

Experimente:

1

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=60.0)
```

```
compare_times_gpu('test_signal.wav', block_size=128, offset=10, threshold=1000, num_gpus=10)
```

```
Frequency: 0.00 Hz, Mean Amplitude: 254478.88
Frequency: 344.53 Hz, Mean Amplitude: 924426.52
Frequency: 689.06 Hz, Mean Amplitude: 357366.66
Frequency: 1033.59 Hz, Mean Amplitude: 154263.00
Frequency: 1378.12 Hz, Mean Amplitude: 100180.15
Frequency: 1722.66 Hz, Mean Amplitude: 74862.01
Frequency: 2067.19 Hz, Mean Amplitude: 60066.43
Frequency: 2411.72 Hz, Mean Amplitude: 50313.87
Frequency: 2756.25 Hz, Mean Amplitude: 43377.38
Frequency: 3100.78 Hz, Mean Amplitude: 38181.29
Frequency: 3445.31 Hz, Mean Amplitude: 34140.07
Frequency: 3789.84 Hz, Mean Amplitude: 30904.37
Frequency: 4134.38 Hz, Mean Amplitude: 28253.93
Frequency: 4478.91 Hz, Mean Amplitude: 26044.06
Frequency: 4823.44 Hz, Mean Amplitude: 24173.25
Frequency: 5167.97 Hz, Mean Amplitude: 22569.12
Frequency: 5512.50 Hz, Mean Amplitude: 21179.34
Frequency: 5857.03 Hz, Mean Amplitude: 19964.25
Frequency: 6201.56 Hz, Mean Amplitude: 18893.16
Frequency: 6546.09 Hz, Mean Amplitude: 17942.53
Frequency: 6890.62 Hz, Mean Amplitude: 17094.02
Frequency: 7235.16 Hz, Mean Amplitude: 16332.17
Frequency: 7579.69 Hz, Mean Amplitude: 15644.76
Frequency: 7924.22 Hz, Mean Amplitude: 15022.38
Frequency: 8268.75 Hz, Mean Amplitude: 14456.35
Frequency: 8613.28 Hz, Mean Amplitude: 13939.84
Frequency: 8957.81 Hz, Mean Amplitude: 13467.10
Frequency: 9302.34 Hz, Mean Amplitude: 13033.73
Frequency: 9646.88 Hz, Mean Amplitude: 12634.20
Frequency: 9991.41 Hz, Mean Amplitude: 12266.04
Frequency: 10335.94 Hz, Mean Amplitude: 11926.14
Frequency: 10680.47 Hz, Mean Amplitude: 11611.33
Frequency: 11025.00 Hz, Mean Amplitude: 11319.56
Frequency: 11369.53 Hz, Mean Amplitude: 11048.64
Frequency: 11714.06 Hz, Mean Amplitude: 10796.91
Frequency: 12058.59 Hz, Mean Amplitude: 10562.63
Frequency: 12403.12 Hz, Mean Amplitude: 10344.57
Frequency: 12747.66 Hz, Mean Amplitude: 10141.44
Frequency: 13092.19 Hz, Mean Amplitude: 9951.97
Frequency: 13436.72 Hz, Mean Amplitude: 9775.36
Frequency: 13781.25 Hz, Mean Amplitude: 9610.68
Frequency: 14125.78 Hz, Mean Amplitude: 9457.09
Frequency: 14470.31 Hz, Mean Amplitude: 9313.88
Frequency: 14814.84 Hz, Mean Amplitude: 9180.56
Frequency: 15159.38 Hz, Mean Amplitude: 9056.36
Frequency: 15503.91 Hz, Mean Amplitude: 8940.73
Frequency: 15848.44 Hz, Mean Amplitude: 8833.47
Frequency: 16192.97 Hz, Mean Amplitude: 8733.95
Frequency: 16537.50 Hz, Mean Amplitude: 8641.80
Frequency: 16882.03 Hz, Mean Amplitude: 8556.72
Frequency: 17226.56 Hz, Mean Amplitude: 8478.57
Frequency: 17571.09 Hz, Mean Amplitude: 8406.52
Frequency: 17915.62 Hz, Mean Amplitude: 8340.58
Frequency: 18260.16 Hz, Mean Amplitude: 8281.89
Frequency: 18604.69 Hz, Mean Amplitude: 8227.80
Frequency: 18949.22 Hz, Mean Amplitude: 8179.43
Frequency: 19293.75 Hz, Mean Amplitude: 8136.83
Frequency: 19638.28 Hz, Mean Amplitude: 8099.45
```

Frequency: 19982.81 Hz, Mean Amplitude: 8067.22
Frequency: 20327.34 Hz, Mean Amplitude: 8040.17
Frequency: 20671.88 Hz, Mean Amplitude: 8018.12
Frequency: 21016.41 Hz, Mean Amplitude: 8001.09
Frequency: 21360.94 Hz, Mean Amplitude: 7988.94
Frequency: 21705.47 Hz, Mean Amplitude: 7981.59
Frequency: 22050.00 Hz, Mean Amplitude: 7979.19
Original function time: 1.6694 seconds
Frequency: 0.00 Hz, Mean Amplitude: 254326.70
Frequency: 344.53 Hz, Mean Amplitude: 924830.38
Frequency: 689.06 Hz, Mean Amplitude: 356444.75
Frequency: 1033.59 Hz, Mean Amplitude: 154118.50
Frequency: 1378.12 Hz, Mean Amplitude: 100394.19
Frequency: 1722.66 Hz, Mean Amplitude: 74984.98
Frequency: 2067.19 Hz, Mean Amplitude: 59939.00
Frequency: 2411.72 Hz, Mean Amplitude: 50267.01
Frequency: 2756.25 Hz, Mean Amplitude: 43419.80
Frequency: 3100.78 Hz, Mean Amplitude: 38134.36
Frequency: 3445.31 Hz, Mean Amplitude: 34104.70
Frequency: 3789.84 Hz, Mean Amplitude: 30974.03
Frequency: 4134.38 Hz, Mean Amplitude: 28248.29
Frequency: 4478.91 Hz, Mean Amplitude: 26095.30
Frequency: 4823.44 Hz, Mean Amplitude: 24165.49
Frequency: 5167.97 Hz, Mean Amplitude: 22574.14
Frequency: 5512.50 Hz, Mean Amplitude: 21221.64
Frequency: 5857.03 Hz, Mean Amplitude: 19991.86
Frequency: 6201.56 Hz, Mean Amplitude: 18872.44
Frequency: 6546.09 Hz, Mean Amplitude: 17986.67
Frequency: 6890.62 Hz, Mean Amplitude: 17069.10
Frequency: 7235.16 Hz, Mean Amplitude: 16291.32
Frequency: 7579.69 Hz, Mean Amplitude: 15684.87
Frequency: 7924.22 Hz, Mean Amplitude: 15004.63
Frequency: 8268.75 Hz, Mean Amplitude: 14464.17
Frequency: 8613.28 Hz, Mean Amplitude: 13946.50
Frequency: 8957.81 Hz, Mean Amplitude: 13446.45
Frequency: 9302.34 Hz, Mean Amplitude: 13060.20
Frequency: 9646.88 Hz, Mean Amplitude: 12644.12
Frequency: 9991.41 Hz, Mean Amplitude: 12229.97
Frequency: 10335.94 Hz, Mean Amplitude: 11926.80
Frequency: 10680.47 Hz, Mean Amplitude: 11637.12
Frequency: 11025.00 Hz, Mean Amplitude: 11330.86
Frequency: 11369.53 Hz, Mean Amplitude: 11004.81
Frequency: 11714.06 Hz, Mean Amplitude: 10775.29
Frequency: 12058.59 Hz, Mean Amplitude: 10563.74
Frequency: 12403.12 Hz, Mean Amplitude: 10368.94
Frequency: 12747.66 Hz, Mean Amplitude: 10158.84
Frequency: 13092.19 Hz, Mean Amplitude: 9954.37
Frequency: 13436.72 Hz, Mean Amplitude: 9732.26
Frequency: 13781.25 Hz, Mean Amplitude: 9586.25
Frequency: 14125.78 Hz, Mean Amplitude: 9431.28
Frequency: 14470.31 Hz, Mean Amplitude: 9309.40
Frequency: 14814.84 Hz, Mean Amplitude: 9191.40
Frequency: 15159.38 Hz, Mean Amplitude: 9078.06
Frequency: 15503.91 Hz, Mean Amplitude: 8961.42
Frequency: 15848.44 Hz, Mean Amplitude: 8847.15
Frequency: 16192.97 Hz, Mean Amplitude: 8734.27
Frequency: 16537.50 Hz, Mean Amplitude: 8640.51
Frequency: 16882.03 Hz, Mean Amplitude: 8551.61
Frequency: 17226.56 Hz, Mean Amplitude: 8447.23
Frequency: 17571.09 Hz, Mean Amplitude: 8385.13
Frequency: 17915.62 Hz, Mean Amplitude: 8324.79
Frequency: 18260.16 Hz, Mean Amplitude: 8266.35
Frequency: 18604.69 Hz, Mean Amplitude: 8214.45
Frequency: 18949.22 Hz, Mean Amplitude: 8164.64
Frequency: 19293.75 Hz, Mean Amplitude: 8108.94
Frequency: 19638.28 Hz, Mean Amplitude: 8078.34
Frequency: 19982.81 Hz, Mean Amplitude: 8052.07

Frequency: 20327.34 Hz, Mean Amplitude: 8025.76
Frequency: 20671.88 Hz, Mean Amplitude: 8009.39
Frequency: 21016.41 Hz, Mean Amplitude: 7991.81
Frequency: 21360.94 Hz, Mean Amplitude: 7978.24
Frequency: 21705.47 Hz, Mean Amplitude: 7971.28
Frequency: 22050.00 Hz, Mean Amplitude: 7969.96
Parallel function time: 53.4963 seconds
Speedup: 0.03x

2

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=30.0)
compare_times_gpu('test_signal.wav', block_size=256, offset=10, threshold=1000, num_gpus=10)
```

Original function time: 0.9942 seconds
Parallel function time: 26.2759 seconds
Speedup: 0.04x

3

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=30.0)
compare_times_gpu('test_signal.wav', block_size=256, offset=10, threshold=100000, num_gpus=50)
```

Original function time: 0.9802 seconds
Parallel function time: 30.6899 seconds
Speedup: 0.03x

4

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=30.0)
compare_times_cpu('test_signal.wav', block_size=256, offset=10, threshold=100000, num_cores=2)
```

Original function time: 0.9922 seconds
Parallel function time: 2.7044 seconds
Speedup: 0.37x

5

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=30.0)
compare_times_cpu('test_signal.wav', block_size=256, offset=10, threshold=100000, num_cores=8)
```

Original function time: 0.9812 seconds
Parallel function time: 3.7491 seconds
Speedup: 0.26x

6

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=300.0)
compare_times_cpu('test_signal.wav', block_size=256, offset=10, threshold=100000, num_cores=8)
```

Original function time: 9.9202 seconds
Parallel function time: 10.2893 seconds
Speedup: 0.96x

7

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=1200.0)  
compare_times_cpu('test_signal.wav', block_size=256, offset=10, threshold=100000, num_cores=8)
```

Original function time: 40.7951 seconds
Parallel function time: 119.6206 seconds
Speedup: 0.34x

8

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=30.0)  
compare_times_cpu('test_signal.wav', block_size=256, offset=100, threshold=100000, num_cores=8)
```

Original function time: 0.1250 seconds
Parallel function time: 3.0104 seconds
Speedup: 0.04x

9

```
generate_wav_file('test_signal.wav', frequency=440, amplitude=0.5, duration=30.0)  
compare_times_cpu('test_signal.wav', block_size=256, offset=255, threshold=100000, num_cores=8)
```

Original function time: 0.0502 seconds
Parallel function time: 3.0251 seconds
Speedup: 0.02x