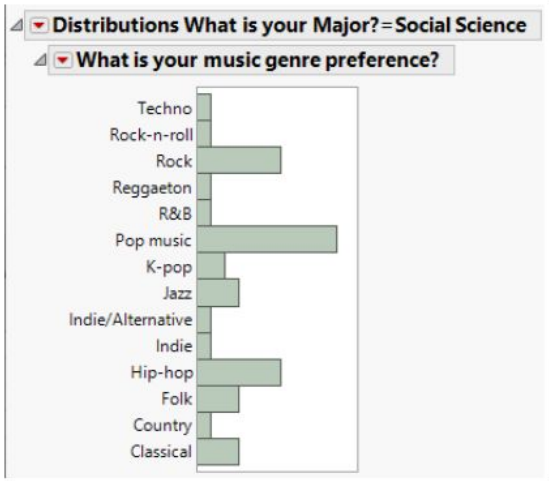
What's your music genre preference and your major's category?

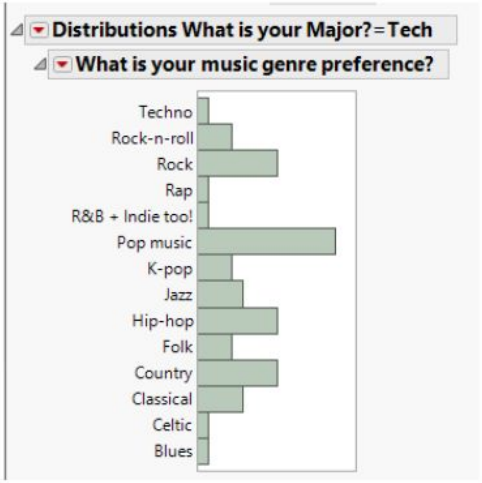
The above graphs show the correlation between the students music genre preference and their major's category. The students of MA 213 class could be classified into 3 categories; **Social Science, Tech, and Undeclared.**

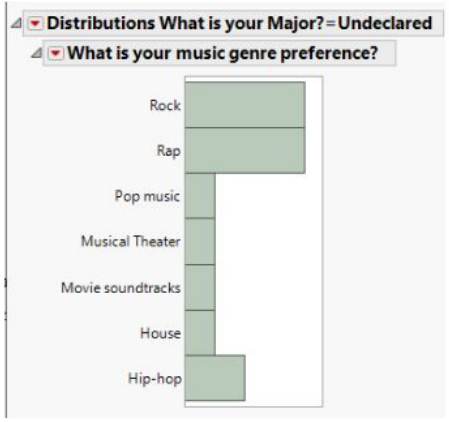
We can observe that most students in the **Tech and Social Science category** have a high preference towards pop music, rock, and hip-hop genres.

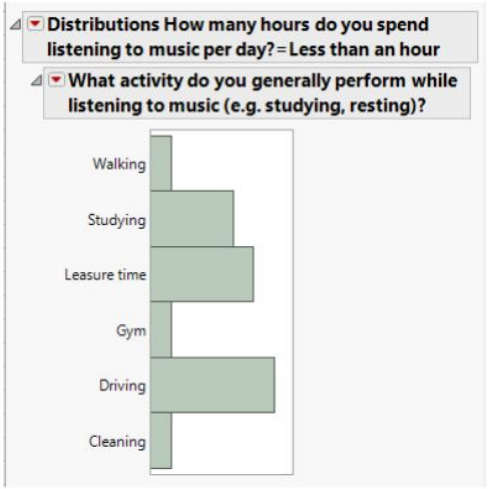
It can also be observed that a considerable amount of students in the **Social Science major** category prefer older music like folk, classical, reggaeton, and jazz. We can also notice that the **Tech major category** students are the only ones that have a preference towards celtic, blues, and R&B + Indie genres.

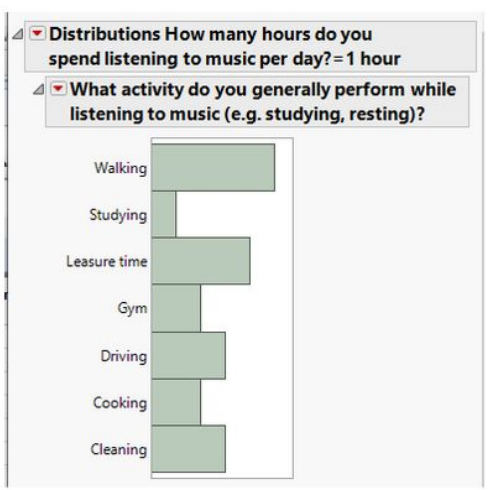
The **Undeclared major category** students have an equal preference towards rock and rap, followed by hip-hop. This group of students have the least diversity in music genre preference among the three categories mentioned above.

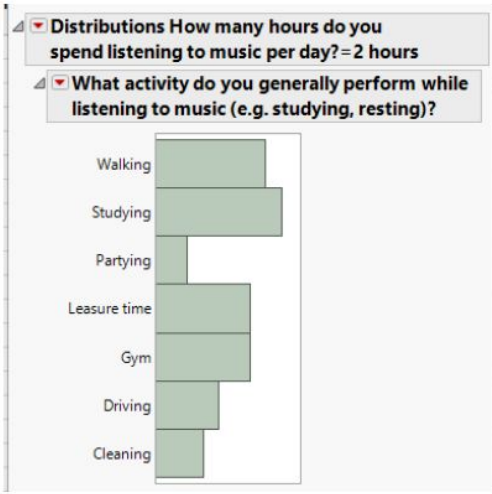


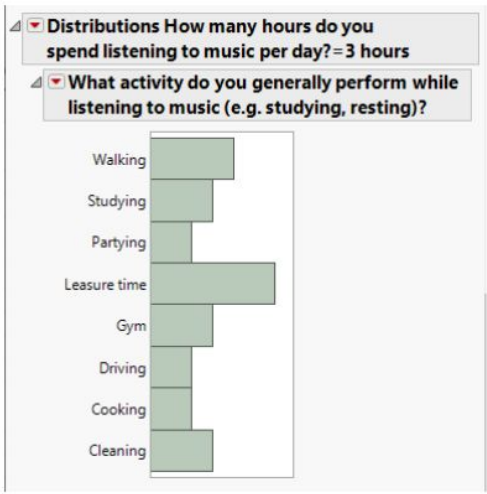


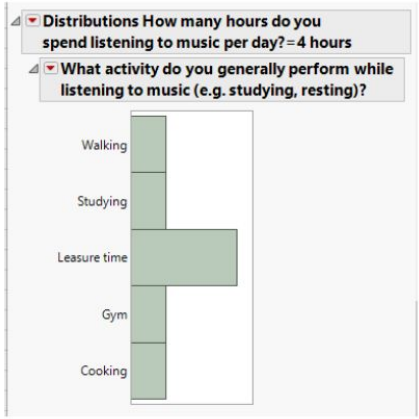


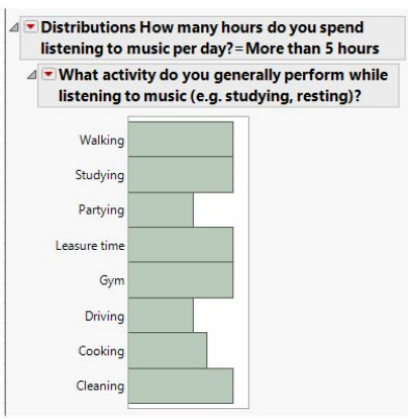








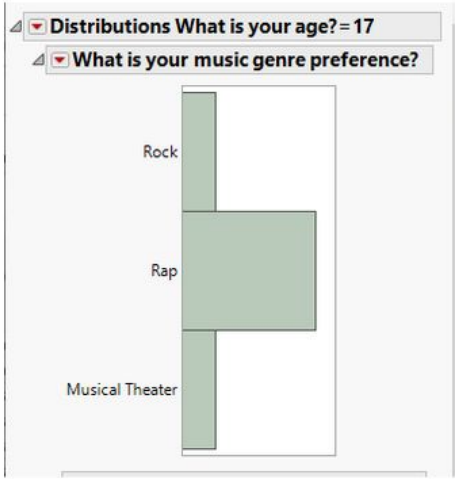


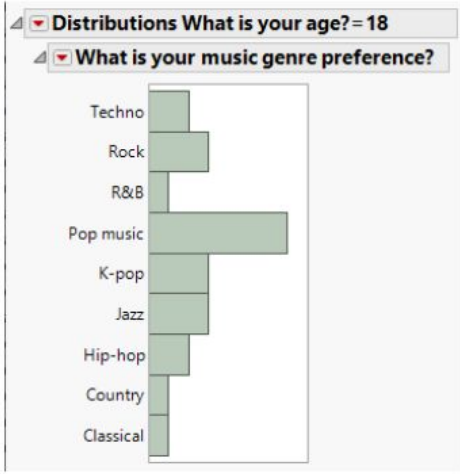


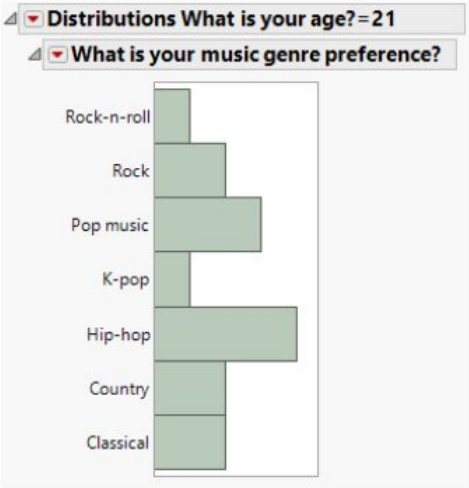
Most popular activities associated with listening to music:

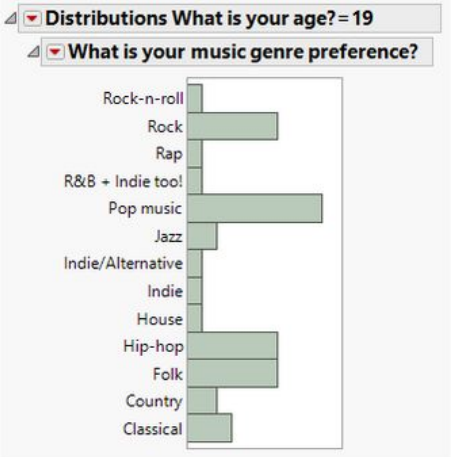
The most common activity associated with music is leisure time. There is a pattern between the number of hours spending on listening to music and activities.

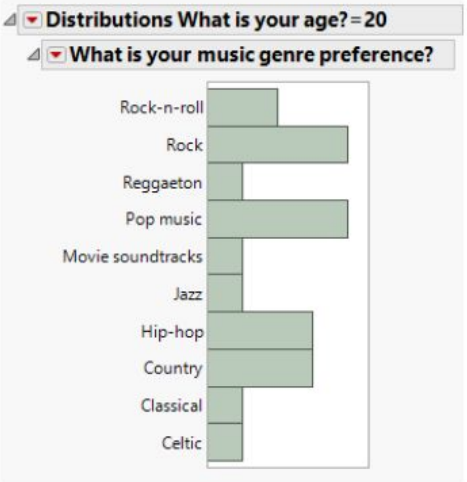
When people listen to music for less than 3 hours, a specific activity is outstanding, such as walking, leisure time and driving. When people spend around 4 hours, except one outstanding activity, others start to become average. When people spend more than 5 hours on music, almost all activities tend to be average.





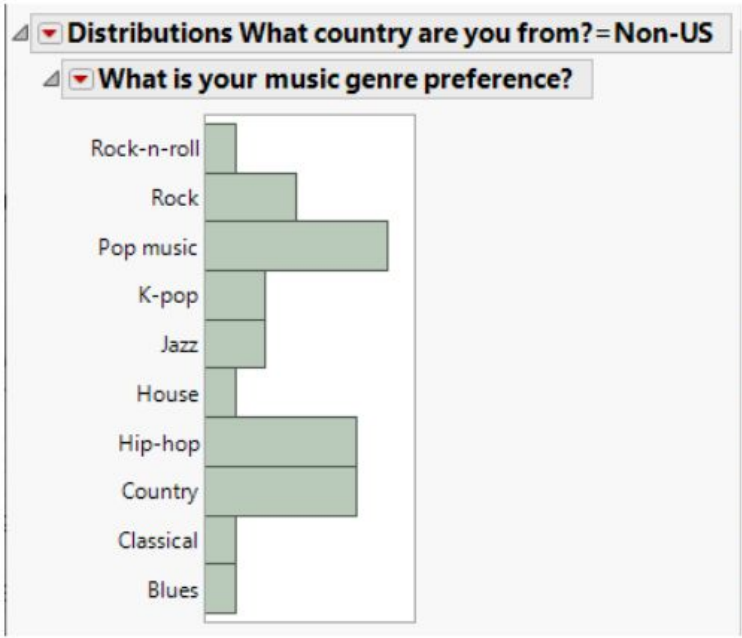


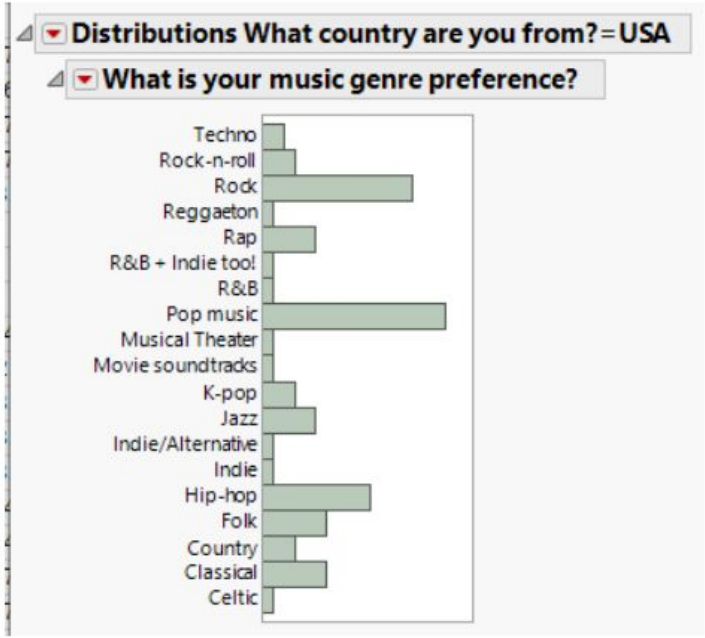




Correlation between music genre and age:

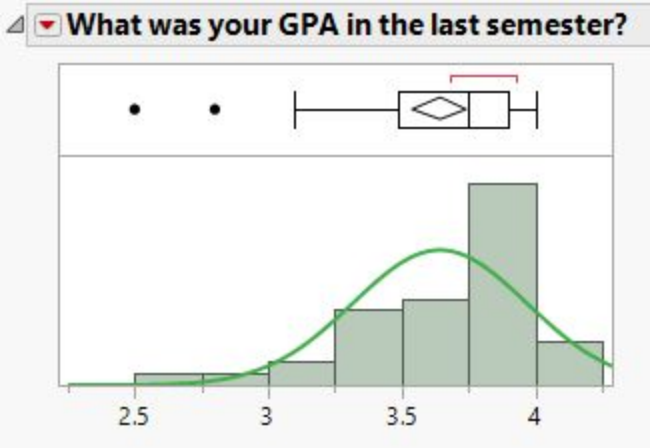
In the analysis of the data for age distribution, we found one outlier - age of 22 years old. Only two people were of this age, so we disregarded it in our final analysis. We can see that people of smaller age have less diversity in their music preferences compared to older students (e.g. for people of age 17, there are only 3 prominent music genres, with rap dominating the graph). Again, the overall most popular music genres were pop music and rock, however, genres such as hip-hop, country, and folk were
prominent for some age groups.





Correlation between music genre and region of origin

For the analysis of the correlation between music genre and region of origin, we divide people into two categories: Non-US and USA. The reason that we categorize people like this is because either dividing USA people by states or dividing other people by countries, there is not enough data to support. From the above graph, we can see that pop music is popular in both categories, and for non-US, mainly Asian in our data, hip-hop and country music are in higher preference than for people from the USA. Alse, for people from the USA, the most popular music genre other than pop music is Rock.



Normally Distributed Variable:

The p-value is less than 0.001, which means we need to reject the null hypothesis - it's normally distributed.

However, since we only have a sample size around 40, which is not a large sample size. Also, the survey is generally taken by students from introductory courses like MA 213. Generally we believe that GPA should be normally distributed.

Random Sampling:

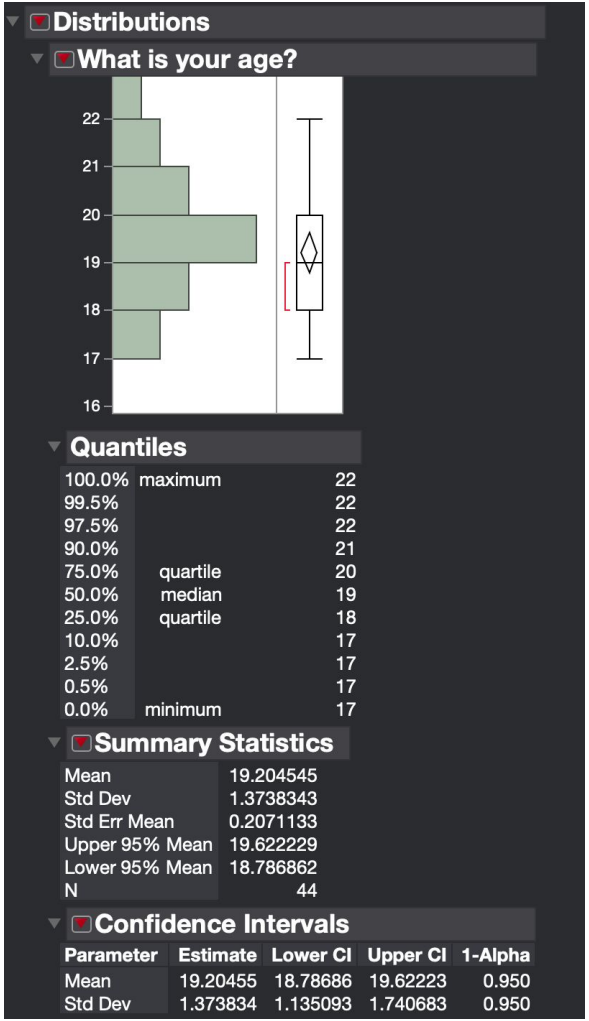
For a sample to be truly random, every subject has to have an equal chance of being selected. Our survey was handed out to the students and we got 43 responses. Since our pool of responses was low, we were able to pick all of them for our data analysis. Another important aspect of a random sample is that every member of the population has equal opportunity to respond to it. The survey was sent to all the students via email so all of them got an equal opportunity. For certain responses like Majors and region of origin we had a lot of varied answers, so we narrowed the responses down to simplified categories. Our dataset had a considerable amount of diversity, which is reflected in our analysis. Hence, we have a random sample here.

Summary Statistics

Quantitative variable: Age

Our sample size is > 30, so we can assume the distribution of the sample mean.

For the Age parameter, we are 95% confidence that the population proportion mean of the values lies between 18.79 and 19.63



Distributions

What country are you from?

Frequencies

Level	Count	Prob
Bahrain	1	0.02273
Canada	1	0.02273
China	6	0.13636
India	1	0.02273
Russia	1	0.02273
United Arab Emirates	1	0.02273
United States	33	0.75000
Total	44	1.00000

N Missing 0

7 Levels

Confidence Intervals

Level	Count	Prob	Lower CI	Upper CI	1-Alpha
Bahrain	1	0.02273	0.004023	0.118077	0.950
Canada	1	0.02273	0.004023	0.118077	0.950
China	6	0.13636	0.06403	0.267095	0.950
India	1	0.02273	0.004023	0.118077	0.950
Russia	1	0.02273	0.004023	0.118077	0.950
United Arab Emirates	1	0.02273	0.004023	0.118077	0.950
United States	33	0.75000	0.605594	0.854258	0.950
Total	44				

Note: Computed using score confidence intervals.

Summary Statistics

Qualitative variable: Country

We could only find the confidence interval for United States as we did not have sufficient data on other countries as their sample size was small ($np \geq 15$ and $nq \geq 15$)

For the region parameter, we are 95% confidence that the population proportion mean of region lies between 0.0606 and 0.854

Significance level for both: 5 percent

Conclusion:

- For the Age parameter, we are 95% confidence that the population proportion mean of the values lies between 18.79 and 19.63
- For the region parameter, we are 95% confidence that the population proportion
mean of region lies between 0.0606 and 0.854

Note: We could only find the confidence interval for United States as we did not have
sufficient data on other countries as their sample size was small ($np \geq 15$ and $nq \geq 15$

Conclusion

- According to our findings, there not much correlation between the time spent on listening to music and GPA as students score approximately the same GPAs without high disparities.
- We can observe that there is a correlation between music genre and major, as different majors prefer different genre of music.
- We can also observe that the most common activity associated with music is leisure.
    - For the Age parameter, we are 95% confidence that the population proportion mean of the values lies between 18.79 and 19.63
    - - For the region parameter, we are 95% confidence that the population proportion mean of region lies between 0.0606 and 0.854
    - For the age group of 17 years, the overall most popular music genres were pop music and rock
    - In the analysis of the data for age distribution, we found one outlier - age of 22 years old. Only two people were of this age, so we disregarded it in our final analysis.
    - We can observe that pop music is popular in both categories, and for non-US, mainly Asian in our data, hip-hop and country music are in higher preference than for people from the USA.