

# Software Requirements

## Audible-Plot

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### Abstract

This document specifies the requirements of a python module the supports "plotting" simple data series as audible speech and tones, together with a visual plot of the same data, with particular attention to accessibility by visually-impaired and blind users.

## 1 Introduction

## 2 Project Goals

The purpose of this project goes beyond the creation of a python module to audibly "plot" data. The project should also:

- Provide the contributors with practice programming in the "Python" language, including using libraries for:
  - Text to Speech
  - Audio synthesis
- Provide experience in designing and implementing an accessible program and web site about that program.
- Provide experience using software design tools, including:
  - Git version control
  - Static web site tools
  - Code documentation
  - Software Testing
- Provide an public repository for a professional résumé.

## 3 Module Requirements

The software module must meet the following requirements:

- It must be suitable to the study of Algebra by blind and low-vision students for whom the traditional manual and automated "graphing" of linear and polynomial functions is not instructive. (This is the use-case that prompted this project.)

- It must be written primarily in the "Python" programming language, as that language is well suited to both learning and production of a professional product and is compatible with a range of platforms.
- It must be open-source with a copy-left license.
- It must be well and accessibly documented, so that others and blind users in particular may benefit from it.
- It must have a professional and high-quality appearance, to be usable as a résumé portfolio reference.
- It must be compatible with Linux/Unix platforms, including particularly MacOS and Raspberry Pi, the platforms used by the initial contributors.
- It must rely only on historically and currently well-maintained dependencies to avoid becoming unusable due to broken dependencies so as to remain useful to others longer.

Recommendations */2023-03-28 Tue/*:

- Current stable Python language: 3.11.2 at <https://python.org>
- Gnuplot 5.4.6 at <http://gnuplot.info>
  - \* I suggest writing gnuplot scripts directly and shelling out (or piping) to run them, instead of using an available python wrapper, as wrappers are less likely to be maintained than gnuplot itself.
- Pandoc 3.1.2 at <https://pandoc.org>
- It must be usable with and without a "screen reader".
- It should produce graphical, plain-text and audio representations of the data and metadata.
  - I suggest 'pandoc markdown' format plain-text output of the metadata (title, axis labels, ranges, etc) and tabular data as it easily readable with a screen-reader or a text-to-speech engine, plus it is readily convertible into HTML, PDF and other formats for sighted users, and can embed graphics and links to audio files.