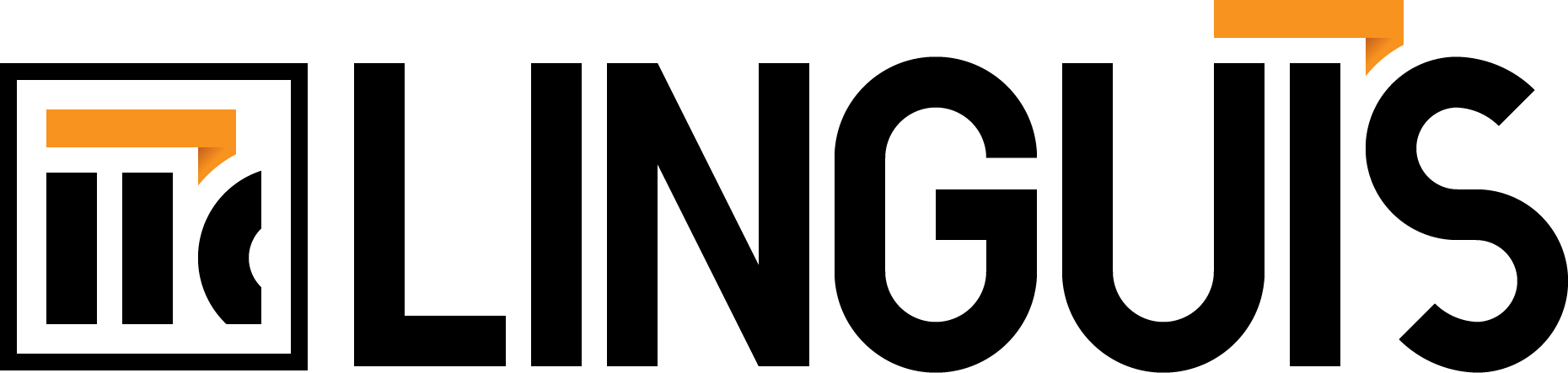
**Software Engineering Principle 13016214**

Project Report



Phonology Teaching Application.

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**Introduction**

**I. Linguīs Project Description**

Linguīs, meaning ‘into languages’ in Latin, is a phonetic learning software which aims to provide learners of languages and linguistics the resources and tools to make their phonology learning process more effective and convenient. It also aims to serve as a resource hub for easy access of language and linguistics knowledge. The app will achieve said goals by offering features such as the International Phonetic Alphabet chart completed with pronunciations, as well as access to various phonology topics. The users will be able to mark their most used topics, *as well as IPA characters*, for quick access. *The user will also be able to share their favourites list.*

The application will be written in Python 3 and will utilise PyQt5 to render its Graphical User Interface. This is to illustrate the powerful capabilities of the Python programming language, as well as the flexibility of the Qt GUI framework.

The application will be split into three primary sections as followed:

**International Phonetic Alphabet**

The IPA Chart section will consist of two parts. The first part would be an overview containing information about International Phonetic Alphabet and its usefulness. The latter part is a complete interactive chart of all the International Phonetic Alphabet glyphs, which users can interact with to view in detail the description of each character, as well as its pronunciation. *The users will also be able to save the character to their favourites list for easy access.*

**Phonology Information Hub**

The Information Hub section will consist of a database of information on phonology topics. Each topic in the information hub will also be able to be favourited for easy access. Users can expand the information by installing additional databases or revisions into the application.

Other in-section features in Linguīs are:

**Quizzes**

Each section contains a quiz that relates to the corresponding material to test and check the learning progress of the user.

**Favourites**

The Favourites section is will contain all the glyphs and information topics that the user has marked to allow the user to access them easily. The favourites will be organised systematically according to their type. The user will also be able to attach their own notes to the snippets to aid in remembering or understanding.

**Requirement (UF, UNF, SF, SNF)**

**User, functional requirements:**

1. Linguīs provides user to listen to each IPA symbols’ pronunciation at initial, medial and final position (consonants) and independent position (vowels).
2. Linguīs provides arrays of information about various topics about phonology.
3. Users are able to train their phonology knowledge by providing a quiz section.
4. Users are able to save their favourite topics and IPA symbols into Favourites list.
5. The text-to-speech section is able to convert IPA text into an audio output.
6. Outputted audio from the text-to-speech section can be saved to user-specified location.
7. Users can update the application to the newest version by installing update through the options menu.
8. Users can report bug to the developer.
9. Users can preserve their login information (‘remember me’ section) in the login page.

**User, non-functional requirements:**

1. Linguīs notifies users through e-mail when an update is delivered.
2. The user interface will be easy to navigate, with information categorised into sections.
3. Information about the development of Linguīs as well as its Github page will be available within the application.
4. The modification feature must not allow users to modify the application in a way that will cause it to malfunction.
5. The user’s favourites list is stored locally.
6. Linguīs is provided in English.
7. There is a help menu that provides users a guide to operate the application and navigate between menus.
8. Favourited topics are saved in a separate favourite menu.
9. Quizzes’ are equipped with scores and evaluations to tell user their progress and recommended future study.

**System, functional requirements:**

1. The text-to-speech converts IPA symbols and match the sequence with its corresponding IPA pronunciation sound file, and play the sequence.
2. Update is installed by calling the updateApp(updateFile) function which will modify some specified application data which are updated.
3. The text-to-speech output file can be saved into the local storage as a .wav file.
4. The application can evaluate quiz results by accumulating weighted scores in various topics.

**System, non-functional requirement:**

1. The user interface of the software will be modelled or designed with PyQt5 Graphics User interface library.
2. The software requires the database called PickleDB in order to provide approximately 5 tables for different types of data collection. These different tables will be used to collect different types of data information based on variety usage. For example, database for registration system, linguistic study resources, etc.
3. The software maintenance and development will be controlled and implemented under GitHub software version control system.
4. All of IPA symbols and its corresponding IPA pronunciations’ audio file will be stored in local storage and mapped in a dictionary (stored as key and values) which reduce difficulties for visualization needed for implementation and software maintenance
5. The software user interface supports the minimum screen resolution of 1366 x 768 pixels which generally supports the majority of monitoring devices in worldwide.
6. The application is written in Object Oriented Concept, using Python 3.
7. In case of a system error, an exception handler will be triggered to notify user or/and close the application.
8. Linguīs involves the MVC (Model, View, Controller) concept in its software design.
9. User IDs cannot be duplicate in the same device, and passwords should comply with certain format: contains at least one lowercase letter, at least one capital letter, at least one numeral and at least one symbol, and the length should not less than 6 or more than 12 character.

**/Design (3 use case (basic, alt, exc)+ sequence, others: basic; UML (UI, system); State chart (3); Source code/**