MMP305 Fall 2023 Midterm Written Assignment:

1. **Introduction:**

This should be an overview of the build. You can choose to describe the problem that you meant to solve or address with the build.

2. **Body:**

The body of the paper needs to convey the system under demonstration. You should include sub sections with:

1. Reference to prior art or hardware designs
2. A system flow chart
3. Measurements of:
    - Distortion
    - Frequency response
    - Noise burst response for compressors
4. Relevant formulas

3. **Conclusion:**

1. Things that were easy
2. Things that were hard
3. Problems to overcome
4. Remaining/Unsolved issues
5. Future improvements

General advice on whitepapers

A whitepaper is typically aimed at an informed but not absolute expert audience. It should not be so esoteric that it is lost on non-experts, but not so trivial that no technical information is conveyed. Focus on things that you can prove and adequately display. Focus on information that is truly relevant to the build. It is generally highly advisable to study some prior art so that statements can be backed up with quotations. Make sure that your introduction sufficiently outlines the outset and problem/hypothesis to be addressed and that your conclusion provides a good summary and a clear outcome.

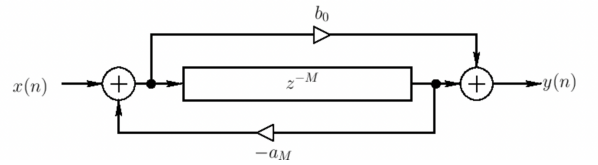
System Design

This is an annotated, clear flow-chart. Similar to the system design charts we have developed for each of our builds. The most critical points to show are signal processing elements such as additions, multiplications, inversions, rectification, conversions, delay, etc…

Symbols:

+	add
-	subtract
|x|	absolute value
-(x)	invert
	Multiplication

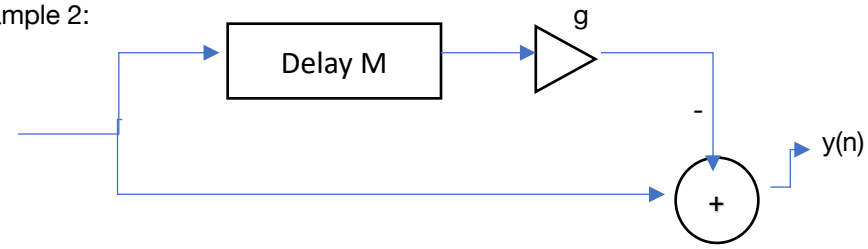
Example 1:



This is an allpass filter with a feedforward and a feedback flow.
The feedforward signal on the top is multiplied by the positive value b_0, the feedback loop is multiplied by the negative value $-a_M$.

You can at all times represent components at a high level with a descriptor.

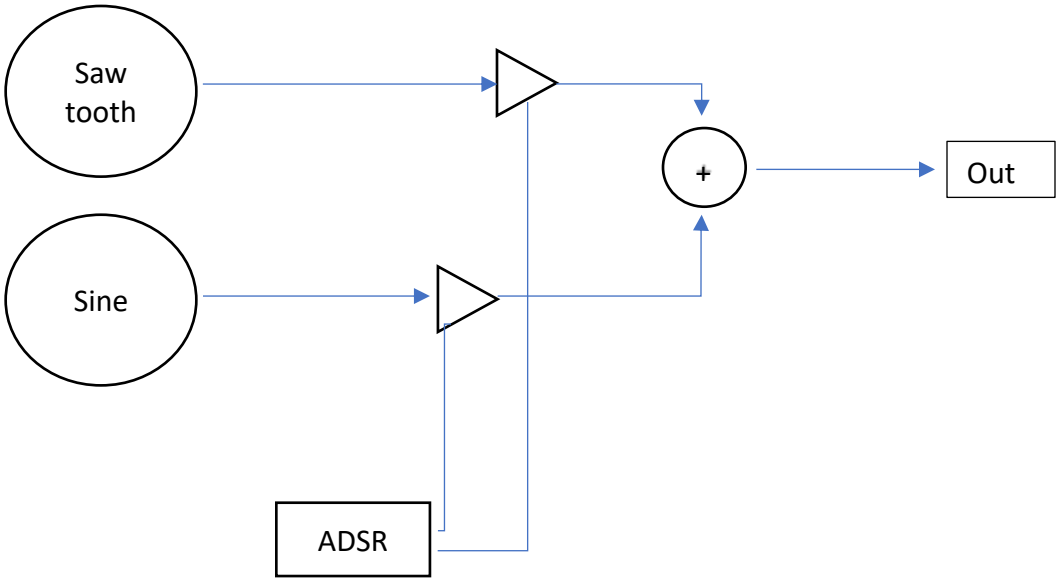
Example 2:



In Example 2, our signal x(n) is duplicated then runs through a delay of M length, is multiplied by the variable g and is then subtracted from the original signal (*note the minus symbol at the addition).*

If your build does not process an external source but is a sound generator, such as a synthesizer, you can show your starting signal in the form of an oscillator.

Example 3:



Example 3 is a simple two source system, each source being controlled by an ADSR envelope and then added together. *Note:* The ADSR envelope is shown as a high level component. Is not necessary in this case to show it in more detail to demonstrate the flow of the system.

The Reaktor build

This should run without issue and be stable. It should fulfill the function as described. An expert user should not be the intended audience. A good design does not need to be complicated.
The GUI should be aesthetically pleasing but clear and functional.

Submit all Elements in a Onedrive folder and submit the shared link through canvas:

MMP305_MT_Yourname.PDF for the E-Brief and signal flow chart
MMP305_MT_Yourname.ens for the Reaktor ensemble.