**Assignment 6 – Milestones, Timeline and Effort Matrix**

**Milestones**

***Milestone 1: Complete Preliminary Research***

This is the first phase of the project wherein research will be done on all different components of the project. The first focus area for research will be the components related to the music recommendation algorithm. This involves an in-depth analysis of Spotify’s MUSIG algorithm, it’s strengths as well as its shortcomings. Research will also be conducted to consider different measures of similarity and which method of determining similarity works best for this project. The second focus area for research will be the android application. In particular, research will be conducted to determine the most efficient framework to utilize for this kind of application, as well as whether there exists a template for the user interface that can be utilized. Reaching this milestone means that the following questions are answered in detail:

* What are the strengths and weaknesses of Spotify’s music recommendation algorithm?
* Are there any other existing music recommendation algorithms that can be analyzed for this project? What are the strengths and weaknesses of those?
* What musical features are most important in determining similarity? Which of these features will be offered as adjustable parameters to the user?
* What methods (algorithms) for measuring similarity work best for this project? Can different methods be utilized for different parameters?
* What framework is most suitable for developing the Android application? How does it compare to others in terms of efficiency?
* Is there a specific template that can be utilized for the user interface?
* What APIs and tools will be used for this project?
* Are there any legal, financial, or other resource related limitations?

*Note: Some of the above questions will be answered in the assignments during the course of this project. Secondary research, which will answer all questions on a rolling basis as they arise during the latter phases of the project, will be conducted throughout the course of the project.*

***Milestone 2: Complete Prototyping and Designing***

This is the second milestone of the project which involves developing a prototype. This includes creating wireframes, determining various data flow paths, determining the color schema and visual elements of the android application, and testing various solutions for some of the more complex and confusing features of the recommendation algorithm. Reaching this milestone doesn’t necessarily mean that all deliverables are met but rather knowing what solutions would work best for each and how to implement them.

***Milestone 3: Complete Development***

This is the third milestone of the project which involves developing actual code. This is when most of the full-scale development for the application will take place. Reaching this milestone means that the following deliverables have been completed:

* Design the User Interface.
* Develop the registration/sign-up and sign-in features.
* Develop support for editing user profiles and settings.
* Develop the playlist generator feature.
* Develop support to enable the personalization of the recommendation algorithm.
* Develop support to modify the search.
* Develop a feature to export the playlists generated to Spotify.
* Develop a feature to manage and edit the playlist after it is generated.

*Note: These deliverables are intentionally more general in their wording to cover a variety of related tasks under each item on the list. For example, the deliverable “Develop the playlist generator feature” involves developing the entire music recommendation algorithm, the related frontend components, as well as backend components such as retrieving user preferences to pre-populate the search fields, retrieving songs online based on user-preferences, creating the playlist itself and returning it to the user, etc.*

***Milestone 4: Complete Testing and Verification***

This milestone involves developing test cases for various features of the application. Each of these test cases will test one or more features of the project for accuracy and efficiency. Passing a test case means that the outcome of the test matches the expected/desired results. Given how extensive this project is, the list of test cases need not be exhaustive. Tests cases for typical usage will be prioritized over edge cases or more obsolete usage. This phase may also involve user testing to identify issues and areas of improvement that may not have been recognized in the test cases. Reaching this milestone means that all test cases have been defined thoroughly, run on the system at least once and documented for future development and phases of the project.

***Milestone 5: Complete Refining and Debugging***

Based on the results of the testing and debugging phase, changes will be made to the code to refine the algorithm and debug any issues noted in the preceding phase of the project. Decisions will be made on which issues should be prioritized, if changes should be made to the expectations for the product, and if there are alternative solutions that can be implemented reasonably within the given time-constraints to refine the app further.

***Milestone 6: Complete Validation and Deployment***

This is the last milestone in this project. The test cases developed previously, will be run once again to validate the functionality of each feature, and ensure that the application works as desired. Reaching this milestone means documenting everything that was accomplished during the course of this project.

***Milestone 7: Develop Support For Additional Features***

This is an optional milestone that may or may not be reached depending on time-constraints. This involves developing additional features as listed under Desirables in the Task List:

* Develop a feature to export the playlist generated to other music apps such as Apple Music.
* Determine if this project can be extended to music in different languages and the implementation of such a feature if possible.
* Extend the registration feature to allow users to sign in using Google/Facebook.
* Determine if the project can be extended to other forms of entertainment - movies, TV series, podcasts, etc.
* Develop support for importing data from users' Spotify/Apple Music profiles.
* Develop support for playing music from within the application.

**Timeline**

**Table 1: Detailed Description of the timeline of tasks and anticipated milestones associated with this project.**

|  |  |  |  |
| --- | --- | --- | --- |
| Number | Task | Start Date | End Date |
| Task 1 | Curate a list of the top music recommendation algorithms that currently exist. | 15-Aug-22 | 15-Oct-22 |
| Task 2 | Research and analyze these algorithms for their performance and user satisfaction. | 16-Oct-22 | 29-Oct-22 |
| Task 3 | Determine what works best in each of the algorithms (and if) any ideas can be reutilized for this project. | 30-Oct-22 | 12-Nov-22 |
| Task 4 | Determine which parameters are most relevant for defining user preferences in music. | 13-Nov-22 | 26-Nov-22 |
| Milestone 1 | **Complete Preliminary Research** | **26-Nov-22** | |
| Task 5 | For each parameter shortlisted, find the best way to measure similarity. | 27-Nov-22 | 10-Dec-22 |
| Task 6 | Determine the weightage for each parameter's similarity measure and how to calculate the cumulative similarity. | 11-Dec-22 | 16-Dec-22 |
| Task 7 | Determine what framework will be most suitable for developing the android application component. | 16-Dec-22 | 17-Dec-22 |
| Task 8 | Design the logo and determine the color scheme for the application. | 17-Dec-22 | 19-Dec-22 |
| Milestone 2 | **Complete Prototyping and Designing** | **19-Dec-22** | |
| Task 9 | Design the User Interface. | 4-Jan-23 | 14-Jan-23 |
| Task 10 | Develop the registration/sign-up and sign-in features. | 15-Jan-23 | 18-Jan-23 |
| Task 11 | Develop support for editing user profiles and settings. | 19-Jan-23 | 21-Jan-23 |
| Task 12 | Develop the playlist generator feature. | 22-Jan-23 | 30-Jan-23 |
| Task 13 | Develop support to enable the personalization of the recommendation algorithm. | 31-Jan-23 | 4-Feb-23 |
| Task 14 | Develop support to modify the search. | 5-Feb-23 | 8-Feb-23 |
| Task 15 | Develop a feature to export the playlists generated to Spotify. | 9-Feb-23 | 11-Feb-23 |
| Task 16 | Develop a feature to manage and edit the playlist after it is generated. | 12-Feb-23 | 14-Feb-23 |
| Milestone 3 | **Complete Development** | **14-Feb-23** | |
| Task 17 | Develop test cases to test the different components of the application. | 15-Feb-23 | 21-Feb-23 |
| Task 18 | Run test cases and document all results. | 22-Feb-23 | 26-Feb-23 |
| Milestone 4 | **Complete Testing and Verification** | **26-Feb-23** | |
| Task 19 | Refine the algorithm based on the results of these tests and fix any glitches, bugs or issues in the Android application. | 27-Feb-23 | 11-Mar-23 |
| Milestone 5 | **Complete Refining and Debugging** | **11-Mar-23** | |
| Task 20 | Validate all components by rerunning the same test cases. | 12-Mar-23 | 26-Mar-23 |
| Milestone 6 | **Complete Validation and Deployment** | **26-Mar-23** | |
| Task 21 | Develop a feature to export the playlist generated to other music apps such as Apple Music. | 27-Mar-23 | 30-Mar-23 |
| Task 22 | Determine if this project can be extended to music in different languages and the implementation of such a feature if possible. | 31-Mar-23 | 2-Apr-23 |
| Task 23 | Extend the registration feature to allow users to sign in using Google/Facebook. | 3-Apr-23 | 7-Apr-23 |
| Task 24 | Determine if the project can be extended to other forms of entertainment - movies, TV series, podcasts, etc. | 8-Apr-23 | 12-Apr-23 |
| Task 25 | Develop support for importing data from users' Spotify/Apple Music profiles. | 13-Apr-23 | 15-Apr-23 |
| Task 26 | Develop support for playing music from within the application. | 16-Apr-23 | 20-Apr-23 |
| Milestone 7 | **Develop Support For Additional Features** | **20-Apr-23** | |
| Task 27 | Document all relevant information throughout the course of this project. | 15-Aug-22 | 15-Apr-23 |

**Chart 1: Visual representation of the timeline of different phases within this project**

**Table 2: Effort Matrix**

|  |  |  |  |
| --- | --- | --- | --- |
| Number | Task | Days to complete | Hours of Effort |
| Task 1 | Curate a list of the top music recommendation algorithms that currently exist. | 61 | 8 |
| Task 2 | Research and analyze these algorithms for their performance and user satisfaction. | 13 | 12 |
| Task 3 | Determine what works best in each of the algorithms (and if) any ideas can be reutilized for this project. | 13 | 12 |
| Task 4 | Determine which parameters are most relevant for defining user preferences in music. | 13 | 12 |
| Milestone 1 | **Complete Preliminary Research** | | |
| Task 5 | For each parameter shortlisted, find the best way to measure similarity. | 13 | 12 |
| Task 6 | Determine the weightage for each parameter's similarity measure and how to calculate the cumulative similarity. | 5 | 8 |
| Task 7 | Determine what framework will be most suitable for developing the android application component. | 1 | 2 |
| Task 8 | Design the logo and determine the color scheme for the application. | 2 | 3 |
| Milestone 2 | **Complete Prototyping and Designing** | | |
| Task 9 | Design the User Interface. | 10 | 12 |
| Task 10 | Develop the registration/sign-up and sign-in features. | 3 | 6 |
| Task 11 | Develop support for editing user profiles and settings. | 2 | 4 |
| Task 12 | Develop the playlist generator feature. | 8 | 20 |
| Task 13 | Develop support to enable the personalization of the recommendation algorithm. | 4 | 8 |
| Task 14 | Develop support to modify the search. | 3 | 4 |
| Task 15 | Develop a feature to export the playlists generated to Spotify. | 2 | 4 |
| Task 16 | Develop a feature to manage and edit the playlist after it is generated. | 2 | 4 |
| Milestone 3 | **Complete Development** | | |
| Task 17 | Develop test cases to test the different components of the application. | 6 | 15 |
| Task 18 | Run test cases and document all results. | 4 | 8 |
| Milestone 4 | **Complete Testing and Verification** | | |
| Task 19 | Refine the algorithm based on the results of these tests and fix any glitches, bugs or issues in the Android application. | 12 | 24 |
| Milestone 5 | **Complete Refining and Debugging** | | |
| Task 20 | Validate all components by rerunning the same test cases. | 14 | 20 |
| Milestone 6 | **Complete Validation and Deployment** | | |
| Task 21 | Develop a feature to export the playlist generated to other music apps such as Apple Music. | 3 | 6 |
| Task 22 | Determine if this project can be extended to music in different languages and the implementation of such a feature if possible. | 2 | 4 |
| Task 23 | Extend the registration feature to allow users to sign in using Google/Facebook. | 4 | 8 |
| Task 24 | Determine if the project can be extended to other forms of entertainment - movies, TV series, podcasts, etc. | 4 | 8 |
| Task 25 | Develop support for importing data from users' Spotify/Apple Music profiles. | 2 | 4 |
| Task 26 | Develop support for playing music from within the application. | 4 | 8 |
| Milestone 7 | **Develop Support For Additional Features** | | |
| Task 27 | Document all relevant information throughout the course of this project. | 248 | 20 |
|  | **Total** | 248 | 281 |

*Note: Since I am the only member in my team, all of these tasks are assigned to me.*