# SE 101 Lab Project Proposal: Braille to Speech Converter

**Project**
The purpose of this project is to convert braille input into spoken phrases. Braille characters are composed of a 3x2 array of dots, each dot either being depressed or elevated. Users will input braille patterns using the numerical pad of a keyboard, or a 3x2 array of pressure-sensitive buttons. This will be converted to audio output from a speaker which will output every word inputted. This project will enable blind people, particularly those that are both blind and deaf to communicate with those that can hear.

This is intended primarily to be a proof of concept of the ability to convert braille input readily into speech. While the current input scheme is rather cumbersome, this will be improved upon in further iterations.

**Software Components**
Google Cloud Text-to-Speech API or IBM Watson Text to Speech
(Manually convert braille input to text and feed that as input to the API)

**Prototype Plan**
Initial prototyping will be primarily experimental and will be devoted to establishing an ability to correctly accept input from the buttons or the keyboard and an ability to correctly output audio information from the speaker. Vertical prototyping will also be used to explore usage of the text-to-speech APIs. Horizontal prototyping may be adopted later-on in the development process with a view to actually completing the project, but most prototyping will be vertical and experimental and individual components will be assembled together at the end instead of being evolutionarily developed.

**Hardware**
- Raspberry Pi 2B
- Push button switches (~6)
- Keyboard
- 2W speaker
- NIC card and Wi-Fi router (internet connection)
- Battery pack (for powering Raspberry Pi)

**Anticipated Challenges**
- Learning the API and I/O functions of a Raspberry Pi would have to be learned
- Converting Braille to Speech in real time such that a one-way communication can be established
- Debouncing of keyboard
- Collaboration using Git