General Objective:
The objective of this assignment is to provide students with the opportunity to
demonstrate their ability to explain the application of digital audio technology in a
product development scenario. This will require both the explanation of
fundamental digital audio principles and a specification of how a practical
problem can be solved using digital audio signal processing (DSP).

You should target a group of venture capitalists who will decide whether or not to
invest money in a proposed product development scheme: You may assume that
they are sophisticated in marketing new products, so your pitch need not deal
with marketing issues at all; rather, they will be evaluating your proposal on the
grounds of how clearly you can present your ideas, and whether it seems that
you will be able to provide the technology that will be required. You may also
assume that they have a strong engineering background, but you should not
assume that they are experts in DSP (so they will need a complete explanation).

This written assignment may be closely linked with the signal processing project
that you completed in conjunction with your submitted Lab Report, but is quite
distinct: While the DSP solution on which the written assignment was based
might be well described in the Lab Report, that description was intended for a
reader who knows Matlab, and who might like to use the routines that you have
developed. In contrast, the audience for this final written review will be more
interested in hearing your pitch for some new software or hardware, and your
pitch will benefit from sound examples that are produced by your prototype
(which could use the Matlab code associated with your recent Lab Report).

Deliverable: To successfully complete this assignment students will submit
typewritten text of about 1200 words (about 4 pages) to explain the audio product
development project that they have chosen. The text should include at least one
original diagram to present the details of the proposed DSP application (not
copied from another publication). In explaining the fundamental digital audio
principles associated with the application, a mathematical specification of the
applied DSP technique(s) should be included (e.g., equations specifying how
filter output samples are calculated from input samples). The key to success here
is to present the product development in such a way that there is no doubt in the
readers’ minds you will be able to complete the work by a projected date: There
should be no uncertain details in this functional specification.
Please cover the following points:

1. Problem Description
2. Specification
3. Implementation
4. Evaluation (to demonstrate that the solution meets engineering specs)

Extra credit:
Besides the physical evaluation of the DSP solution in terms of whether it produces output audio signals as specified, propose a method for how its performance might be assessed for a human user (assuming this is appropriate). If the digital audio signal processing problem addressed is not for a human user, then the extra credit item must be designed to show how system performance may be assessed according to some use-case scenario (distinct from evaluation in terms of the functional specification previously addressed).

Submission detail:
This written assignment is to be posted online via the University of Sydney’s eScholarship Repository at the following URL: http://ses.library.usyd.edu.au/

Note that the submission will consist of multiple items in various formats, and should not be zipped up into a single archive for uploading (i.e., do not submit contents as a zipfile). For sake of visitors browsing the eScholarship Repository, the PDF-format written text should be accompanied by demonstrations that should feature individual soundfiles in Waveform Audio File (WAVE) format.

More details on the format of the submission will be presented during the 26 April class meeting.