

# 2618 C Programming – Final Project

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## 1 Instructor Presentation on Final Project

**Tuesday April 9, 2019**

## 2 Project Proposal

**Due 11PM Thursday April 25, 2019**

Students must create a written proposal for their final project. The proposal does not have to be more than 1 page in length, but must have:

- A description of the objective of program and an explanation of the context or in which the program might be used.
- Major functional blocks in program. This could be a list or a diagram.
- Indicate the functional blocks for code that you will write (i.e. excluding the functionality provided by any libraries that you will use).
- Indicate libraries that you expect to use (e.g. PortAudio or libsndfile).
- The platform on which you will implement the project (e.g. Mac OS X or Windows/Cygwin).

## 3 Submit Project Report and Source Code

**Due 1PM Tuesday May 7<sup>th</sup>, 2019**

### 3.1 What is Submitted

Please send back via NYU Classes

- A zip archive named as  
FP\_<your name as FirstLast>.zip  
containing
  - The project report, as \*.pdf
  - The project source code. (in its own director, e.g. “code”)
  - Any necessary signal or data files needed to build and run the code

### 3.2 Project Report

Students must submit a written report for their final project. The report document should be in \*.pdf format. The report can be 2-5 pages in length, but must have:

- A description of the objective of program.
- A description of the context in which the program might be used.
- A diagram showing the signal flow in the program and indicating major functional blocks.
  - Indicate which blocks correspond to code that you have written. Indicate which filenames and function names are associated with each of the functional blocks for code that you wrote.

- Indicate which blocks correspond to functionality provided by libraries that you have used.
- Discuss the computational complexity of the program. What are the functional blocks that are most complex? Estimate the “Big-O” complexity.
- The platform on which you implemented the project (e.g. Mac OS X or Windows/Cygwin).

Give the command line used to compile the program. This must include support for any libraries you used (i.e. where are include files and library files).

Give example command lines that can be used to run the program.

### 3.3 Project Source Code

Provide all C code, a compilation command line and any data files or audio signal files such that the instructor can build and run your program.

C code must be logically organized and sufficiently commented to make clear the purpose of each function. Students are strongly encouraged to divide code into multiple files in which each file contains functions that implement some common objective.

## 4 Presentation to Class

**Tuesday May 7<sup>st</sup> and Thursday May 9<sup>th</sup>, 2019 (both lecture and lab periods)**

All students will make a short (not more than 15 minutes) presentation to the class that consists of

- Oral presentation of Report materials, using slides that help describe the project
- Demonstrate the project in execution, with audio I/O if appropriate

## 5 Grading Rubric

Points	Project Component
20	Project Proposal
75	Project Report
75	Project Source Code
30	Project Presentation and demonstration
200	Total

## 6 Project Ideas

### 6.1 Head-Related Transfer Function (HRTF) Sound Source Localization

See FinalProjectExample-HRTF.zip in the folder:

NYU Classes/Recources/Final Project

This contains examples of:

- Project proposal
- Project report write-up
- Source code
- Slides for class presentation

## 6.2 Audio Effect Processor

Use the PS Audio Effects code and put your own audio effects in the callback. This might be:

- Your own compressor
- “Fuzz Box” signal distortion
- Use your imagination!

## 6.3 Synthesizer

With PortAudio and Ncurses, turn your laptop keyboard into an instrument keyboard. Each key might play a tone or note. You could impose an exponential decay on the current note until a next note is played. You could have “meta-keys” to implement chords.

## 6.4 Other

Use your imagination!