OMS CS6750 - Assignment M2

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Abstract—My project is going to focus on redesigning the search function for Spotify users in order to accomplish the task of finding content they want to listen to. For the few people that are not that familiar with Spotify, it is one of the most popular music and podcast streaming services available. One might assume that the search function in Spotify is just to browse for specific music, but the search bar in Spotify is quite expansive in terms of functionality. Initially it shows you a page with your recent searches, charts, and various music genres. The search function also allows the user to look for specific artists, songs, albums, podcasts, playlists, profiles and more.

Needfinding Execution 1: Interviews

For my interviews I spoke to a handful of friends and family members to ask them about their experience with searching for music/podcasts/listening content in general. Table 1 has the most common interview responses to some key questions. The full text of my interview questions is in the appendix.

Table 1—Interview quotes of common responses

Interview Question	Interview quotes
When and where do you listen to content?	"Walking, using alexa or a smart speaker while cooking/cleaning, during workouts, podcasts on commute to work, music on for a social event"
How often do you know what kind of content you want to listen to?	"Frequently know exactly what kind of song/podcast to listen to, or at least know what genre or playlist to listen to. Very little time is spent searching for new content"
How do you usually discover new songs/podcasts?	Most common response was "through friend recommendations". "Playlists on Spotify" was the second most common.
How often do you feel like you are	"Very often listening to the same few

listening to the same songs or same kind of content? Does this affect how often you will listen?	songs, and it does result in listening to less music because I am bored with what I'm listening to"
How much time do you spend looking for new content?	"Only 1 to 3 minutes"
Why don't you spend more time looking for new content if you are bored?	"Because it takes too much effort to look for new things" "Spotify algorithm shows the same playlists/songs"
What else would you like to see within Spotify's search interface?	"Even though there is a friend activity part of Spotify I feel like I can't easily see what my friends are listening to. I often have to go to Instagram to look at what influencers and other artists are listening to."

Summary of interview results:

One interview question result that surprised me was "how often do you know what kind of content you want to listen to?". Four out of five interviewees responded with some version of they almost always know exactly what they want to listen to. This definitely makes me question my motivation for redesigning Spotify's search interface because the user may not need anything redesigned if that's the case. The other surprising result was question ten when I asked "what else would you like to see within Spotify's search interface?". I had three people tell me they want more out of the friend activity part of Spotify and they feel they need to leave the platform and go to Instagram or Twitter to find what they are looking for. This definitely gives me some ideas for what the user wants to accomplish within this interface.
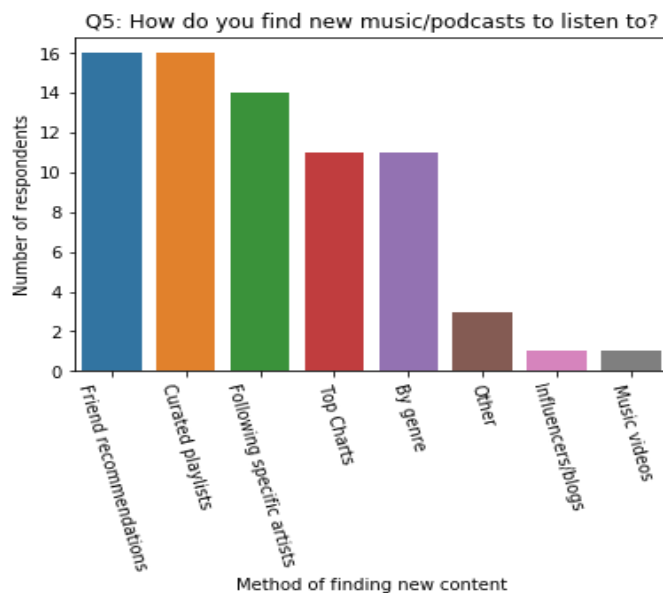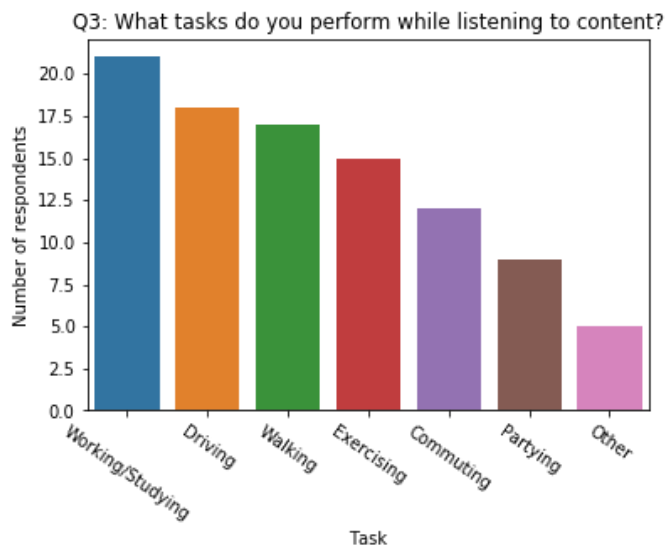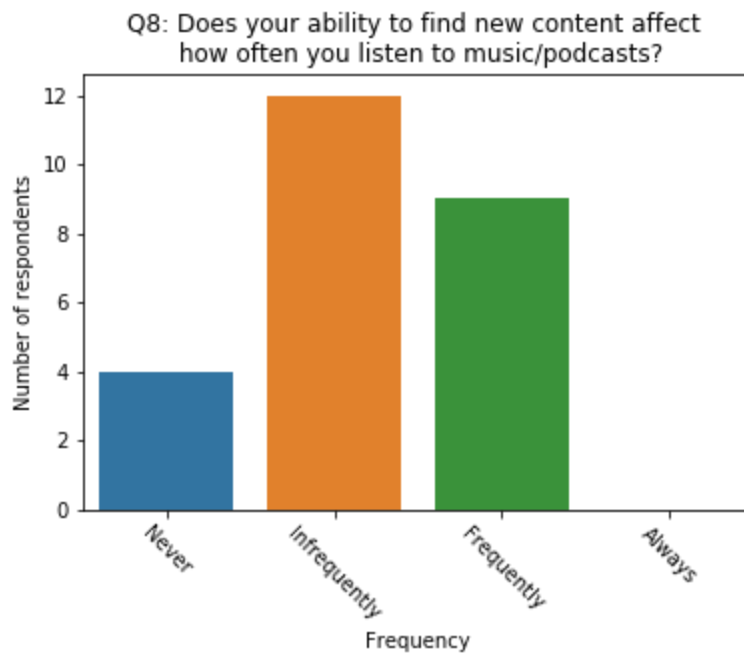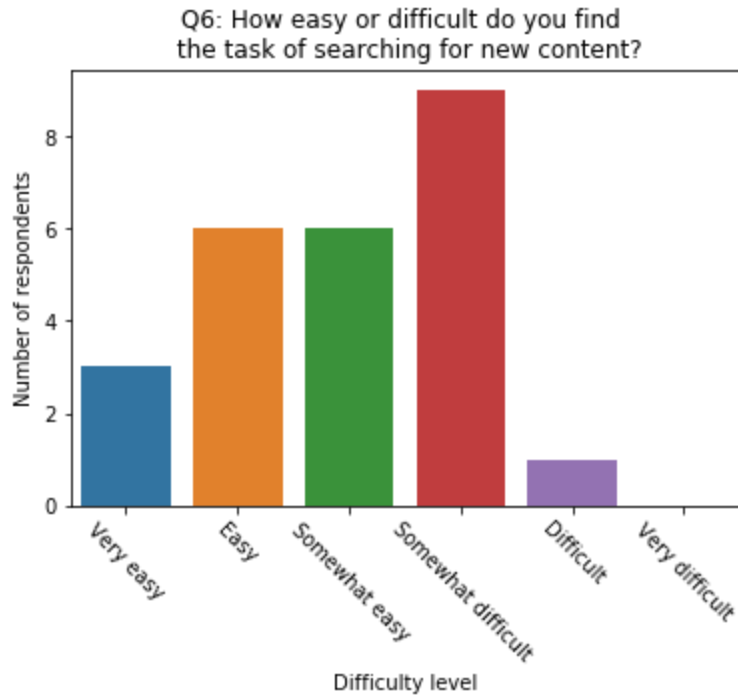
Steps to control biases:

The first step I took to control biases was iterating my interview questions by rewording several questions to try and remove any "leading questions". This was definitely difficult because sometimes I didn't realize a question was leading until I ran it by someone else. I think I may need to rewrite, "How often do you feel like you are listening to the same songs or same kind of content? Does this affect how often you will listen?" because it is still somewhat leading. The second

step I took was asking each participant to actually open their Spotify app and look at the search interface in real time to remove some recall bias.

Needfinding Execution 2: Surveys

My survey consisted of eleven questions and I distributed it to peersurvey.cc.gatech.edu and the ed forum of CS6750 in order to receive twenty five responses. The visualizations below show you some highlights of the survey results, and the full survey results can be viewed in the appendix of this paper.

Q3: What tasks do you perform while listening to content?

Q5: How do you find new music/podcasts to listen to?

**Q6: How easy or difficult do you find
the task of searching for new content?**

**Q8: Does your ability to find new content affect
how often you listen to music/podcasts?**

Summary of survey results:

My two biggest takeaways from my survey was that about 36% of respondents found it "somewhat difficult" to search for new content on Spotify and 64% of

respondents said they found new content through friend recommendations and curated playlists. This gives me a good idea of how my user accomplishes the task of finding new content. I also found it very interesting that 84% of respondents said they listened to content while working/studying. This gives me a good idea of common subtasks. The survey results mimicked the interview results in terms of how the most common way users find new content is through friend recommendations. This may be my best clue into how I should redesign Spotify's search function so users don't need to leave the platform.

Steps to control biases:

I did my best to remove observer bias by iterating my survey questions several times. I believe I did a good job of not writing any leading questions. The other bias that I don't think I can control is recall bias because people are answering questions about a task they have done in the past. I would like to do some further needfinding of interacting with a user as they interact with Spotify in real time to try and remove this recall bias.

Needfinding Execution 3: Evaluation of Spotify's search existing UI

In order to evaluate Spotify's current search interface I asked a few of the same people I interviewed to participate in an empirical evaluation. I measured the following quantitative statistics to evaluate the current interface.

Table 2—Results of empirical evaluation of Spotify Search UI

Statistic	Result
Average time it takes the user to find a specific song they are looking for	10 seconds
Average time it takes the user to find a specific playlist they are looking for	12 seconds
Average time it takes the user to find a specific podcast they are looking for	7 seconds
Average number of errors	0

Summary of existing UI results:

Based on the systematic evaluation I performed with a few of my friends it appears that Spotify's existing user interface is quite easy and efficient to use. The average time it took any user to accomplish a task was well under thirty seconds and I didn't record any obvious errors in trying to accomplish the task of searching for a song, playlist, or podcast they wanted to listen to.

Steps to control biases:

By having a systematic approach of actually measuring particular tasks and errors I believe I avoided most of the potential biases associated with evaluating an interface such as Spotify's search function. One type of bias I couldn't account for was voluntary response bias because the three people that participated in this were relatively expert users of Spotify. Perhaps if I had time to find a few novice users of Spotify they wouldn't have accomplished their task in such a short period of time.

Data Inventory

Who are the users? My survey had three questions that helped answer this question broadly. 56% of my respondents were between ages 25-34, 80% were white and 28% listen to 12+ hours of content per week. As I mentioned earlier I want my potential redesign to be for anyone that uses Spotify regardless of demographics or user expertise. The "who" I'm most interested in are users that want a way of finding new interesting content to listen to that can't easily accomplish this task currently. 36% of survey respondents said they find it somewhat difficult to find new content. 64% said they find new content through friend recommendations or curated playlists.

Where are the users? This question is mostly answered through survey question number three, "what tasks do you perform while listening to music?". 84% of survey respondents said they listen to content while working/studying, 72% driving, 68% walking, 60% exercising, 48% commuting, and 36% partying. It is also interesting to note that 64% of my survey respondents are living in the Northeast or Midwest of the US which tells you they are in a colder weather environment.

What is the context of the task? If the user knows exactly what they want to listen to Spotify's search interface is pretty amazing and they can find a specific song or podcast in under a minute (48% of survey respondents said they spend

0-2 minutes searching for content), but if the user doesn't know what they want to listen to (36% of survey respondents said they infrequently know what content they want to listen to) it can be a difficult task that may require the user to leave Spotify and go to Google or ask friends for recommendations.

What are their goals? The user's goal is to find music/podcasts to listen to while performing another task such as working/studying. 64% of my survey respondents said they "usually" or "always" know what they want to listen to, and in this case the goal is easily accomplished. The other 36% of survey respondents said they "infrequently" know what they want to listen to and then the goal is to have an easy way to find new content through other means.

What do they need? This question is mostly answered by my fifth survey question, "how do you find new content?". Curated playlists, following specific artists, top charts, and searching by genres are all easy ways to find new content on Spotify's current search interface. The 64% of respondents that said they need friend recommendations, and a few respondents said they use influencers/blogs, music videos, and other means may need more than what Spotify's current interface offers.

What are their tasks? The user's task is to find music/podcasts to listen to. This question is also mostly answered by my fifth survey question, "how do you find new content?". The user is usually accomplishing this task within Spotify's search interface except when it comes to friend recommendations, curated playlists that are not on Spotify's platform, influencers/blogs, and music videos. From my interviews I found most users use Instagram for influencers and friend recommendations, and Youtube for music videos.

What are their subtasks? The user's subtasks are answered by my third interview and survey questions that asked "what tasks do you perform while listening to music?" 84% of survey respondents said they listen to content while working/studying, 72% driving, 68% walking, 60% exercising, 48% commuting, and 36% partying. I did have 20% of survey respondents answer "other" for this question and that makes me think I need to allow survey respondents to write in what that "other" subtask is. I'm also afraid this question is heavily exposed to recall bias.

Defining Requirements

The recurring theme of this paper mostly focuses on the functionality Spotify's search interface must provide the user that it currently does not. I think friend recommendations are not currently possible without leaving the platform of Spotify. The only way to share with friends is copying and pasting a song link or posting something to social media, but you can't accomplish this functionality within the Spotify app. The learnability goal of the interface is for any user, novice or expert, to be able to search for the content they want easily. I think this goal is mostly accomplished already by Spotify. In terms of metrics, I would like to have the percentage of users that find what content they are looking for without ever leaving the Spotify app. I would also like to measure the amount of time it takes the user to accomplish this task.

Continued Needfinding

On my next iteration of needfinding I would focus on putting out a new survey, and executing a couple of new needfinding methods such as think-aloud protocols. For the new survey I would want the respondents to have the ability to write in their "other" response because I had 20% of the users respond "other" to my question of "what tasks do you perform while listening to content?". I would also want to ask a few new questions that address the data inventory questions more directly. I would focus on a think-aloud protocol because I believe I wasn't able to eliminate recall bias with my three needfinding plans. I think it can be very difficult for the user to remember an event from the past like they actually know exactly what kind of content they wanted to listen to and can they recall how long it really took them to find that content. I don't believe it is easy for anyone to recall those types of details so I'd like a needfinding plan that addresses that huge bias.
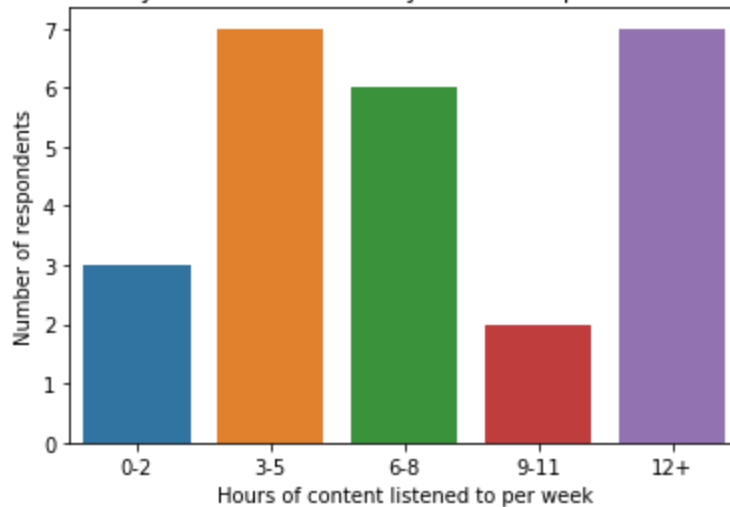
REFERENCES

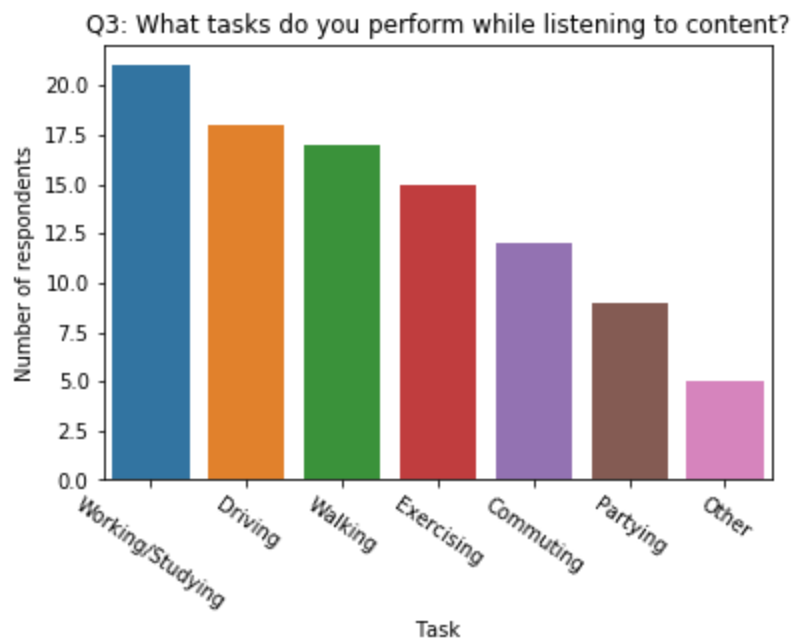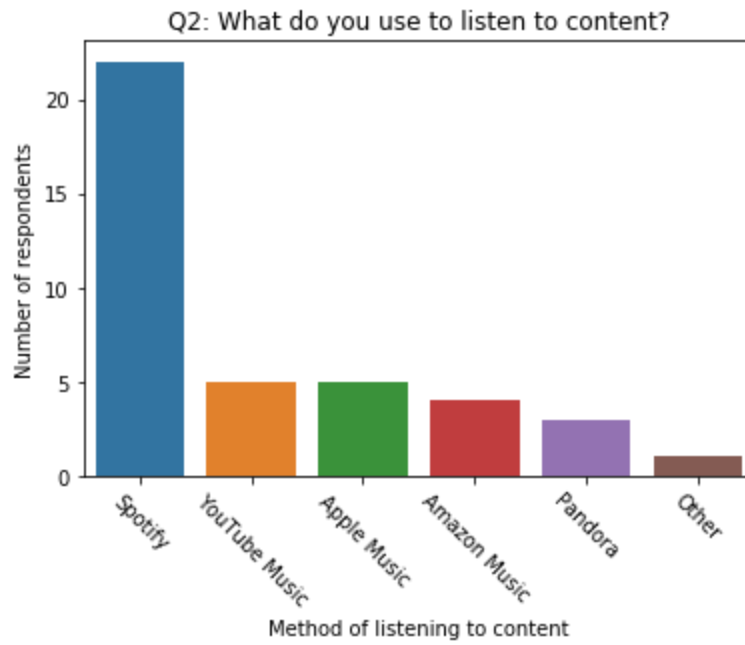1. CS6750's Video Lessons

APPENDICES

1. **Full Interview results**

Interview Question	Interview quotes
How often do you listen to music/podcasts per week in hours?	One to two hours per day on average
What do you use to listen to music/podcasts?	"Some kind of smartphone, Spotify, Apple Music, or Youtube"
When and where do you listen to content?	"Walking, using alexa or a smart speaker while cooking/cleaning, during workouts, podcasts on commute to work, music on for a social event"
How often do you know what kind of content you want to listen to?	"Frequently know exactly what kind of song/podcast to listen to, or at least know what genre or playlist to listen to. Very little time is spent searching for new content"
How do you usually discover new songs/podcasts?	Most common response was "through friend recommendations". "Playlists on Spotify" was the second most common response.
How often do you feel like you are listening to the same songs or same kind of content? Does this affect how often you will listen?	"Very often listening to the same few songs, and it does result in listening to less music because I am bored with what I'm listening to"
How much time do you spend looking for new content?	"Only 1 to 3 minutes"
Why don't you spend more time looking for new content if you are bored?	"Because it takes too much effort to look for new things" "Spotify algorithm shows the same playlists/songs"
How do you feel about Spotify's search interface in general?	"I like that Spotify shows you more than just genres. For example, it

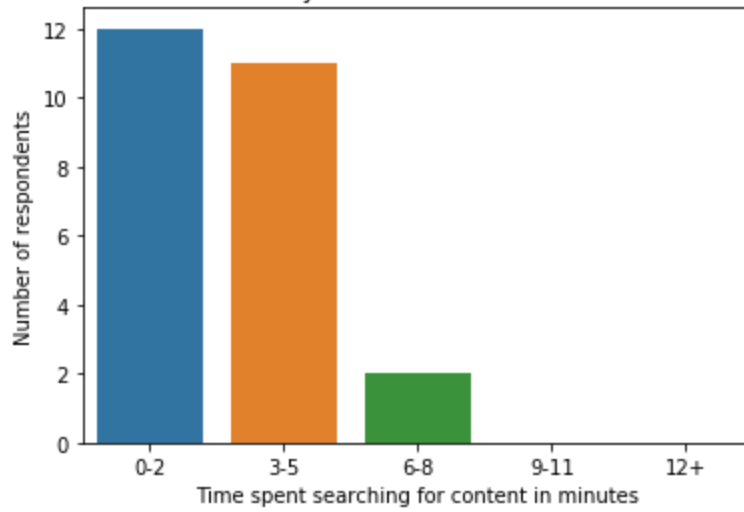|	shows you moods and charts, etc." "I do feel a bit frustrated by Spotify's curated playlists because there is too much overlap in content". "I wish I knew what more of my friends were listening to as a way of finding more songs."
What else would you like to see within Spotify's search interface?	"Even though there is a friend activity part of Spotify I feel like I can't easily see what my friends are listening to. I often have to go to Instagram to look at what influencers and other artists are listening to."

2. Full Survey results

Q1: How many hours of content do you listen to per week on average?

Q2: What do you use to listen to content?

Number of respondents

Method	
Spotify	22
YouTube Music	5
Apple Music	5
Amazon Music	4
Pandora	3
Other	1

Method of listening to content

Q3: What tasks do you perform while listening to content?

Number of respondents

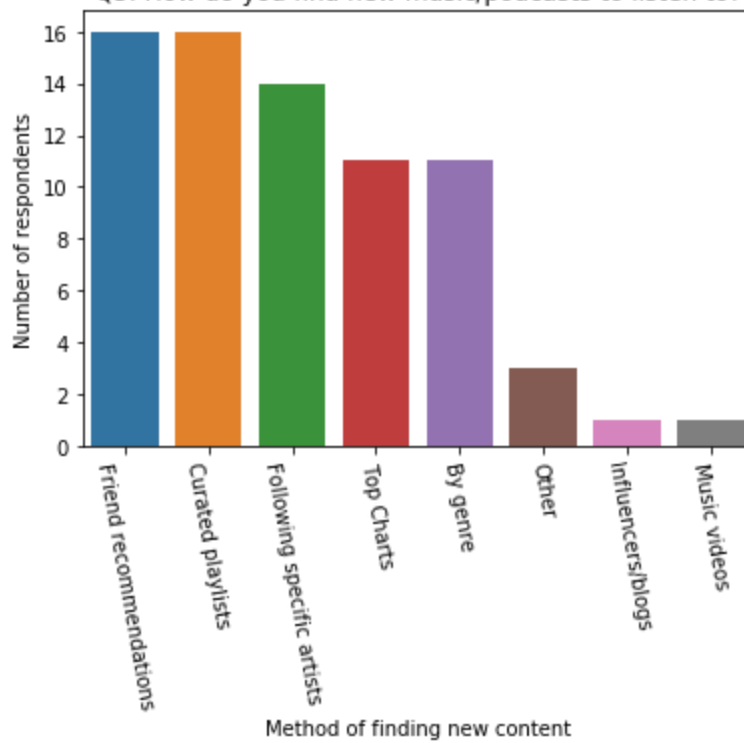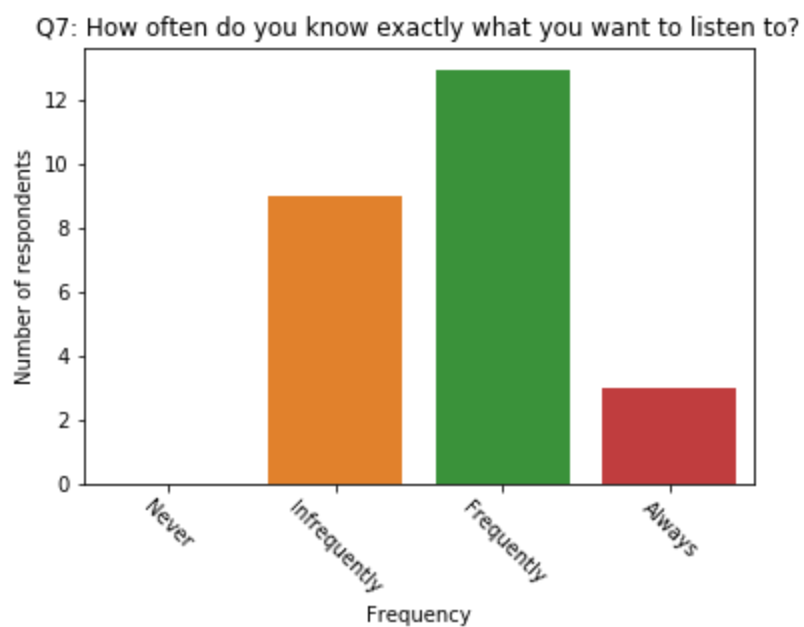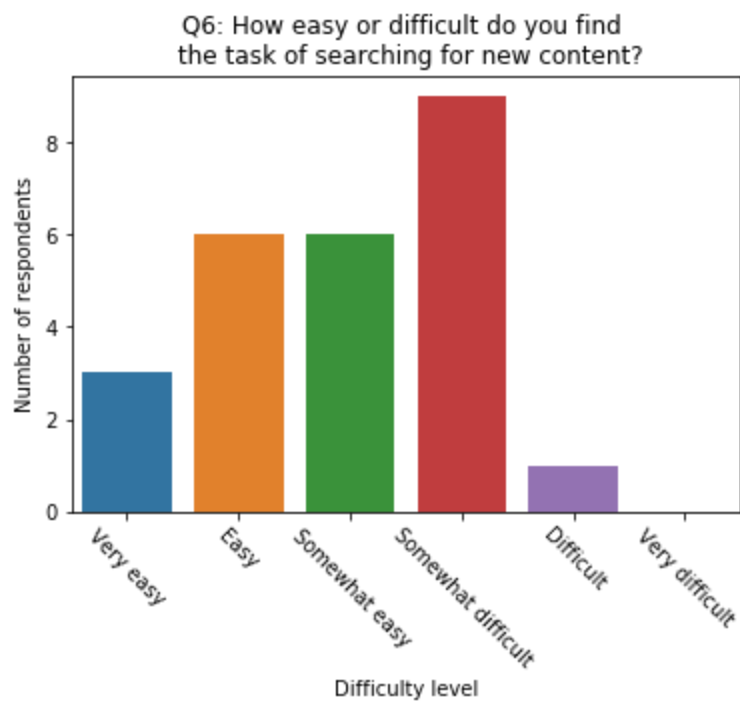| Task | |
Working/Studying	21
Driving	18
Walking	17
Exercising	15
Commuting	12
Partying	9
Other	5

Task

Q4: How much time do you spend searching
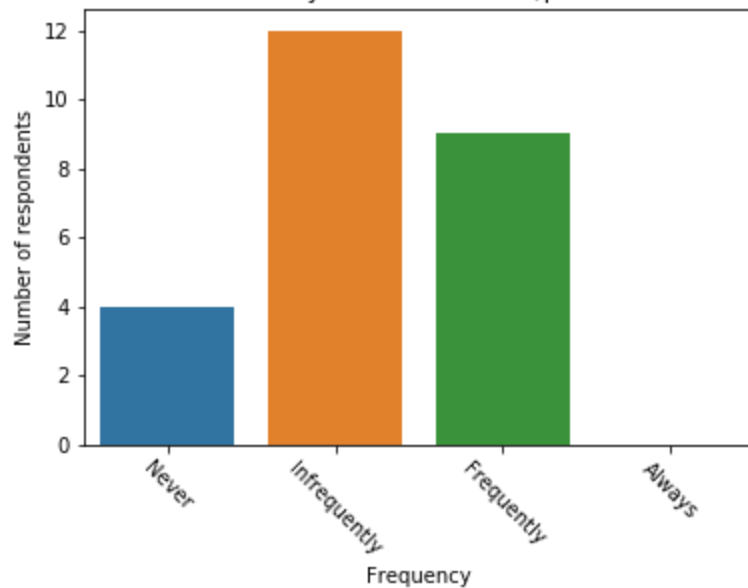for the content you want to listen to? (in minutes)?

Q5: How do you find new music/podcasts to listen to?

Q6: How easy or difficult do you find the task of searching for new content?

Q7: How often do you know exactly what you want to listen to?

Q8: Does your ability to find new content affect how often you listen to music/podcasts?

Q9: How old are you?

Q10: Where do you live?

Q11: What is your ethnicity?