Introduction

1.1 Purpose The purpose of this document is to provide a comprehensive software requirements specification for the Duolingo language learning application. This document will serve as a reference for the development team and stakeholders involved in the project to ensure that the final product meets the requirements and expectations of all parties involved.

1.2 Document Conventions This document follows the IEEE Std 830-1998 standard for software requirements specifications. It includes the following sections: Introduction, Overall Description, System Features, External Interface Requirements, Nonfunctional Requirements, and Other Requirements. Each section provides specific information about the application's functionalities, requirements, and constraints.

1.3 Intended Audience and Reading Suggestions This document is intended for the development team, project managers, and stakeholders involved in the Duolingo application development. The primary audience of this document is the development team responsible for the design, development, and testing of the application. Other stakeholders, such as investors, marketing team, and end-users, may also find this document useful to understand the application's functionalities and requirements.

To fully understand the application's requirements, it is suggested to read the document in its entirety. However, stakeholders who are only interested in specific sections may refer to the table of contents to navigate the document.

1.4 Project Scope The project scope includes the design and development of the Duolingo language learning application for iOS and Android platforms. The application will provide language learning courses for various languages, including English, Spanish, French, German, and many more. The application will include features such as gamification, social learning, in-app purchases, and offline learning.

1.5 References This document references the following documents:

* IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications
* Duolingo website: <https://www.duolingo.com/>
* Duolingo mobile application: iOS and Android versions

Overall Description

2.1. Product Perspective The Duolingo app is an interactive language-learning platform that can be accessed via a web browser or mobile application. It is designed to be user-friendly and provide a seamless experience to users regardless of their language proficiency level. The product is developed by Duolingo Inc. and is aimed at language learners of all ages and backgrounds.

2.2. Product Features The Duolingo app is equipped with a wide range of features that cater to the needs of language learners. The key features of the app include:

* A variety of language courses covering over 30 languages
* A personalized learning experience based on the user's proficiency level
* Interactive lessons that include reading, writing, speaking, and listening exercises
* Gamification elements such as points, streaks, and leaderboards to motivate users
* Social features that allow users to connect with friends and compete with them in language learning challenges
* Adaptive algorithms that adjust the difficulty level of lessons based on user performance
* Offline access to courses and lessons for premium users
* In-app purchases to unlock additional features and content

2.3. User Classes and Characteristics The Duolingo app is designed for users of all ages and backgrounds who are interested in learning a new language or improving their language proficiency. The user classes can be broadly categorized as follows:

* Novice users: Users who have little to no prior knowledge of the language they are learning
* Intermediate users: Users who have some prior knowledge of the language but need to improve their proficiency
* Advanced users: Users who are proficient in the language but want to further refine their skills

2.4. Operating Environment The Duolingo app can be accessed via a web browser or mobile application and is compatible with a wide range of devices and operating systems. The app requires an internet connection to access lessons and courses, although some features are available offline for premium users. The app can be used on devices running iOS, Android, and Windows operating systems.

2.5. Design and Implementation Constraints The Duolingo app is designed to be user-friendly and accessible to users of all proficiency levels. The app uses a combination of audio, visuals, and gamification elements to create an engaging and interactive learning experience. The app also employs adaptive algorithms to adjust the difficulty level of lessons based on user performance.

The implementation of the Duolingo app is subject to the following constraints:

* The app must be compatible with a wide range of devices and operating systems
* The app must provide a seamless and consistent user experience across all devices and platforms
* The app must be scalable to accommodate a growing user base
* The app must be secure and protect user data and privacy

2.6. User Documentation The Duolingo app provides user documentation in the form of a help center, user guides, and a community forum. The help center provides answers to frequently asked questions, while the user guides provide step-by-step instructions on how to use the app. The community forum allows users to connect with other language learners, ask questions, and share tips and strategies.

2.7. Assumptions and Dependencies The Duolingo app is developed with the following assumptions and dependencies in mind:

* Users have access to an internet connection to access courses and lessons
* Users have basic computer and mobile device literacy skills
* Users are willing to invest time and effort in learning a new language
* The app is dependent on third-party software and services, such as hosting and cloud storage providers.

System Features

3.1 System Feature 1

This feature of the Duolingo app is the ability to create and manage user accounts. Users can sign up for an account, login and logout of their account, and edit their profile information. The system should also be able to handle password reset requests.

3.2 System Feature 2

The Duolingo app provides a wide range of language courses and learning materials for different levels of learners. Users can select their preferred language courses and access the lessons, exercises, and tests associated with the course. The system should also track user progress and provide recommendations for further learning based on the user's performance.

3.3 System Feature 3

This feature of the Duolingo app is the ability to provide a personalized learning experience to users. The system should be able to adapt to the user's learning style, pace, and preferences to provide a customized learning experience. The app should also provide real-time feedback to the user to help them improve their language skills.

3.4 System Feature 4

The Duolingo app provides a social learning platform that allows users to connect with other learners and native speakers. Users can engage in discussions, share language tips, and participate in language exchange programs. The system should also provide a safe and secure environment for users to interact with each other.

3.5 System Feature 5

The Duolingo app provides a gamified learning experience that motivates users to continue learning. Users can earn rewards, badges, and streaks for completing lessons, exercises, and tests. The system should also provide a leaderboard to encourage friendly competition among users.

3.6 System Feature 6

The Duolingo app provides offline access to language lessons, exercises, and tests. Users can download the learning materials to their device and access them even when they are not connected to the internet. The system should also synchronize user progress when the user reconnects to the internet.

3.7 System Feature 7

The Duolingo app provides support for multiple platforms, including mobile devices and web browsers. Users can access the app from their smartphones, tablets, and computers. The system should also provide a seamless experience across different platforms.

3.8 System Feature 8

The Duolingo app provides support for multiple languages, including English, Spanish, French, German, and many others. The system should also provide support for different language scripts, such as Latin, Cyrillic, Arabic, and Chinese.

3.9 System Feature 9

The Duolingo app provides an easy-to-use interface that is intuitive and user-friendly. The system should provide clear and concise instructions, error messages, and feedback to guide the user through the learning process.

3.10 System Feature 10

The Duolingo app provides a reliable and scalable infrastructure that can handle large volumes of users and traffic. The system should also provide high availability, fault tolerance, and disaster recovery capabilities to ensure that the app is always accessible to users.

External Interface Requirements

4.1 User Interfaces The Duolingo app should have an intuitive and easy-to-use interface that provides a seamless user experience. The app must be designed to be user-friendly and accessible for users of all ages, languages, and backgrounds. The app should have a clear and concise interface with intuitive navigation, easy-to-read text, and appropriate colors, graphics, and sound effects.

4.2 Hardware Interfaces The Duolingo app should be compatible with a variety of hardware devices, including smartphones, tablets, and laptops. The app should be optimized for different screen sizes and resolutions, and should make use of the various input mechanisms available on different devices, such as touchscreens, keyboards, and microphones.

4.3 Software Interfaces The Duolingo app should be designed to integrate with other software systems, such as social media platforms and other language learning apps. The app should also be able to communicate with other devices, such as smartwatches and fitness trackers, to track the user's progress and provide personalized recommendations.

4.4 Communications Interfaces The Duolingo app should be able to communicate with external servers to provide online features, such as cloud-based storage, synchronization across multiple devices, and social networking. The app should also be able to communicate with external APIs to provide additional functionality, such as speech recognition and translation services.

Other Non-functional Requirements

5.1 Performance Requirements The Duolingo app should be designed to be highly performant and responsive, with fast loading times and minimal latency. The app should be able to handle a large number of users and should be optimized for low-bandwidth and high-latency networks.

5.2 Safety Requirements The Duolingo app should be designed with safety in mind, with appropriate safeguards to protect user data and prevent unauthorized access. The app should be designed to comply with relevant data privacy and security regulations, such as GDPR and CCPA.

5.3 Security Requirements The Duolingo app should be designed to be highly secure, with appropriate measures in place to protect user data from unauthorized access, theft, and other security breaches. The app should use industry-standard encryption protocols to protect user data both in transit and at rest. The app should also implement appropriate user authentication and access control mechanisms to prevent unauthorized access to user data and features.

5.4 Software Quality Attributes The Duolingo app should be designed to be highly reliable and maintainable, with high-quality code that is easy to read, debug, and modify. The app should be designed to be highly scalable and extensible, with the ability to add new features and functionality as needed. The app should also be designed to be highly available and fault-tolerant, with appropriate measures in place to ensure minimal downtime and rapid recovery in the event of a failure or outage.