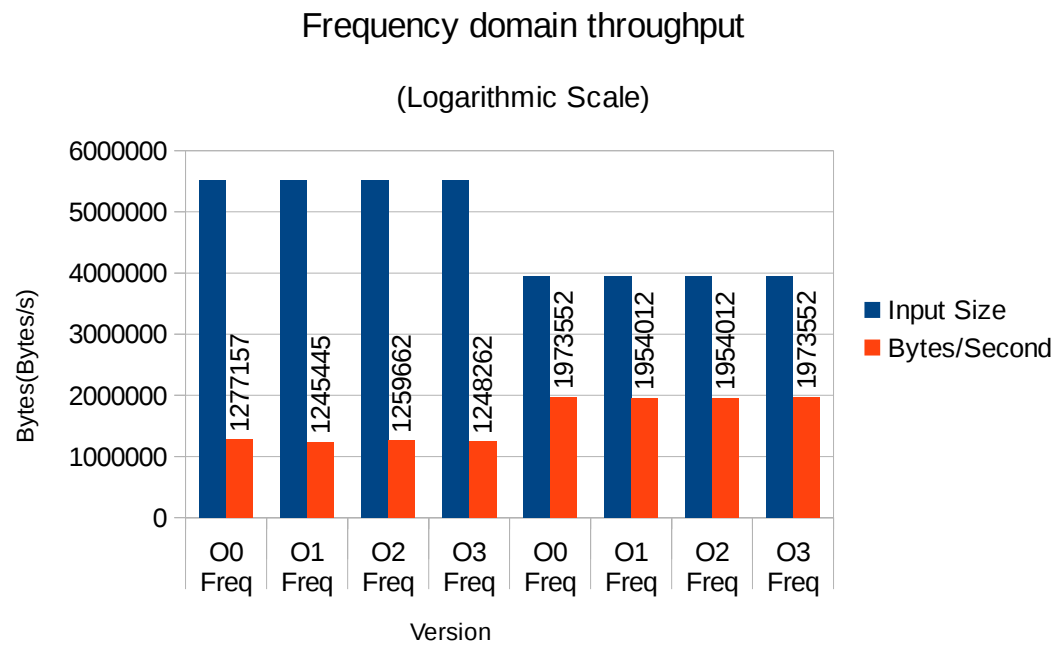
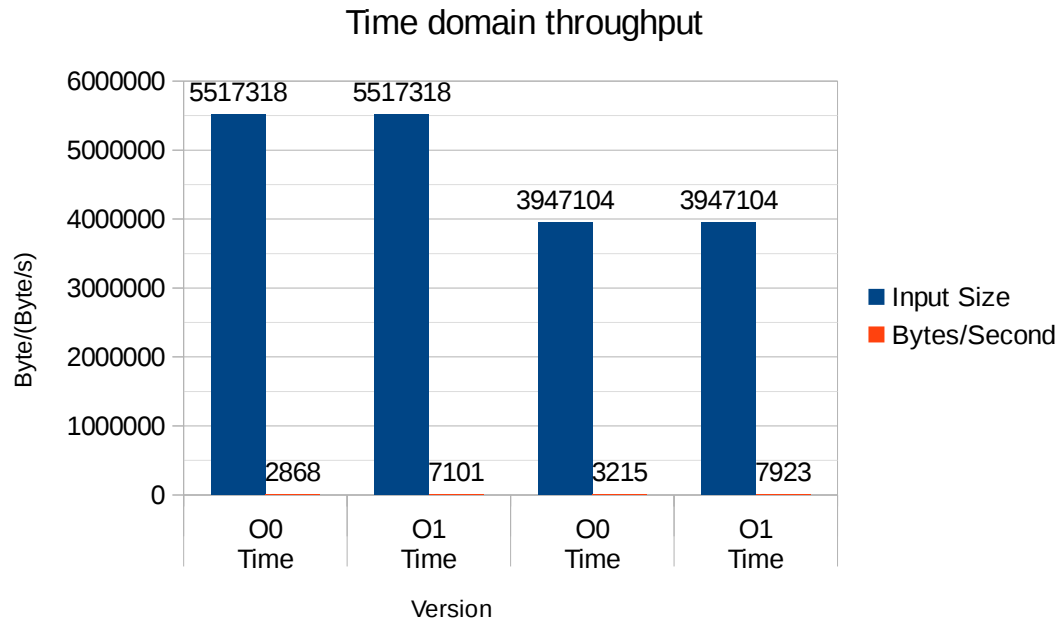


## Optimization Analysis



## Optimization Analysis

### Inputs Tested

| Input       | Size (Bytes) |
|-------------|--------------|
| FluteDry    | 5304074      |
| BIG HALL IR | 213244       |
| GuitarDry   | 3538990      |
| BriteHallIR | 408114       |

### Overview Analysis

| Domain | Version | Time(s) | Input Size | Bytes/Second |
|--------|---------|---------|------------|--------------|
| Time   | O0      | 1923.87 | 5517318    | 2868         |
| Time   | O1      | 777.06  | 5517318    | 7101         |
| Time   | O0      | 1228    | 3947104    | 3215         |
| Time   | O1      | 498.2   | 3947104    | 7923         |
| Freq   | O0      | 4.32    | 5517318    | 1277157      |
| Freq   | O1      | 4.43    | 5517318    | 1245445      |
| Freq   | O2      | 4.38    | 5517318    | 1259662      |
| Freq   | O3      | 4.42    | 5517318    | 1248262      |
| Freq   | O0      | 2       | 3947104    | 1973552      |
| Freq   | O1      | 2.02    | 3947104    | 1954012      |
| Freq   | O2      | 2.02    | 3947104    | 1954012      |
| Freq   | O3      | 2       | 3947104    | 1973552      |

### Raw Profile Data

Flute Big Hall Time D O0

| Time % | Cumulative S | Self seconds | function                |
|--------|--------------|--------------|-------------------------|
| 100.13 | 1923.87      | 1923.87      | convolve                |
| 0      | 1923.89      | 0.02         | shortArrToFloat         |
| 0      | 1923.91      | 0.02         | floatArrToShort         |
| 0      | 1923.92      | 0.01         | write_little_endian     |
| 0      | 1923.93      | 0.01         | getMaxElement           |
| 0      | 1923.94      | 0.01         | getMinElement           |
| 0      | 1923.95      | 0.01         | getMaxElementFloat      |
| 0      | 1923.96      | 0.01         | saveOutput              |
| 0      | 1923.96      | 0            | displayArray            |
| 0      | 1923.96      | 0            | displayArrayHeaderField |
| 0      | 1923.96      | 0            | displayFloatArrData     |
| 0      | 1923.96      | 0            | displayHeaderInfo       |
| 0      | 1923.96      | 0            | displayShortArrData     |
| 0      | 1923.96      | 0            | getHeaderInfo           |
| 0      | 1923.96      | 0            | getWavData              |
| 0      | 1923.96      | 0            | cleanup                 |
| 0      | 1923.96      | 0            | displayTestInformation  |

Flute Big Hall Time D O1

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 100.13 | 777.06       | 777.06       | convolve            |
| 0      | 777.08       | 0.02         | shortArrToFloat     |
| 0      | 777.09       | 0.01         | write_little_endian |

### Optimization Analysis

|   |        |      |                    |
|---|--------|------|--------------------|
| 0 | 777.1  | 0.01 | floatArrToShort    |
| 0 | 777.11 | 0.01 | getMaxElementFloat |
| 0 | 777.12 | 0.01 | saveOutput         |
| 0 | 777.12 | 0    | getHeaderInfo      |
| 0 | 777.12 | 0    | getWavData         |
| 0 | 777.12 | 0    | cleanup            |

Flute Big Hall Time D O2      FAILED – seg fault

Frequency Flute Big Hall O0

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 96.53  | 4.32         | 4.32         | fft                 |
| 1.12   | 4.37         | 0.05         | normalizeArray      |
| 0.45   | 4.39         | 0.02         | getMaxElementDouble |
| 0.45   | 4.41         | 0.02         | multiplyComplex     |
| 0.22   | 4.42         | 0.01         | doubleArrToShort    |
| 0.22   | 4.43         | 0.01         | getMinElement       |
| 0.22   | 4.44         | 0.01         | postprocessData     |
| 0.22   | 4.45         | 0.01         | preprocessData      |
| 0.22   | 4.46         | 0.01         | saveOutput          |
| 0.22   | 4.47         | 0.01         | shortArrToDouble    |
| 0.22   | 4.48         | 0.01         | write_little_endian |

Frequency Flute Big Hall O1

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 96.2   | 4.43         | 4.43         | fft                 |
| 1.09   | 4.48         | 0.05         | normalizeArray      |
| 0.65   | 4.51         | 0.03         | multiplyComplex     |
| 0.65   | 4.54         | 0.03         | write_little_endian |
| 0.43   | 4.56         | 0.02         | getMaxElementDouble |
| 0.43   | 4.58         | 0.02         | postprocessData     |
| 0.22   | 4.59         | 0.01         | getMinElement       |
| 0.22   | 4.6          | 0.01         | preprocessData      |
| 0.22   | 4.61         | 0.01         | shortArrToDouble    |

Frequency Flute Big Hall O2

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 96.15  | 4.38         | 4.38         | fft                 |
| 1.1    | 4.43         | 0.05         | normalizeArray      |
| 0.66   | 4.46         | 0.03         | multiplyComplex     |
| 0.66   | 4.49         | 0.03         | write_little_endian |
| 0.44   | 4.51         | 0.02         | getMaxElementDouble |
| 0.22   | 4.52         | 0.01         | doubleArrToShort    |
| 0.22   | 4.53         | 0.01         | getMinElement       |
| 0.22   | 4.54         | 0.01         | postprocessData     |
| 0.22   | 4.55         | 0.01         | preprocessData      |
| 0.22   | 4.56         | 0.01         | shortArrToDouble    |

## Optimization Analysis

### Frequency Flute Big Hall O3

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 95.77  | 4.42         | 4.42         | fft                 |
| 1.08   | 4.47         | 0.05         | normalizeArray      |
| 0.65   | 4.5          | 0.03         | multiplyComplex     |
| 0.65   | 4.53         | 0.03         | shortArrToDouble    |
| 0.43   | 4.55         | 0.02         | getMaxElement       |
| 0.43   | 4.57         | 0.02         | getMaxElementDouble |
| 0.43   | 4.59         | 0.02         | preprocessData      |
| 0.22   | 4.6          | 0.01         | doubleArrToShort    |
| 0.22   | 4.61         | 0.01         | getMinElement       |
| 0.22   | 4.62         | 0.01         | postprocessData     |

### Time Guitar Brite Hall O0

| Time % | Cumulative S | Self seconds | function                |
|--------|--------------|--------------|-------------------------|
| 100.13 | 1228.4       | 1228.4       | convolve                |
| 0      | 1228.43      | 0.03         | shortArrToFloat         |
| 0      | 1228.44      | 0.02         | write_little_endian     |
| 0      | 1228.45      | 0.01         | getMinElement           |
| 0      | 1228.46      | 0.01         | floatArrToShort         |
| 0      | 1228.47      | 0.01         | getMaxElementFloat      |
| 0      | 1228.48      | 0.01         | normalizeArray          |
| 0      | 1228.49      | 0.01         | saveOutput              |
| 0      | 1228.49      | 0            | displayArray            |
| 0      | 1228.49      | 0            | displayArrayHeaderField |
| 0      | 1228.49      | 0            | displayFloatArrData     |
| 0      | 1228.49      | 0            | displayHeaderInfo       |
| 0      | 1228.49      | 0            | displayShortArrData     |
| 0      | 1228.49      | 0            | getHeaderInfo           |
| 0      | 1228.49      | 0            | getMaxElement           |
| 0      | 1228.49      | 0            | getWavData              |
| 0      | 1228.49      | 0            | cleanup                 |
| 0      | 1228.49      | 0            | displayTestInformation  |

### Time Guitar Brite Hall O1

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 100.13 | 498.26       | 498.26       | convolve            |
| 0      | 498.27       | 0.01         | normalizeArray      |
| 0      | 498.28       | 0.01         | saveOutput          |
| 0      | 498.28       | 0            | write_little_endian |
| 0      | 498.28       | 0            | getHeaderInfo       |
| 0      | 498.28       | 0            | getWavData          |
| 0      | 498.28       | 0            | shortArrToFloat     |
| 0      | 498.28       | 0            | cleanup             |
| 0      | 498.28       | 0            | floatArrToShort     |
| 0      | 498.28       | 0            | getMaxElementFloat  |

## Optimization Analysis

### Freq Guitar Brite Hall O0

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 96.26  | 2            | 2            | fft                 |
| 0.96   | 2.02         | 0.02         | normalizeArray      |
| 0.48   | 2.03         | 0.01         | doubleArrToShort    |
| 0.48   | 2.04         | 0.01         | getMaxElement       |
| 0.48   | 2.05         | 0.01         | getMaxElementDouble |
| 0.48   | 2.06         | 0.01         | multiplyComplex     |
| 0.48   | 2.07         | 0.01         | preprocessData      |
| 0.48   | 2.08         | 0.01         | shortArrToDouble    |

### Freq Guitar Brite Hall O1

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 95.38  | 2.02         | 2.02         | fft                 |
| 0.94   | 2.04         | 0.02         | shortArrToDouble    |
| 0.47   | 2.05         | 0.01         | getMaxElementDouble |
| 0.47   | 2.06         | 0.01         | getMinElement       |
| 0.47   | 2.07         | 0.01         | multiplyComplex     |
| 0.47   | 2.08         | 0.01         | normalizeArray      |
| 0.47   | 2.09         | 0.01         | postprocessData     |
| 0.47   | 2.1          | 0.01         | preprocessData      |
| 0.47   | 2.11         | 0.01         | saveOutput          |
| 0.47   | 2.12         | 0.01         | write_little_endian |

### Freq Guitar Brite Hall O2

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 94.91  | 2.01         | 2.01         | fft                 |
| 0.94   | 2.03         | 0.02         | shortArrToDouble    |
| 0.71   | 2.05         | 0.02         | saveOutput          |
| 0.71   | 2.06         | 0.02         | write_little_endian |
| 0.47   | 2.07         | 0.01         | doubleArrToShort    |
| 0.47   | 2.08         | 0.01         | getMaxElement       |
| 0.47   | 2.09         | 0.01         | getMaxElementDouble |
| 0.47   | 2.1          | 0.01         | multiplyComplex     |
| 0.47   | 2.11         | 0.01         | normalizeArray      |
| 0.47   | 2.12         | 0.01         | preprocessData      |

### Freq Guitar Brite Hall O3

| Time % | Cumulative S | Self seconds | function            |
|--------|--------------|--------------|---------------------|
| 95.79  | 2            | 2            | fft                 |
| 0.96   | 2.02         | 0.02         | multiplyComplex     |
| 0.48   | 2.03         | 0.01         | getMaxElement       |
| 0.48   | 2.04         | 0.01         | getMaxElementDouble |
| 0.48   | 2.05         | 0.01         | normalizeArray      |
| 0.48   | 2.06         | 0.01         | postprocessData     |
| 0.48   | 2.07         | 0.01         | preprocessData      |
| 0.48   | 2.08         | 0.01         | saveOutput          |

## Optimization Analysis

|      |      |      |                  |
|------|------|------|------------------|
| 0.48 | 2.09 | 0.01 | shortArrToDouble |
|------|------|------|------------------|