IOT 649 - Nawaz KH , Abin Francis - Assignment 2

Report

- Low pass RC filter designed with a 0.01 micro farad capacitor (103) and total resistance of 2k ohms. Tested with an oscilloscope and working as intended.
- Particle programmed to read the audio input for exactly 5 seconds after button is pressed and after a successful connection to the cloud is established.
- Cloud server TCP setup using port numbers 29500 and 29501 for either of us.
- A simple Python HTML server set up using port number 11000 and 11001, one for each for us.
- audioserver.js file setup with a sample rate same as that of the program running on the Photon and uploaded to the server.
- Successfully created connection and uploaded audio to the cloud.
- Successfully played back 5 seconds of audio uploaded to the cloud using a web browser plugin or by directly downloading it.

Observations

- Test cases:
- Sample rate of 44000 (2 times 22kHz) and a buffer size of 2048 * 16 bits.
- Multiple buffer full warnings. Slight over-sampling of normal speech and sound in the audible range of human speech and instruments.
- Sample rate of 44000 (2 times 22kHz) and a buffer size of 1024 * 16 bits.
- Multiple buffer full warnings. Observed to be better with regards to human speech.
- Sample rate of 44000 (2 times 22kHz) and a buffer size of 512 * 16 bits.
- Fewer buffer full warnings.
- Sample rate of 44000 (2 times 22kHz) and a buffer size of 256 * 16 bits.
- Horrible replication of audio and a massive number of buffer full warnings.
- Sample rate of 44000 (2 times 22kHz) and a buffer size of 4096 * 16 bits.
- Same observation as with a 2048 * 16 bit buffer size.
- Sample rate of 32000 (2 times 16kHz) and a buffer size of 2048 * 16 bits.
- Better replication of input audio.
- Sample rate of 38000 (2 times 19kHz) and a buffer size of 2048 * 16 bits.
- Even better replication of input audio.
- Sample rate of 32000 (2 times 16kHz) and a buffer size of 2048 * 16 bits.
- Best replication of input audio with a handful of buffer overflows.
- Sample rate of 22000 (2 times 11kHz) and a buffer size of 2048 * 16 bits.
- Best replication of input audio of normal human speech and instruments with minimal to no buffer overflows.

We also observed that reducing the switch cases in the code(in the loop) while sampling helped in capturing smooth audio.