## Massachusetts Institute of Technology Department of Electrical Engineering and Computer Science 6.111 - Introductory Digital Systems Laboratory

# **Final Project Check Off Sheet**

Project Title: Voice Training Karaoke Machine

Student Names: Masood Qazi, Zhongying Zhou

TA Name: Jae Lee

TA Signature/Date:

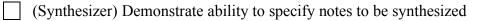
#### <u>Design</u>

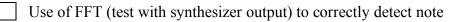
State transition diagrams, Block Diagrams, Code (Top-level, Synthesizer, FFT, AC97 interface, Song reader, Display)

### **Functionality**

#### MQ

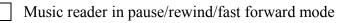
Digital loop-back from microphone to headphone to verify audio interface

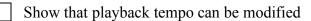




# ZZ

Ability to read note sequence from memory in normal play mode (LED)





VGA display of time series (voice and/or tone samples) and FFT

### MQ + ZZ

Demonstrate meaningful user experience through attempted sing-along with pre-set song

Demonstrate single note tuning mode, in which user tunes his/her voice to a constantly held note with audio and visual feedback

### **Functionality**

How do you interpret a frequency spectrum into a single note?
What are the considerations for synthesizing a "useful" vocal note?
Describe timing and synchronization challenges with an AC97 codec.
Discuss design choices for pause/ff/rewind functions and how it is implemented with respect to the tempo of the song.
How do you time memory access of display data with pixel output?
What features would you add to this project in the future?