User Acceptance Testing

The Soundoff software will be able to read in the following types of files:

1. Wav files of 8-bit, 16-bit and 24-bit size
2. Wav files with between 1 and 5 channels
3. Mp4 files of 16-bit, 24-bit, and 48-bit size
4. Mp4 files with between 1 and 5 channels

The Soundoff Software will then calculate the following values from types of files above:

1. The True Peak value in dbfs:
   1. Calculated by interpolating between sample peaks. We are using 3 different interpolation methods (with varying levels of conservatism) to find the true peak and then taking the median of these values as our True Peak Estimate. The three methods we are using are:
      1. Resampling using FFT
      2. Resampling using resampy
      3. Resampling using polyphase filtering
2. The Integrated Loudness in LUFs:
   1. Calculated by the python library pyloudnorm which uses an algorithm that implements  [ITU-R BS.1770-4](https://www.itu.int/dms_pubrec/itu-r/rec/bs/R-REC-BS.1770-4-201510-I!!PDF-E.pdf)
   2. Note that pyloudnorm only works for up to 5 channels, in the case that a file with 6 channels is passed into the program, Soundoff will inform the user that 5 channels is the max input

The Soundoff Software will produce a report that details the following information about the input file.

1. The LUFs and True Peak value
2. The difference between the LUFs and True Peak value of the file and the LUFs and True Peak value standards of selected platforms
   1. The difference will be Green and positive (indicating how much the value can be increased by and still pass the platform’s standard) if the input file would pass the platform’s standard and be accepted without adjustment.
   2. The difference will be Yellow if the input file is within a certain margin of the platform’s standards. The value will be positive if it is below the cutoff(indicating how much the value can be increased by and still pass the platform’s standard). The value will be negative if it exceeds the cutoff (indicating how much the value will need to be decreased by in order to pass the platform’s standard)
      1. Within .5 dbfs of the platform’s True Peak standard
      2. Within 2 LUFs of the platform’s LUFs standard
   3. The difference will be in Red and negative (indicating how much the value will need to be decreased by in order to pass the platform’s standard) if the input file would not pass the platform’s standard and would not be accepted without being adjusted (either by the platform or the user).

The Soundoff Software will also have the following features:

1. The ability to add a new platform/standard for files to be compared against
2. The ability to modify/delete existing platforms/standards loaded into the software
3. The ability to view the existing platforms/standards loaded into the software