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Apple M1 macOS 11.0.1 Big Sur Benchmarks

Mac benchmarks for a future article.

Automated Executive Summary

Core i7-8700B Mac Mini had the most wins, coming in first place for 44% of the tests.

Based on the geometric mean of all complete results, the fastest (M1 Mac Mini macOS 11.0.1) was 1.28x the speed of the slowest (M1 Mac Mini - Rosetta). M1 Mac Mini was 0.999x the speed of M1 Mac Mini macOS 11.0.1, Core i7-8700B Mac Mini was 0.926x the speed of M1 Mac Mini, M1 Mac Mini - Rosetta was 0.845x the speed of Core i7-8700B Mac Mini.

The results with the greatest spread from best to worst included:

Java 2D Microbenchmark (Rendering Test: Vector Graphics Rendering) at 5.926x
Geekbench (Test: GPU Apple Metal) at 4.406x
IndigoBench (Acceleration: OpenCL GPU - Scene: Supercar) at 4.059x
SMHasher (Hash: wyhash) at 3.639x
Java 2D Microbenchmark (Rendering Test: Image Rendering) at 3.619x
IndigoBench (Acceleration: OpenCL GPU - Scene: Bedroom) at 3.523x
FLAC Audio Encoding (WAV To FLAC) at 3.225x
Timed MAFFT Alignment (Multiple Sequence Alignment - LSU RNA) at 3.048x

LevelDB (Benchmark: Seek Random) at 3.017x
Intel Open Image Denoise (Scene: Memorial) at 2.978x.

Test Systems:

Core i7-8700B Mac Mini

Processor: Intel Core i7-8700B @ 3.20GHz (6 Cores / 12 Threads), Motherboard: Apple Mac mini, Memory: 2 x 4 GB DDR4-2667MHz, Disk: 234GB, Graphics: Intel UHD 630 2GB, Monitor: ASUS VP28U

OS: macOS 11.0.1, Kernel: 20.1.0 (x86_64), OpenCL: OpenCL 1.2 (Oct 29 2020 19:50:08), Compiler: GCC 4.2.1 + Clang 11.0.0, File-System: APFS, Screen Resolution: 3840x2160

Environment Notes: XPC_FLAGS=0x0
Processor Notes: CPU Microcode: 214
Java Notes: Please visit java for information on installing Java.
Python Notes: Python 2.7.16 + Python 3.8.3

M1 Mac Mini - Rosetta

Processor: VirtualApple @ 2.40GHz (8 Cores), Motherboard: Apple Mac mini, Memory: 8GB, Disk: 229GB, Graphics: Apple M1, Monitor: ASUS VP28U

OS: macOS 11.0, Kernel: 20.1.0 (x86_64), OpenCL: OpenCL 1.2 (Oct 18 2020 13:43:44), Compiler: GCC 12.0.0 + Clang 12.0.0 + Xcode 12.2, File-System: APFS, Screen Resolution: 3840x2160

Environment Notes: XPC_FLAGS=0x0
Java Notes: OpenJDK Runtime Environment (build 15.0.1+9-18)
Python Notes: Python 2.7.16 + Python 3.9.0

M1 Mac Mini

Processor: Apple M1 (8 Cores), Motherboard: Apple Mac mini, Memory: 8GB, Disk: 229GB, Graphics: Apple M1, Monitor: ASUS VP28U

OS: macOS 11.0, Kernel: 20.1.0 (arm64), OpenCL: OpenCL 1.2 (Oct 18 2020 13:43:44), Compiler: GCC 12.0.0 + Clang 12.0.0 + Xcode 12.2, File-System: APFS, Screen Resolution: 3840x2160

Environment Notes: XPC_FLAGS=0x0
Java Notes: OpenJDK Runtime Environment (build 15.0.1+9-18)
Python Notes: Python 2.7.16 + Python 3.9.0

M1 Mac Mini macOS 11.0.1

Processor: Apple M1 (8 Cores), Motherboard: Apple Mac mini, Memory: 8GB, Disk: 229GB, Graphics: Apple M1, Monitor: ASUS VP28U

OS: macOS 11.0.1, Kernel: 20.1.0 (arm64), OpenCL: OpenCL 1.2 (Oct 29 2020 19:50:08), Compiler: GCC 12.0.0 + Clang 12.0.0 + Xcode 12.2, File-System: APFS, Screen Resolution: 3840x2160

Apple M1 macOS 11.0.1 Big Sur Benchmarks

Environment Notes: XPC_FLAGS=0x0
Java Notes: Please visit java for information on installing Java.
Python Notes: Python 2.7.16 + Python 3.9.0

	Core i7-8700B Mac Mini	M1 Mac Mini - Rosetta	M1 Mac Mini	M1 Mac Mini macOS 11.0.1
OSPray - San Miguel - SciVis (FPS)	**10.17**	**4.75**		**4.75**
Normalized	100%	46.71%		46.71%
Standard Deviation	1.2%	0.7%		0.3%
OSPray - NASA Streamlines - SciVis (FPS)	**12.77**	**7.15**		7.16
Normalized	100%	55.99%		56.07%
Standard Deviation	0.7%	0.3%		0.4%
OSPray - M.R - SciVis (FPS)	**10.31**	3.87		**3.86**
Normalized	100%	37.54%		37.44%
Standard Deviation	1%	0.4%		0.2%
OSPray - NASA Streamlines - Path Tracer (FPS)	**2.65**	1.56		**1.55**
Normalized	100%	58.87%		58.49%
Standard Deviation	0.3%	0.4%		0.3%
NeatBench - All (FPS)	**10.2**	**10.2**		**10.3**
Normalized	99.03%	99.03%		100%
Standard Deviation	0.7%	0.6%		0%
NeatBench - CPU (FPS)	10.13	**10.1**		**10.2**
Normalized	99.31%	99.02%		100%
Standard Deviation	3.6%	0.6%		0.6%
ParaView - Many Spheres - 1920 x 1080 (Frames / Sec)	**5.32**	5.81		**6.38**
Normalized	83.39%	91.07%		100%
Standard Deviation	0.8%	0.2%		0.5%
Kvazaar - Bosphorus 1080p - Medium (FPS)	**13.68**	**4.61**	5.51	
Normalized	100%	33.7%	40.28%	
Standard Deviation	0.9%	0%	0%	
Kvazaar - Bosphorus 4K - Very Fast (FPS)	**8.61**	**3.08**	3.67	
Normalized	100%	35.77%	42.62%	
Standard Deviation	0.6%	0%	0%	
Kvazaar - Bosphorus 4K - Ultra Fast (FPS)	**15.81**	**6.76**	7.03	
Normalized	100%	42.76%	44.47%	
Standard Deviation	1%	0.1%	0.1%	
Kvazaar - Bosphorus 1080p - Very Fast (FPS)	**34.70**	**12.75**	15.03	
Normalized	100%	36.74%	43.31%	
Standard Deviation	0.6%	0.1%	0.5%	
Kvazaar - Bosphorus 1080p - Ultra Fast (FPS)	**65.14**	**27.10**	28.18	
Normalized	100%	41.6%	43.26%	
Standard Deviation	1.3%	0.1%	0.1%	

Apple M1 macOS 11.0.1 Big Sur Benchmarks

Embree - Pathtracer - Crown (FPS)	**6.7317**	**3.7754**		3.7791
Normalized	100%	56.08%		56.14%
Standard Deviation	0.2%	0.1%		0.1%
Embree - Pathtracer ISPC - Crown (FPS)	**7.5665**	**3.8613**		3.8630
Normalized	100%	51.03%		51.05%
Standard Deviation	0.2%	0.1%		0.1%
Embree - Pathtracer - Asian Dragon (FPS)	**7.9907**	**4.4010**		4.4066
Normalized	100%	55.08%		55.15%
Standard Deviation	0.3%	0%		0.1%
Embree - Pathtracer ISPC - Asian Dragon (FPS)	**9.0500**	**4.7773**		4.7818
Normalized	100%	52.79%		52.84%
Standard Deviation	0.1%	0.1%		0%
Intel Open Image Denoise - Memorial (Images / Sec)	**5.36**	**1.80**		**1.80**
Normalized	100%	33.58%		33.58%
Standard Deviation	0.5%	0.2%		0.1%
GraphicsMagick - Rotate	**794**	**1040**		
Normalized	76.35%	100%		
Standard Deviation		0.2%		
GraphicsMagick - Sharpen (Iterations/min)	**16**	**19**		
Normalized	84.21%	100%		
GraphicsMagick - Enhanced (Iterations/min)	**24**	**31**		
Normalized	77.42%	100%		
GraphicsMagick - Resizing (Iterations/min)	**116**	**153**		
Normalized	75.82%	100%		
Standard Deviation		0.4%		
GraphicsMagick - HWB Color Space (Iterations/min)	**176**	**224**		
Normalized	78.57%	100%		
Standard Deviation		0.3%		
Fhourstones - C.C.4.S (Kpos / sec)	**14006**	16469	20672	**20733**
Normalized	67.55%	79.43%	99.71%	100%
Standard Deviation	0.1%	0%	0%	0%
Chaos Group V-RAY - CPU	**9211**	**7384**		**7384**
Normalized	100%	80.17%		80.17%
Standard Deviation	0.4%	0.5%		0.6%
IndigoBench - CPU - Bedroom (M samples/s)	**1.163**	**0.881**		0.889
Normalized	100%	75.75%		76.44%
Standard Deviation	1.8%	0.2%		0.4%
IndigoBench - CPU - Supercar (M samples/s)	**2.823**	**1.988**		2.009
Normalized	100%	70.42%		71.17%
Standard Deviation	0.5%	1.4%		1.3%
IndigoBench - OpenCL GPU - Bedroom (M samples/s)	**0.566**	**1.994**		1.975
Normalized	28.39%	100%		99.05%

Apple M1 macOS 11.0.1 Big Sur Benchmarks

Standard Deviation	0.2%	1.5%		1.8%
IndigoBench - OpenCL GPU - Supercar (M samples/s)	**1.448**	**5.878**		5.789
Normalized	24.63%	100%		98.49%
Standard Deviation	0%	2.8%		3%
LuxCoreRender - DLSC (M	**1.26**	**0.90**		**0.90**
Normalized	100%	71.43%		71.43%
Standard Deviation	2.2%	3.5%		2.9%
LuxCoreRender - R.C.a.P (M samples/sec)	**1.21**	0.90		**0.87**
Normalized	100%	74.38%		71.9%
Standard Deviation	2.5%	2.3%		2.4%
Zstd Compression - 3 (MB/s)	**1671**	**4544**		
Normalized	36.76%	100%		
Standard Deviation	0.4%	18.5%		
Zstd Compression - 19 (MB/s)	**15.6**	**24.9**		
Normalized	62.65%	100%		
Standard Deviation	0.4%	0.2%		
LevelDB - Overwrite (MB/s)	**13.6**	**16.6**		
Normalized	81.93%	100%		
Standard Deviation	0.3%	1%		
LevelDB - Rand Fill (MB/s)	**13.5**	**16.5**		
Normalized	81.82%	100%		
Standard Deviation	0.7%	1.5%		
LevelDB - Seq Fill (MB/s)	**15.4**	**18.8**		
Normalized	81.91%	100%		
Standard Deviation	0%	0.6%		
libjpeg-turbo tjbench - D.T (Megapixels/sec)	**209.639621**	**148.845598**		
Normalized	100%	71%		
Standard Deviation	0.3%	0.2%		
SciMark - Composite (Mflops)	**764.47**	**557.75**	579.07	579.94
Normalized	100%	72.96%	75.75%	75.86%
Standard Deviation	0.7%	0.4%	0%	0.1%
SciMark - F.F.T (Mflops)	**245.92**	346.52	397.21	**401.65**
Normalized	61.23%	86.27%	98.89%	100%
Standard Deviation	1%	0.2%	0.3%	0.3%
SciMark - S.M.M (Mflops)	**832.84**	**512.06**	575.17	575.03
Normalized	100%	61.48%	69.06%	69.04%
Standard Deviation	1.6%	2.3%	0%	0.1%
Java SciMark - Composite (Mflops)	**2458**	**2591**		
Normalized	94.88%	100%		
Standard Deviation	1.1%	3%		
Botan - AES-256 (MiB/s)	**4065**	**4833**		
Normalized	84.1%	100%		
Standard Deviation	0.1%	3.1%		
Botan - Twofish (MiB/s)	**327.496**	**291.511**		
Normalized	100%	89.01%		
Standard Deviation	0.3%	0%		
Botan - Blowfish (MiB/s)	**416.676**	**368.370**		
Normalized	100%	88.41%		
Standard Deviation	0.1%	0%		
SMHasher - wyhash (MiB/sec)	**18264**	**66462**		
Normalized	27.48%	100%		
Standard Deviation	1.6%	0.1%		

Apple M1 macOS 11.0.1 Big Sur Benchmarks

SMHasher - MeowHash (MiB/sec)	**42359**	**107910**		
Normalized	39.25%	100%		
Standard Deviation	0.3%	0.1%		
SMHasher - Spooky32 (MiB/sec)	**17008**	**33009**		
Normalized	51.53%	100%		
Standard Deviation	0.3%	0.1%		
SMHasher - fasthash32 (MiB/sec)	**7718**	**16175**		
Normalized	47.71%	100%		
Standard Deviation	0.1%	0.1%		
SMHasher - t1ha2_atonce (MiB/sec)	**16102**	**44137**		
Normalized	36.48%	100%		
Standard Deviation	0.9%	0%		
Crypto++ - Keyed Algorithms (MiB/s)	**641.469218**	**438.559991**		
Normalized	100%	68.37%		
Standard Deviation	0.1%	0.1%		
Crypto++ - Unkeyed Algorithms	**292.152864**	**302.259103**		
Normalized	96.66%	100%		
Standard Deviation	0.2%	0.3%		
Crypto++ - I.E.C.P.K.A (MiB/s)	**3863**	**3315**		
Normalized	100%	85.83%		
Standard Deviation	0.1%	0.3%		
ParaView - Many Spheres - 1920 x 1080 (MiPolys / Sec)	**532.720**	582.510		**639.520**
Normalized	83.3%	91.09%		100%
Standard Deviation	0.8%	0.2%		0.5%
7-Zip Compression - C.S.T (MIPS)	34269	**31892**	41836	**41856**
Normalized	81.87%	76.19%	99.95%	100%
Standard Deviation	0.7%	0.5%	0.3%	0.2%
LibRaw - P.P.B (Mpix/sec)	**10.39**	10.73		**10.75**
Normalized	96.65%	99.81%		100%
Standard Deviation	0.1%	0%		0%
Stockfish - Total Time (Nodes/s)	**16975458**	**15319002**		
Normalized	100%	90.24%		
Standard Deviation	2.4%	0.7%		
Selenium - Basemark - Firefox (Overall Score)	**518.96**		**721.95**	
Normalized	71.88%		100%	
Standard Deviation	2.8%		7.5%	
Selenium - Basemark - Google Chrome (Overall Score)	**506.26**		**747.72**	
Normalized	67.71%		100%	
Standard Deviation	2.9%		2.8%	
Hierarchical INTegration - FLOAT (QUIPs)	**440061970**	**554583836**		
Normalized	79.35%	100%		
Standard Deviation	0.4%	0.1%		
Selenium - StyleBench - Firefox (Runs / Minute)	**98.51**		**87.7**	
Normalized	100%		89.03%	
Standard Deviation	0.1%		0.6%	
Selenium - StyleBench - Google Chrome (Runs / Minute)	**98.6**		**87.4**	
Normalized	100%		88.64%	
Standard Deviation	0.8%		0.7%	

Apple M1 macOS 11.0.1 Big Sur Benchmarks

Selenium - Speedometer - Firefox (Runs/min)	103		100.6	
Normalized	100%		97.67%	
Standard Deviation	2.5%		2.6%	
Selenium - Speedometer - Google Chrome (Runs/min)	102		102	
Standard Deviation	2%			
PHPBench - P.B.S (Score)	557663	420420	594928	596325
Normalized	93.52%	70.5%	99.77%	100%
Standard Deviation	0.3%	0.9%	0.1%	0.3%
Selenium - CanvasMark - Firefox	11581		13965	
Normalized	82.93%		100%	
Standard Deviation	2%		1.3%	
Selenium - WebXPRT - Google Chrome (Score)	255		199	
Normalized	100%		78.04%	
Standard Deviation	1%			
Selenium - CanvasMark - Google Chrome (Score)	11719		13783	
Normalized	85.03%		100%	
Standard Deviation	1.4%		2.5%	
Geekbench - CPU Multi Core (Score)	5360		5923	5981
Normalized	89.62%		99.03%	100%
Standard Deviation	1.3%		0.8%	0.1%
Geekbench - CPU Single Core (Score)	1229		1329	1324
Normalized	92.48%		100%	99.62%
Standard Deviation	0.2%		1.5%	1.7%
Geekbench - GPU Apple Metal (Score)	4919		21626	21675
Normalized	22.69%		99.77%	100%
Standard Deviation	0.1%		0.1%	0%
Java 2D Microbenchmark - Text Rendering (Units/sec)	14963	18139		
Normalized	82.49%	100%		
Standard Deviation	0.3%	0.9%		
Java 2D Microbenchmark - Image Rendering (Units/sec)	1828473	6616497		
Normalized	27.64%	100%		
Standard Deviation	0%	1.2%		
Java 2D Microbenchmark - V.G.R (Units/sec)	1129615	6694455		
Normalized	16.87%	100%		
Standard Deviation	0.1%	0.2%		
BRL-CAD - V.P.M (VGR Performance Metric)	73448	69930		
Normalized	100%	95.21%		
SMHasher - wyhash (cycles/hash)	23.018	11.586		
Normalized	50.33%	100%		
Standard Deviation	0.2%	0%		
SMHasher - MeowHash (cycles/hash)	50.619	24.502		
Normalized	48.4%	100%		
Standard Deviation	0.2%	0%		
SMHasher - Spooky32 (cycles/hash)	39.709	23.494		
Normalized	59.17%	100%		
Standard Deviation	0.2%	0.1%		

Apple M1 macOS 11.0.1 Big Sur Benchmarks

SMHasher - fasthash32 (cycles/hash)	**31.854**	**15.503**		
Normalized	48.67%	100%		
Standard Deviation	0.3%	0%		
SMHasher - t1ha2_atonce	**31.220**	**15.406**		
Normalized	49.35%	100%		
Standard Deviation	0.1%	0.1%		
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	**2.86005**	**3.55882**		3.55789
Normalized	100%	80.37%		80.39%
Standard Deviation	0.3%	0.1%		0.2%
WebP Image Encode - Quality 100 (Encode Time - sec)	**2.313**	2.804		**2.816**
Normalized	100%	82.49%		82.14%
Standard Deviation	0.3%	0.1%		0.5%
WebP Image Encode - Q.1.L (Encode Time - sec)	**16.264**	**17.273**		17.195
Normalized	100%	94.16%		94.59%
Standard Deviation	0.6%	0.6%		0.4%
WebP Image Encode - Q.1.H.C (Encode Time - sec)	**6.252**	6.836		**6.984**
Normalized	100%	91.46%		89.52%
Standard Deviation	0.9%	0.1%		0.1%
WebP Image Encode - Q.1.L.H.C (Encode Time - sec)	**37.825**	**37.923**		37.901
Normalized	100%	99.74%		99.8%
Standard Deviation	0.1%	0.4%		0.5%
LevelDB - Overwrite (us/Op)	**97.602**	**53.243**		
Normalized	54.55%	100%		
Standard Deviation	0.4%	1.2%		
LevelDB - Rand Fill (us/Op)	**98.083**	**53.400**		
Normalized	54.44%	100%		
Standard Deviation	0.5%	1.5%		
LevelDB - Rand Read (us/Op)	**6.797**	**4.927**		
Normalized	72.49%	100%		
Standard Deviation	1.3%	6.6%		
LevelDB - Seek Rand (us/Op)	**30.317**	**10.050**		
Normalized	33.15%	100%		
Standard Deviation	0.7%	1.7%		
LevelDB - Rand Delete (us/Op)	**58.546**	**30.279**		
Normalized	51.72%	100%		
Standard Deviation	0.2%	0.7%		
LevelDB - Seq Fill (us/Op)	**86.268**	**46.940**		
Normalized	54.41%	100%		
Standard Deviation	0.1%	0.5%		
PyBench - T.F.A.T.T (Milliseconds)	**1293**		1493	**1505**
Normalized	100%		86.6%	85.91%
Standard Deviation	0.1%			1.6%
Renaissance - Savina Reactors.IO	**10596**	**9668**		
Normalized	91.25%	100%		
Standard Deviation	2.8%	6.9%		
Selenium - W.i - Firefox (ms)	**31.8**		**28.7**	
Normalized	90.25%		100%	
Standard Deviation	0.3%		5.9%	
Selenium - W.i - Google Chrome (ms)	**31.8**		**28.2**	

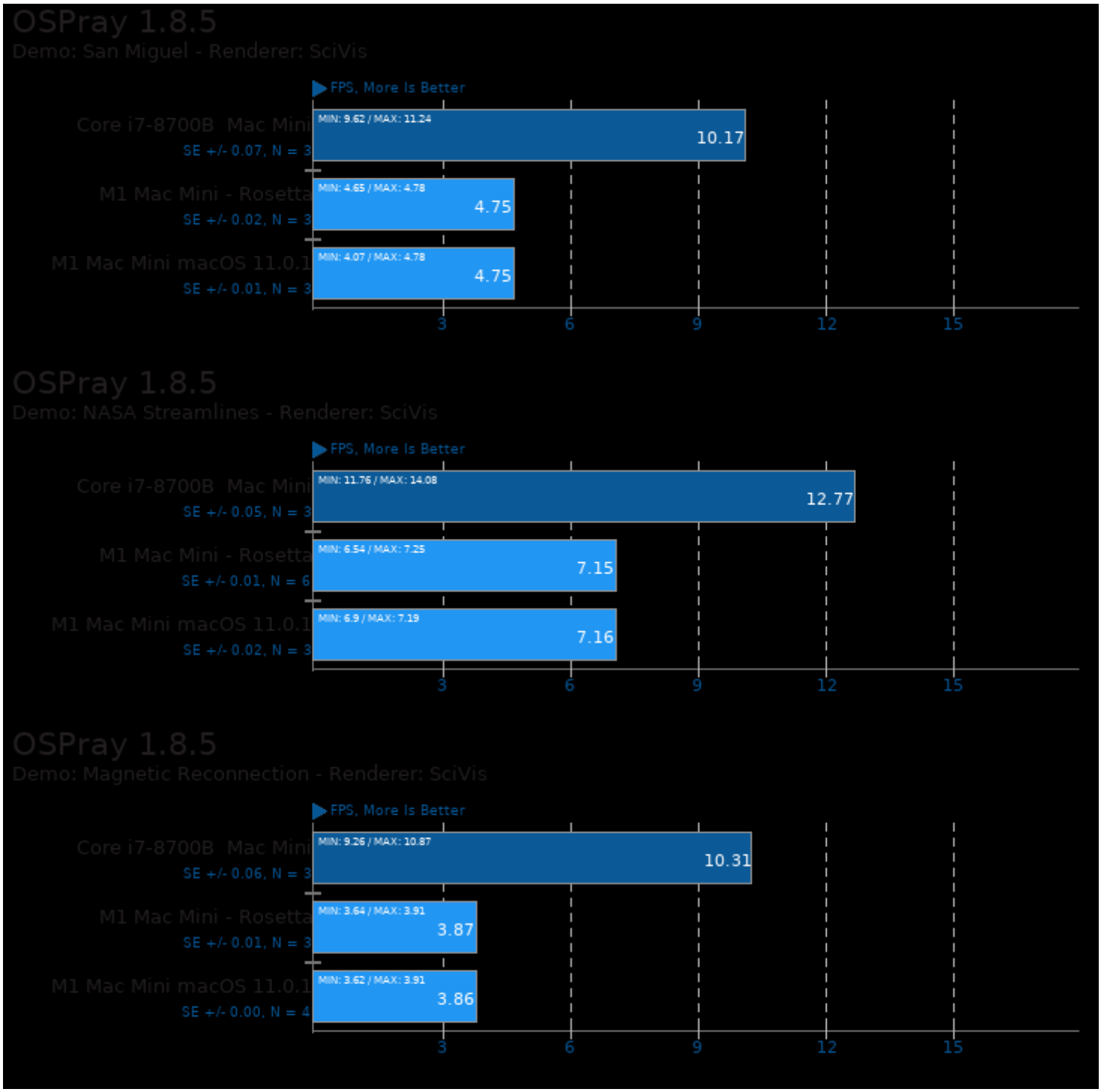
Apple M1 macOS 11.0.1 Big Sur Benchmarks

Normalized	88.68%		100%	
Standard Deviation	0.3%		2.9%	
Timed MAFFT Alignment - M.S.A - LSU RNA (sec)	18.513	**36.242**	**11.891**	11.978
Normalized	64.23%	32.81%	100%	99.27%
Standard Deviation	1%	1.6%	3.7%	3.3%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**77.383**	73.689	50.690	**50.427**
Normalized	65.17%	68.43%	99.48%	100%
Standard Deviation	1%	1.1%	0.8%	0.2%
Appleseed - Emily (sec)	**560.828946**	**752.887524**		750.315364
Normalized	100%	74.49%		74.75%
Appleseed - Disney Material (sec)	**308.506243**	377.988431		**379.869025**
Normalized	100%	81.62%		81.21%
Appleseed - Material Tester (sec)	**308.371451**	**478.937211**		438.426597
Normalized	100%	64.39%		70.34%
Git - T.T.C.C.G.C (sec)	**72.010**	55.440	**46.410**	46.478
Normalized	64.45%	83.71%	100%	99.85%
Standard Deviation	0.2%	0.3%	0.1%	0.2%
Sunflow Rendering System - G.I.I.S (sec)	**1.566**	**2.083**		
Normalized	100%	75.18%		
Standard Deviation	1.6%	3%		
AOBench - 2048 x 2048 - Total Time (sec)	**30.400**		21.533	**21.529**
Normalized	70.82%		99.98%	100%
Standard Deviation	0.2%		0.9%	0.8%
Basis Universal - ETC1S (sec)	**56.462**	**61.481**		
Normalized	100%	91.84%		
Standard Deviation	0.4%	0.2%		
Basis Universal - UASTC Level 0 (sec)	**9.039**	**9.143**		
Normalized	100%	98.86%		
Standard Deviation	0.4%	0.3%		
Basis Universal - UASTC Level 2 (sec)	**49.531**	**54.174**		
Normalized	100%	91.43%		
Standard Deviation	0.6%	0.1%		
Basis Universal - UASTC Level 3 (sec)	**92.103**	**104.475**		
Normalized	100%	88.16%		
Standard Deviation	0.7%	0.1%		
C-Ray - Total Time - 4.1.R.P.P (sec)	154.246	**252.397**	**137.221**	137.222
Normalized	88.96%	54.37%	100%	100%
Standard Deviation	0.2%	0%	0%	0%
XZ Compression - C.u.1.0.3.s.i.i.C.L.9 (sec)	50.813	**58.111**	49.304	**49.291**
Normalized	97%	84.82%	99.97%	100%
Standard Deviation	0.1%	0.8%	0.6%	0.5%
FLAC Audio Encoding - WAV To FLAC (sec)	**8.777**	12.629	**28.309**	28.281
Normalized	100%	69.5%	31%	31.03%
Standard Deviation	0.2%	1.9%	0.8%	0.6%
GEGL - Crop (sec)	**8.280**	**9.194**		8.917
Normalized	100%	90.06%		92.86%
Standard Deviation	1.7%	14.9%		2.7%
GEGL - Scale (sec)	**5.036**	**5.849**		5.772

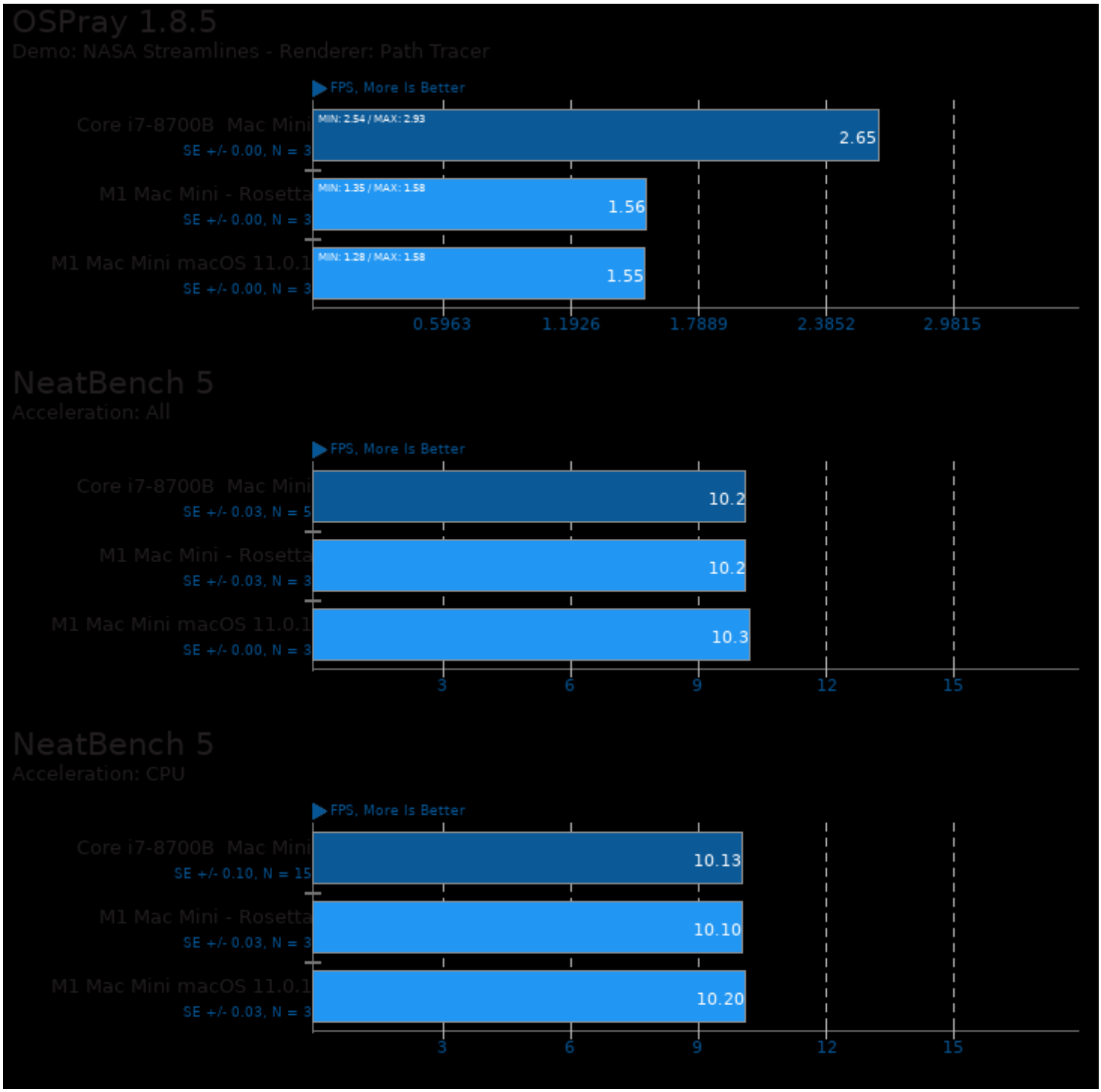
Apple M1 macOS 11.0.1 Big Sur Benchmarks

Normalized	100%	86.1%		87.25%
Standard Deviation	0.3%	0.3%		0.4%
GEGL - Reflect (sec)	**31.597**	**31.706**		31.637
Normalized	100%	99.66%		99.87%
Standard Deviation	0.1%	0%		0%
GEGL - Color Enhance (sec)	**48.521**	47.632		**47.378**
Normalized	97.64%	99.47%		100%
Standard Deviation	0.3%	0.3%		0.1%
Timed HMMer Search - P.D.S (sec)	**106.909**	**117.030**		
Normalized	100%	91.35%		
Standard Deviation	1.9%	0.3%		
Primesieve - 1.P.N.G (sec)	**37.475**	**33.938**		
Normalized	90.56%	100%		
Standard Deviation	0.9%	0.9%		
Tachyon - Total Time (sec)	149.8490	**179.7149**	**118.0699**	118.094
Normalized	78.79%	65.7%	100%	99.98%
Standard Deviation	0.6%	0.9%	0.2%	0.1%
Darktable - Boat - CPU-only (sec)	**22.914**	10.335		**10.329**
Normalized	45.08%	99.94%		100%
Standard Deviation	3.8%	0.4%		0.4%
Darktable - Masskrug - CPU-only (sec)	**8.071**	7.188		**7.060**
Normalized	87.47%	98.22%		100%
Standard Deviation	9.2%	0.9%		0.8%
Darktable - Server Room - CPU-only (sec)	**7.147**	**5.704**		5.718
Normalized	79.81%	100%		99.76%
Standard Deviation	0.5%	0.7%		0.2%

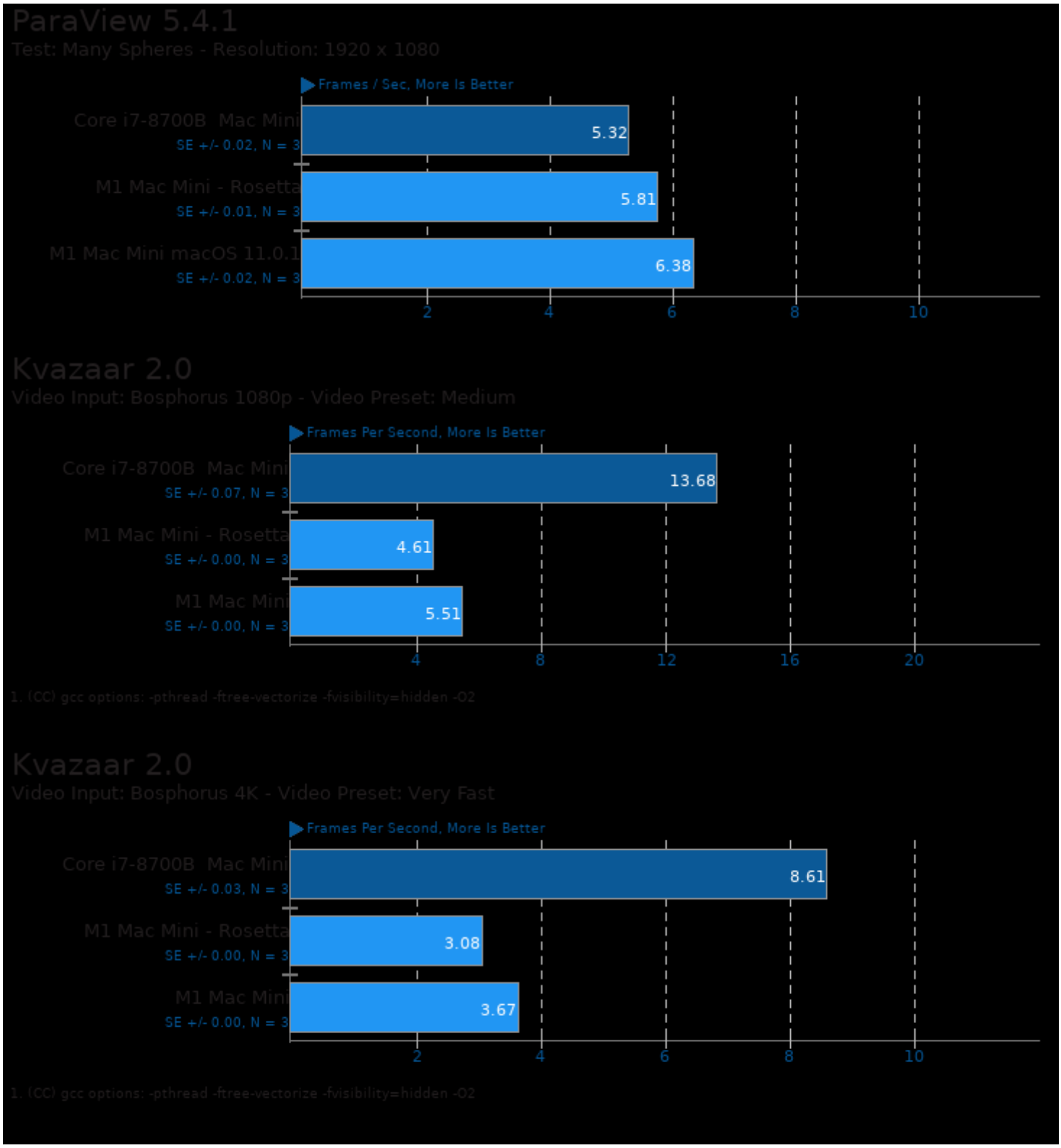
Apple M1 macOS 11.0.1 Big Sur Benchmarks

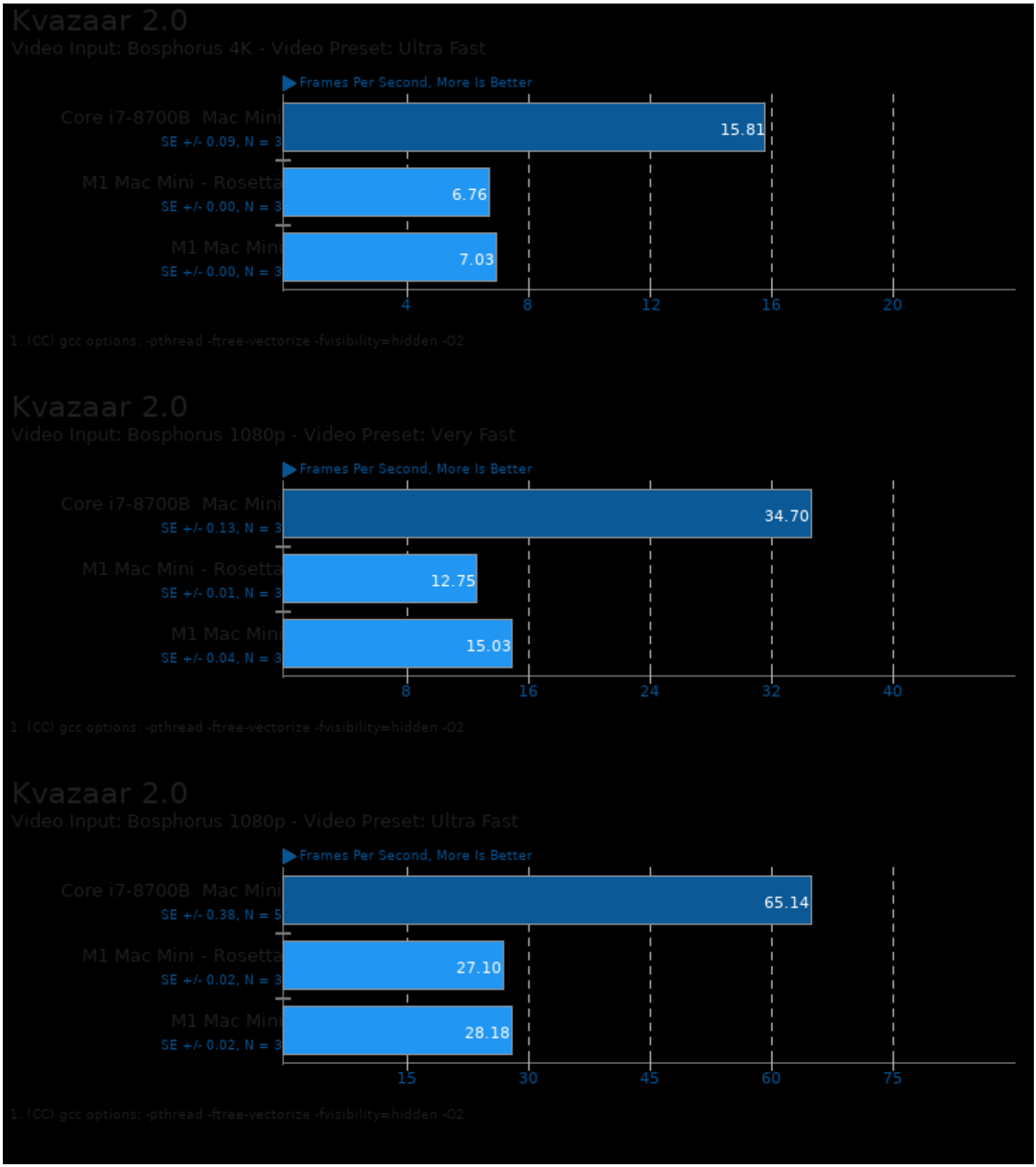


Apple M1 macOS 11.0.1 Big Sur Benchmarks

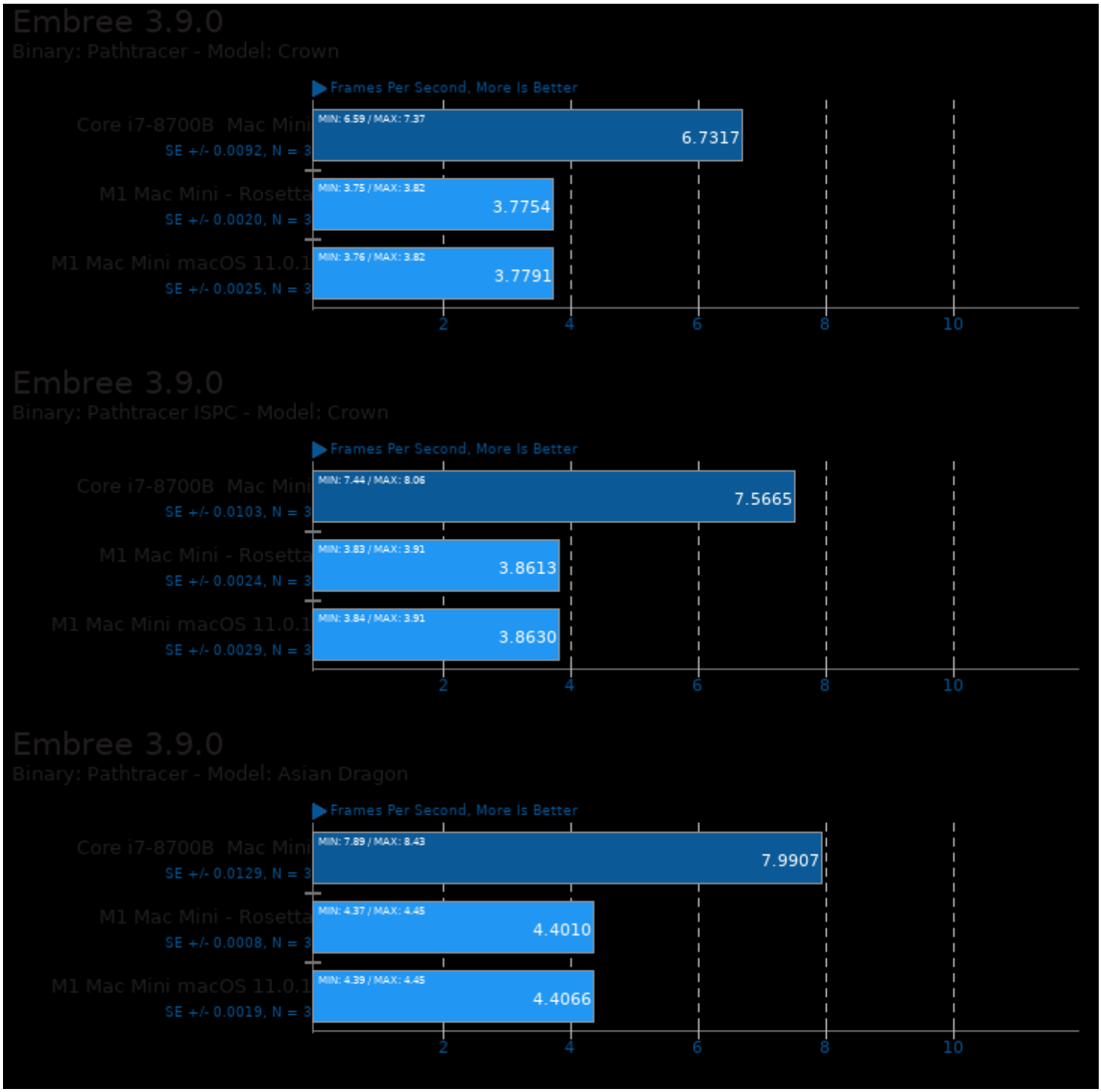


Apple M1 macOS 11.0.1 Big Sur Benchmarks

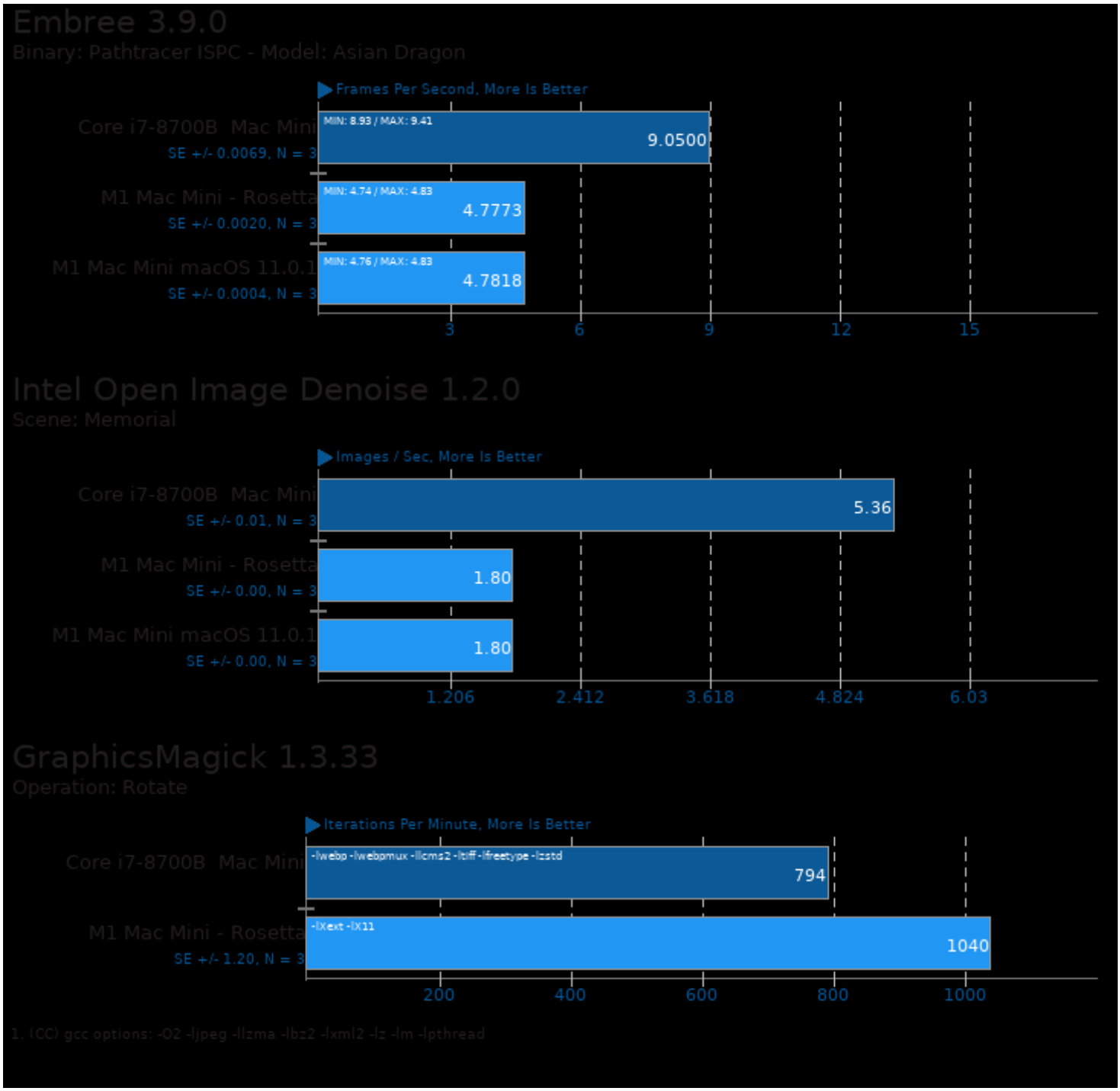


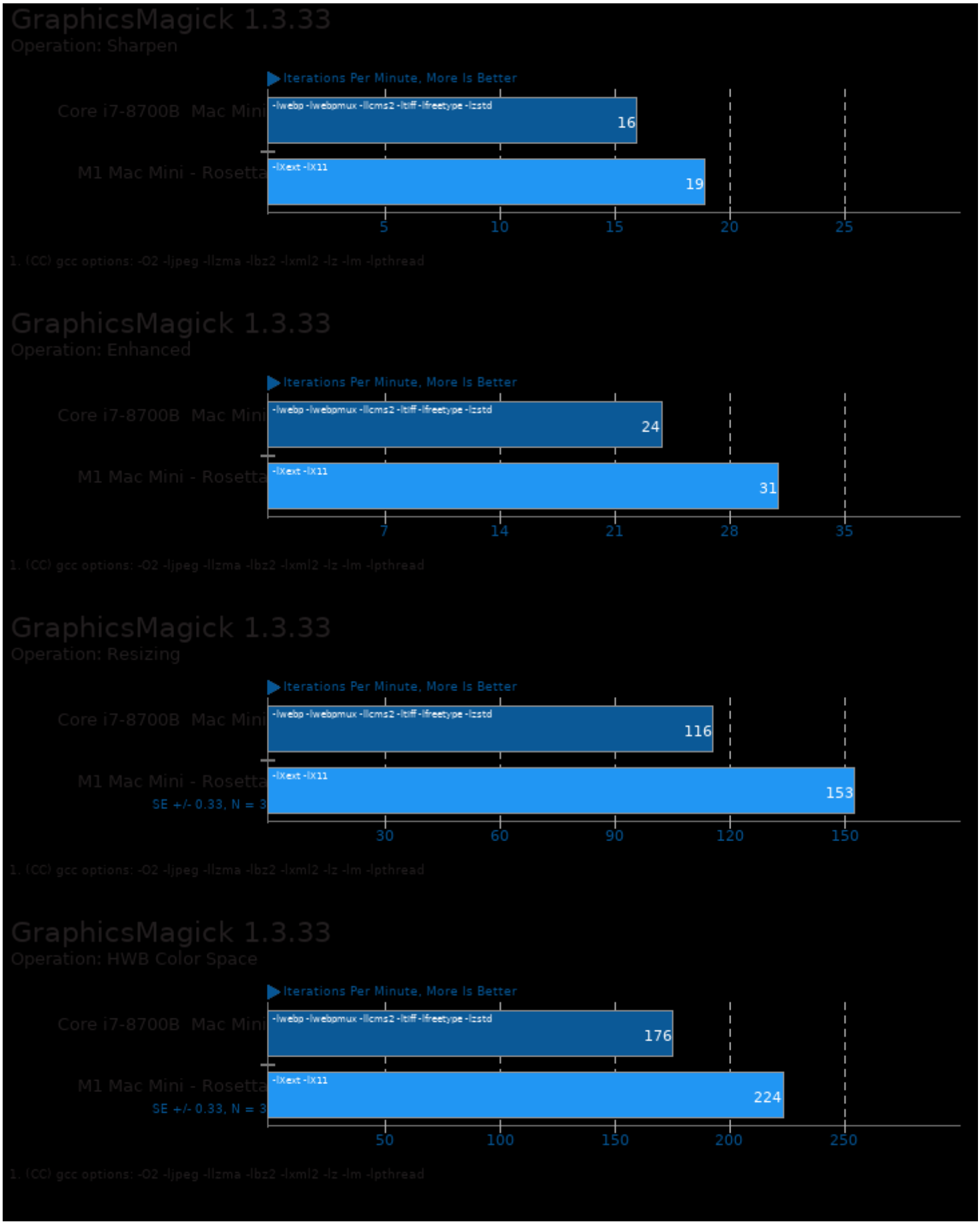

Kvazaar 2.0
Video Input: Bosphorus 4K - Video Preset: Ultra Fast
Frames Per Second, More Is Better
Core i7-8700B Mac Mini
SE +/- 0.09, N = 3
15.81
M1 Mac Mini - Rosetta
SE +/- 0.00, N = 3
6.76
M1 Mac Mini
SE +/- 0.00, N = 3
7.03
4
8
12
16
20
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2
Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Very Fast
Frames Per Second, More Is Better
Core i7-8700B Mac Mini
SE +/- 0.13, N = 3
34.70
M1 Mac Mini - Rosetta
SE +/- 0.01, N = 3
12.75
M1 Mac Mini
SE +/- 0.04, N = 3
15.03
8
16
24
32
40
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2
Kvazaar 2.0
Video Input: Bosphorus 1080p - Video Preset: Ultra Fast
Frames Per Second, More Is Better
Core i7-8700B Mac Mini
SE +/- 0.38, N = 5
65.14
M1 Mac Mini - Rosetta
SE +/- 0.02, N = 3
27.10
M1 Mac Mini
SE +/- 0.02, N = 3
28.18
15
30
45
60
75
1. (CC) gcc options: -pthread -ftree-vectorize -fvisibility=hidden -O2

Apple M1 macOS 11.0.1 Big Sur Benchmarks

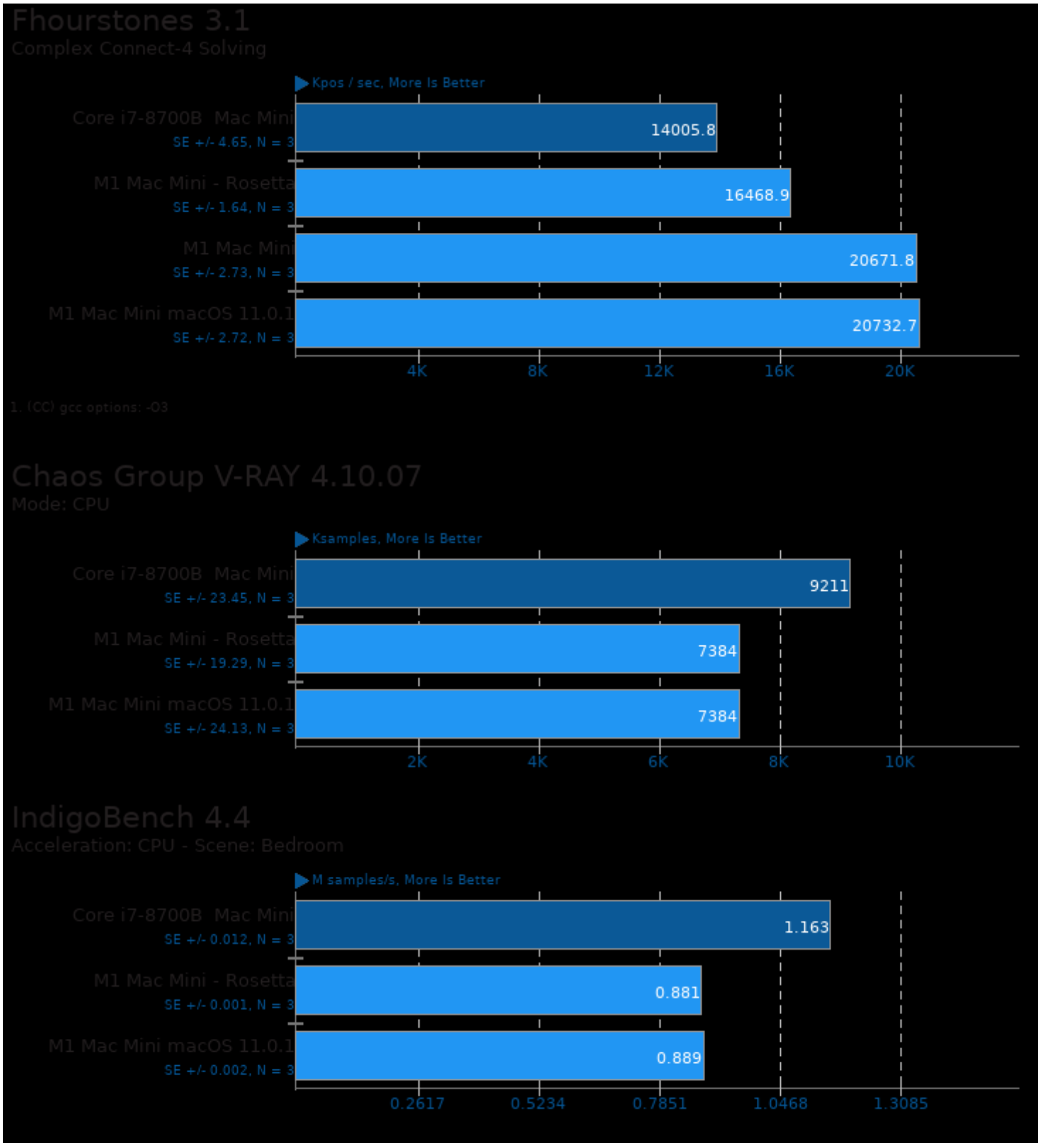


Apple M1 macOS 11.0.1 Big Sur Benchmarks

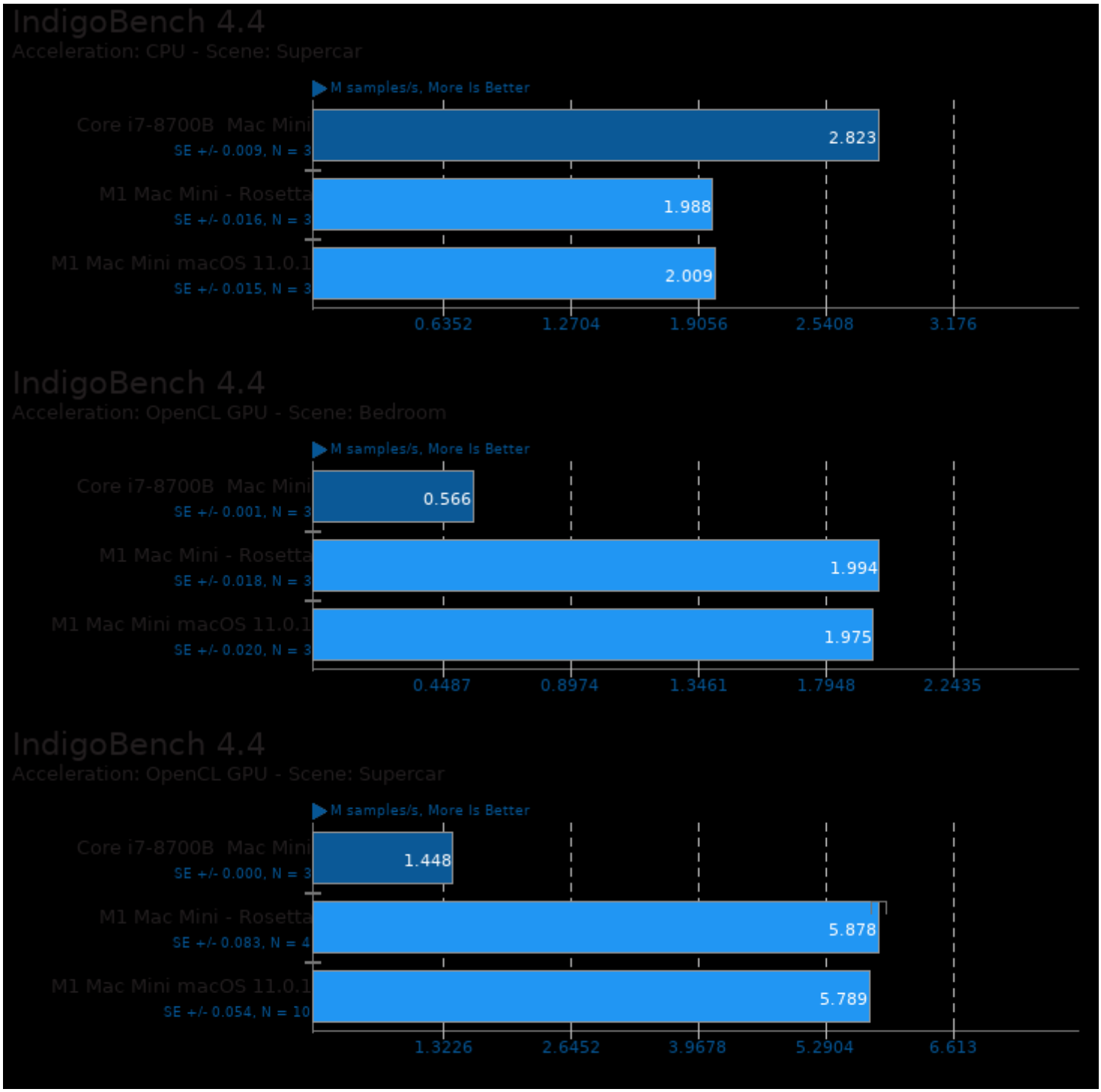



GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute, More Is Better
Core i7-8700B Mac Mini
-lwebp -lwebpmux -llcms2 -ltiff -lfreetype -lzstd
16
M1 Mac Mini - Rosetta
-lXext -lX11
19
5
10
15
20
25
1. (CC) gcc options: -O2 -ljpeg -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Enhanced
Iterations Per Minute, More Is Better
Core i7-8700B Mac Mini
-lwebp -lwebpmux -llcms2 -ltiff -lfreetype -lzstd
24
M1 Mac Mini - Rosetta
-lXext -lX11
31
7
14
21
28
35
1. (CC) gcc options: -O2 -ljpeg -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Resizing
Iterations Per Minute, More Is Better
Core i7-8700B Mac Mini
-lwebp -lwebpmux -llcms2 -ltiff -lfreetype -lzstd
116
M1 Mac Mini - Rosetta
-lXext -lX11
153
SE +/- 0.33, N = 3
30
60
90
120
150
1. (CC) gcc options: -O2 -ljpeg -llzma -lbz2 -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: HWB Color Space
Iterations Per Minute, More Is Better
Core i7-8700B Mac Mini
-lwebp -lwebpmux -llcms2 -ltiff -lfreetype -lzstd
176
M1 Mac Mini - Rosetta
-lXext -lX11
224
SE +/- 0.33, N = 3
50
100
150
200
250
1. (CC) gcc options: -O2 -ljpeg -llzma -lbz2 -lxml2 -lz -lm -lpthread

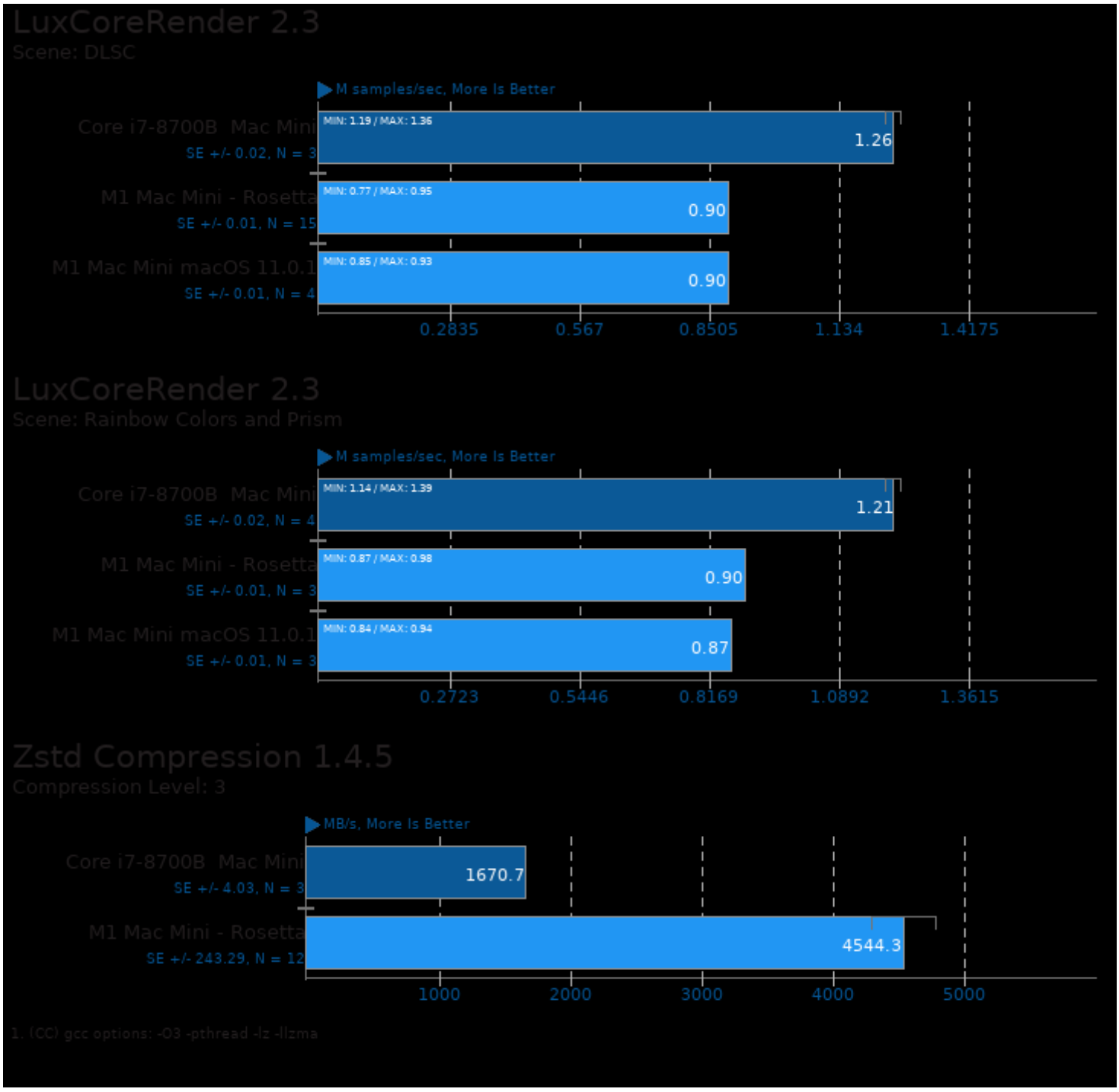
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks



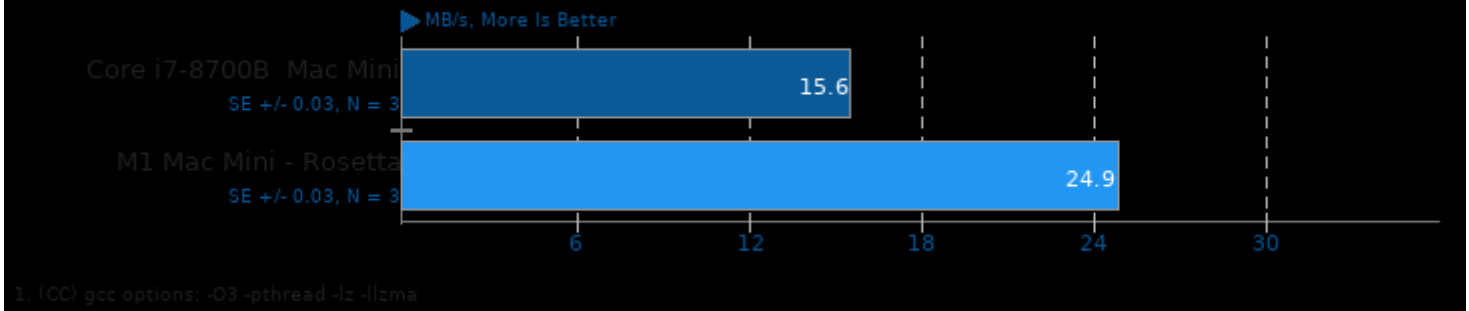
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks

Zstd Compression 1.4.5

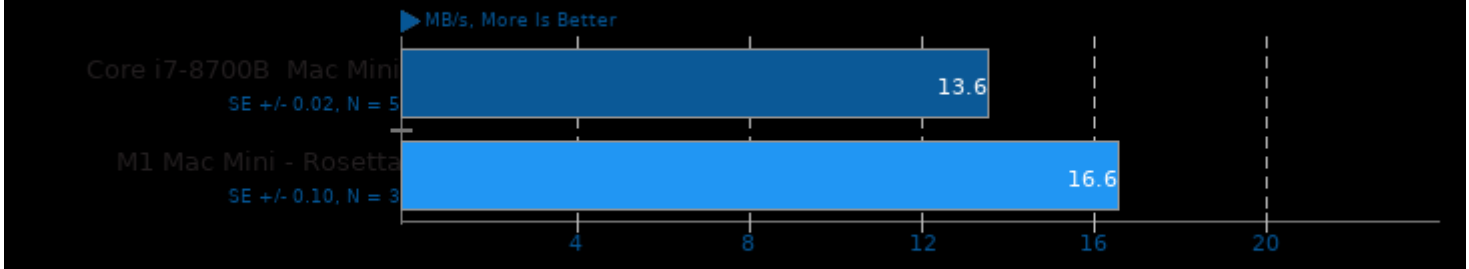
Compression Level: 19



1. (CC) gcc options: -O3 -pthread -lz -llzma

LevelDB 1.22

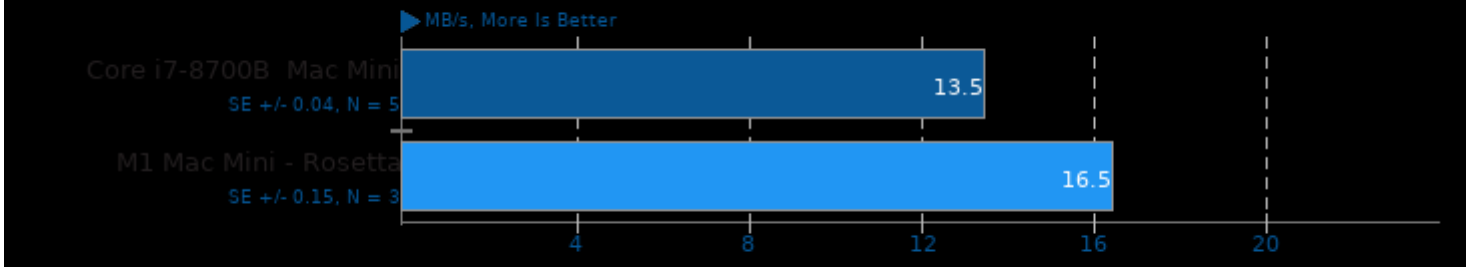
Benchmark: Overwrite



1. (CXX) g++ options: -O3 -isysroot

LevelDB 1.22

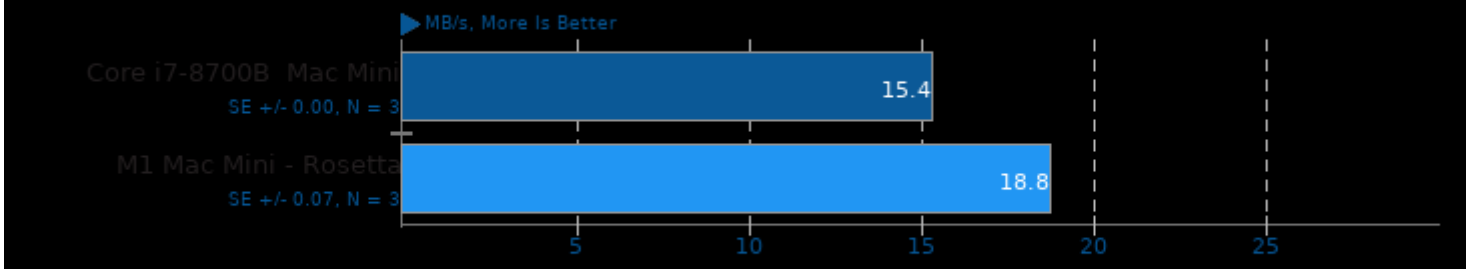
Benchmark: Random Fill



1. (CXX) g++ options: -O3 -isysroot

LevelDB 1.22

Benchmark: Sequential Fill

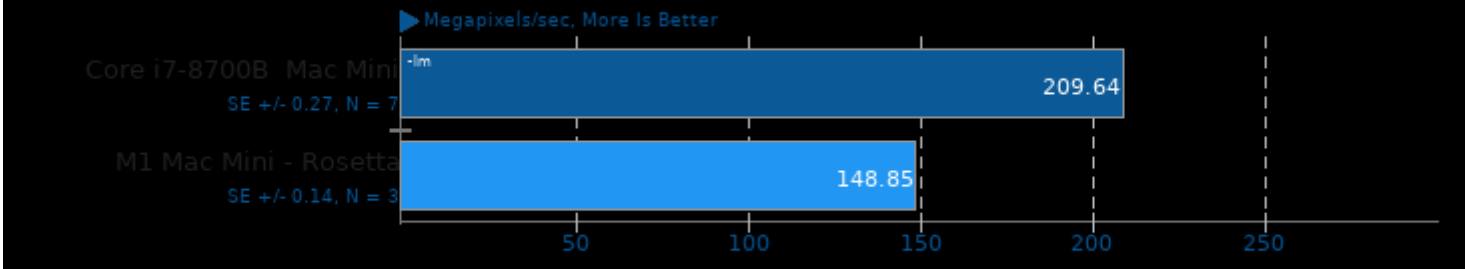


1. (CXX) g++ options: -O3 -isysroot

Apple M1 macOS 11.0.1 Big Sur Benchmarks

libjpeg-turbo tjbench 2.0.2

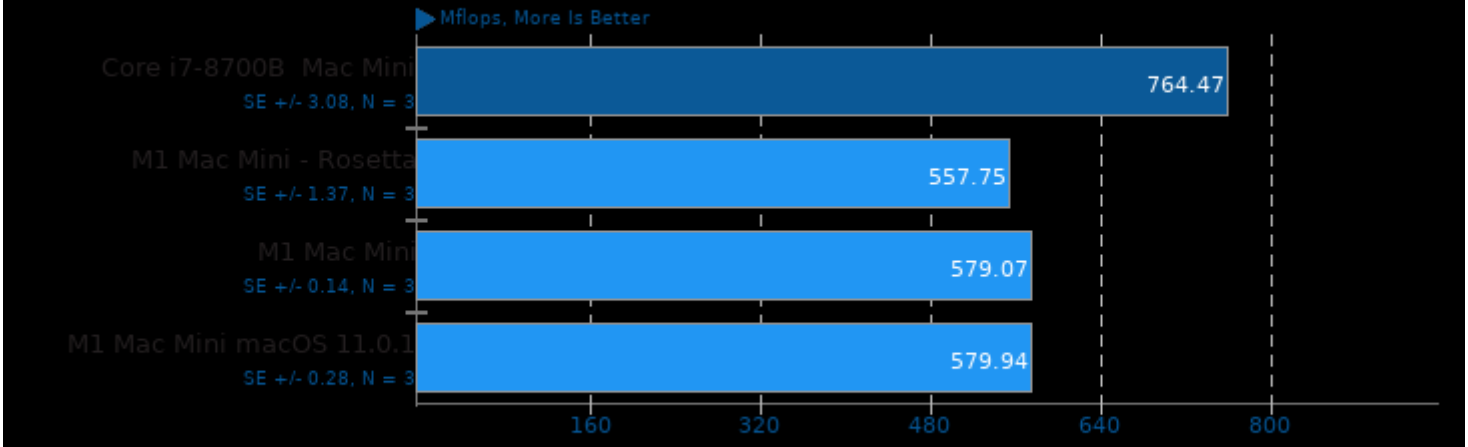
Test: Decompression Throughput



1. (CC) gcc options: -O3 -isysroot

SciMark 2.0

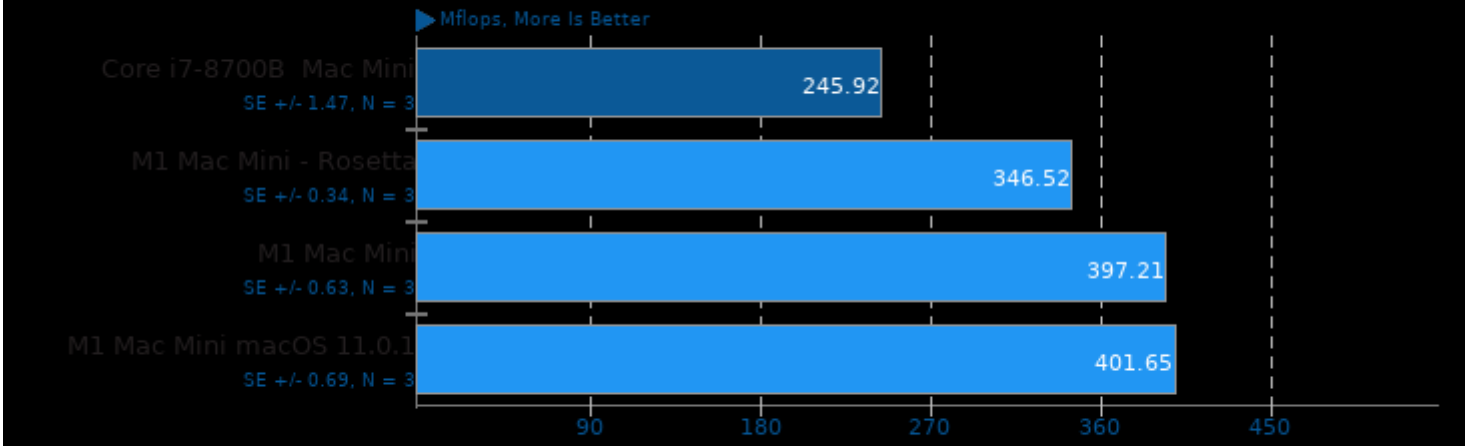
Computational Test: Composite



1. (CC) gcc options: -lm

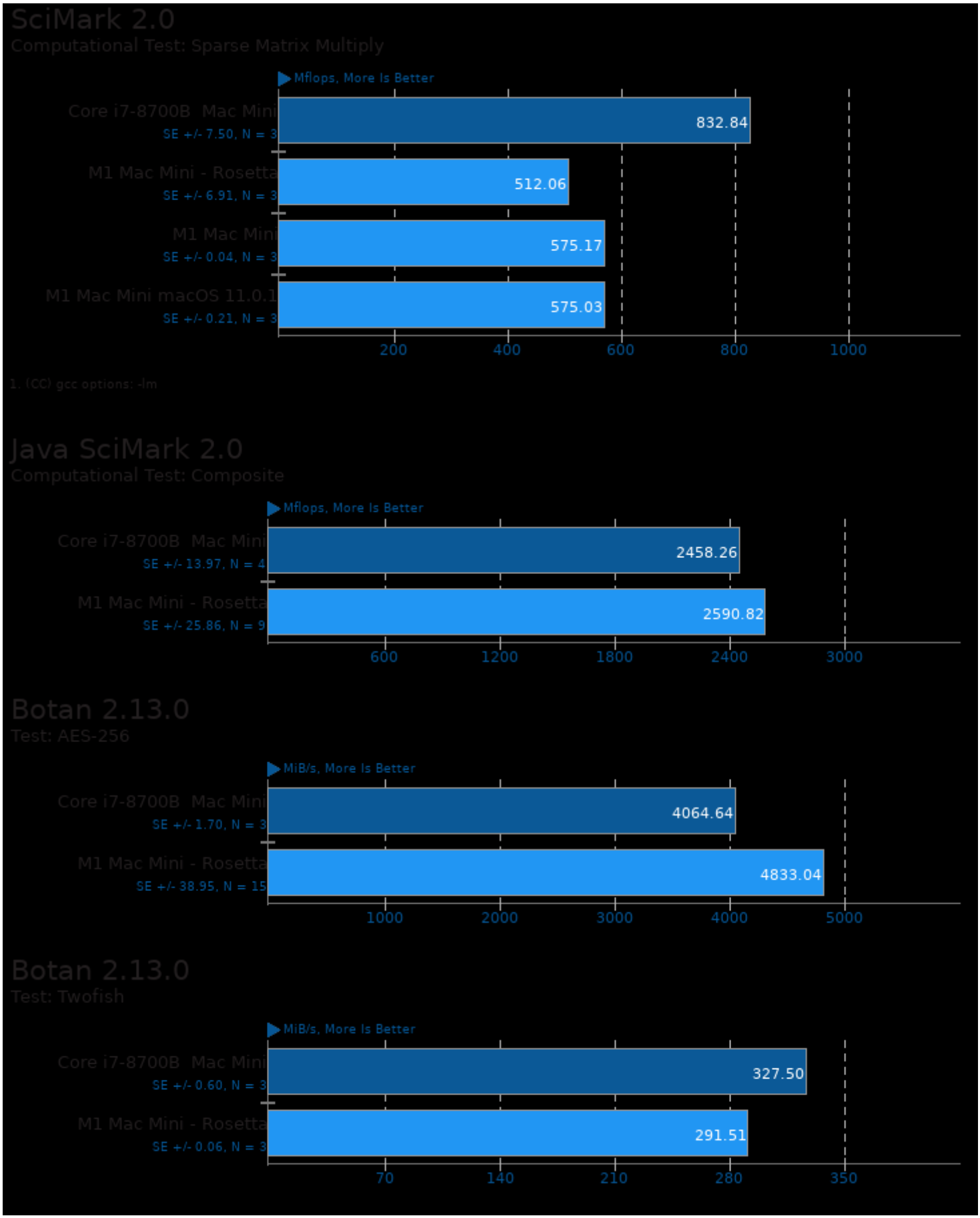
SciMark 2.0

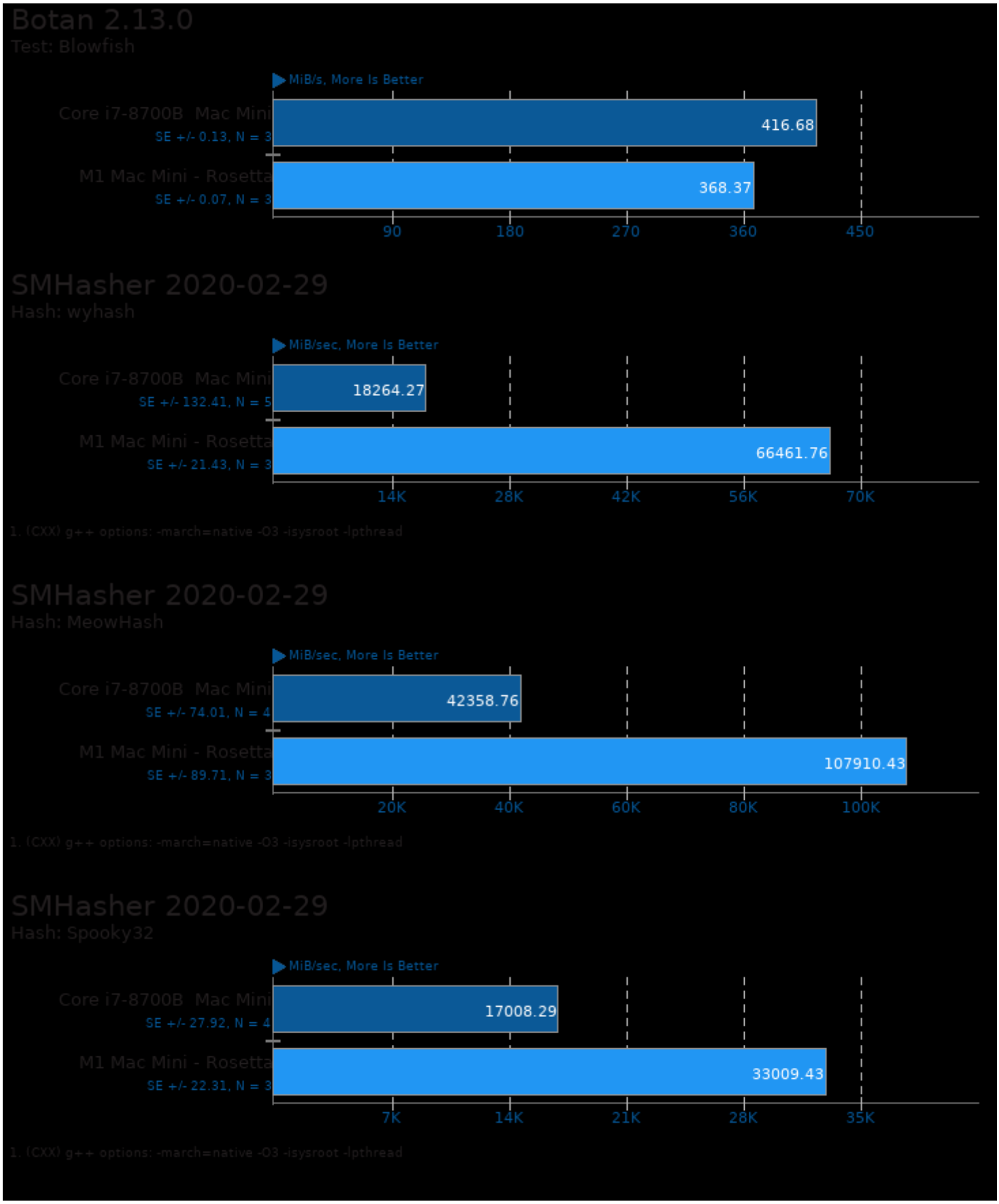
Computational Test: Fast Fourier Transform



1. (CC) gcc options: -lm

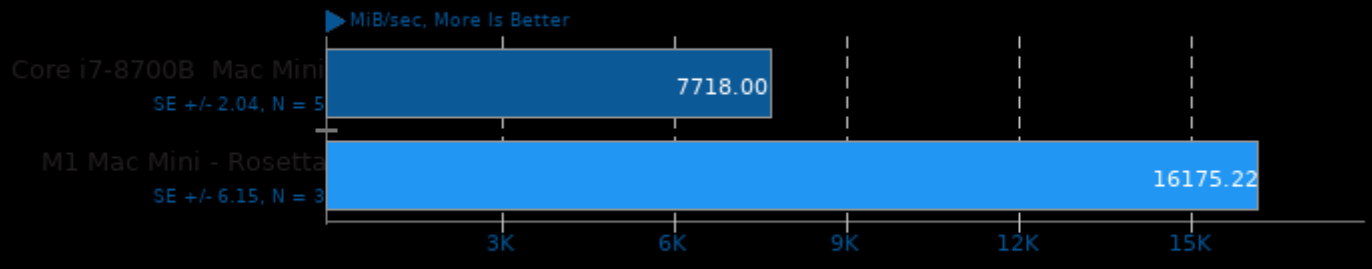
Apple M1 macOS 11.0.1 Big Sur Benchmarks




Botan 2.13.0
Test: Blowfish
MiB/s, More Is Better
Core i7-8700B Mac Mini
SE +/- 0.13, N = 3
416.68
M1 Mac Mini - Rosetta
SE +/- 0.07, N = 3
368.37
90
180
270
360
450
SMHasher 2020-02-29
Hash: wyhash
MiB/sec, More Is Better
Core i7-8700B Mac Mini
SE +/- 132.41, N = 5
18264.27
M1 Mac Mini - Rosetta
SE +/- 21.43, N = 3
66461.76
14K
28K
42K
56K
70K
1. (CXX) g++ options: -march=native -O3 -isysroot -lpthread
SMHasher 2020-02-29
Hash: MeowHash
MiB/sec, More Is Better
Core i7-8700B Mac Mini
SE +/- 74.01, N = 4
42358.76
M1 Mac Mini - Rosetta
SE +/- 89.71, N = 3
107910.43
20K
40K
60K
80K
100K
1. (CXX) g++ options: -march=native -O3 -isysroot -lpthread
SMHasher 2020-02-29
Hash: Spooky32
MiB/sec, More Is Better
Core i7-8700B Mac Mini
SE +/- 27.92, N = 4
17008.29
M1 Mac Mini - Rosetta
SE +/- 22.31, N = 3
33009.43
7K
14K
21K
28K
35K
1. (CXX) g++ options: -march=native -O3 -isysroot -lpthread

SMHasher 2020-02-29

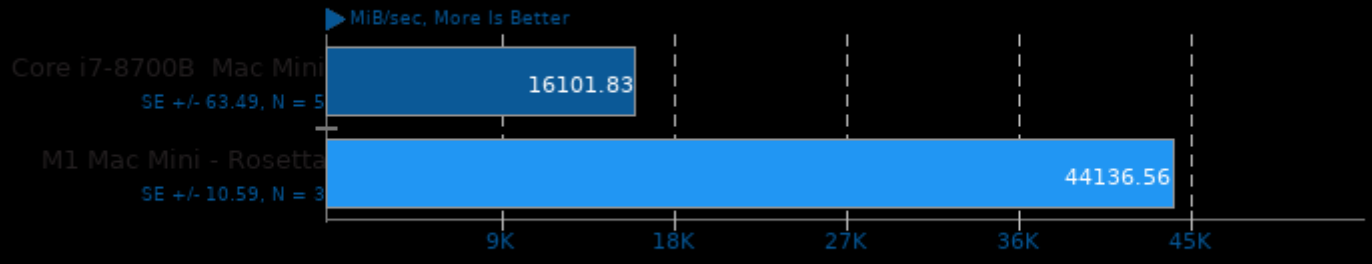
Hash: fasthash32



1. (CXX) g++ options: -march=native -O3 -isysroot -lpthread

SMHasher 2020-02-29

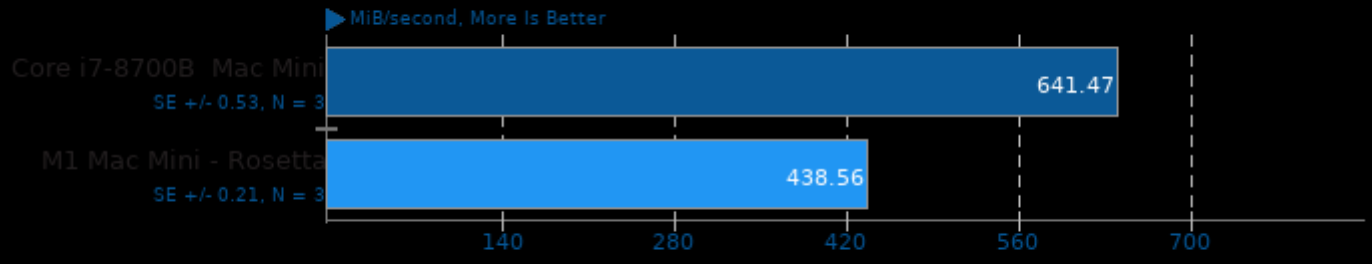
Hash: t1ha2_atonce



1. (CXX) g++ options: -march=native -O3 -isysroot -lpthread

Crypto++ 8.2

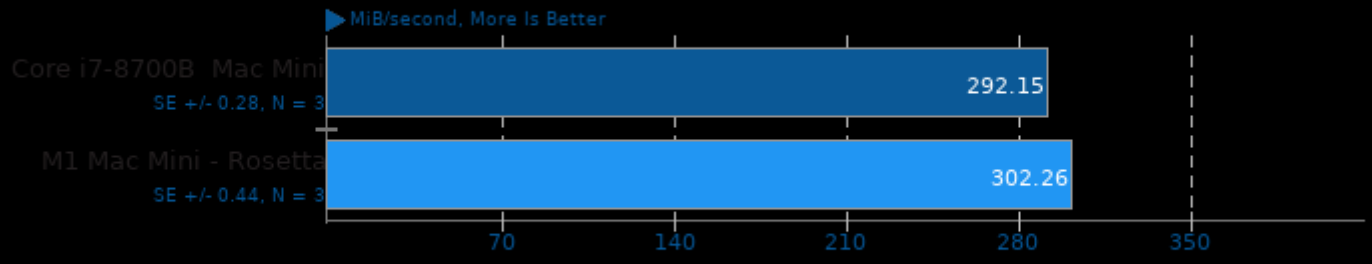
Test: Keyed Algorithms



1. (CXX) g++ options: -g2 -O3 -fPIC -pthread -pipe

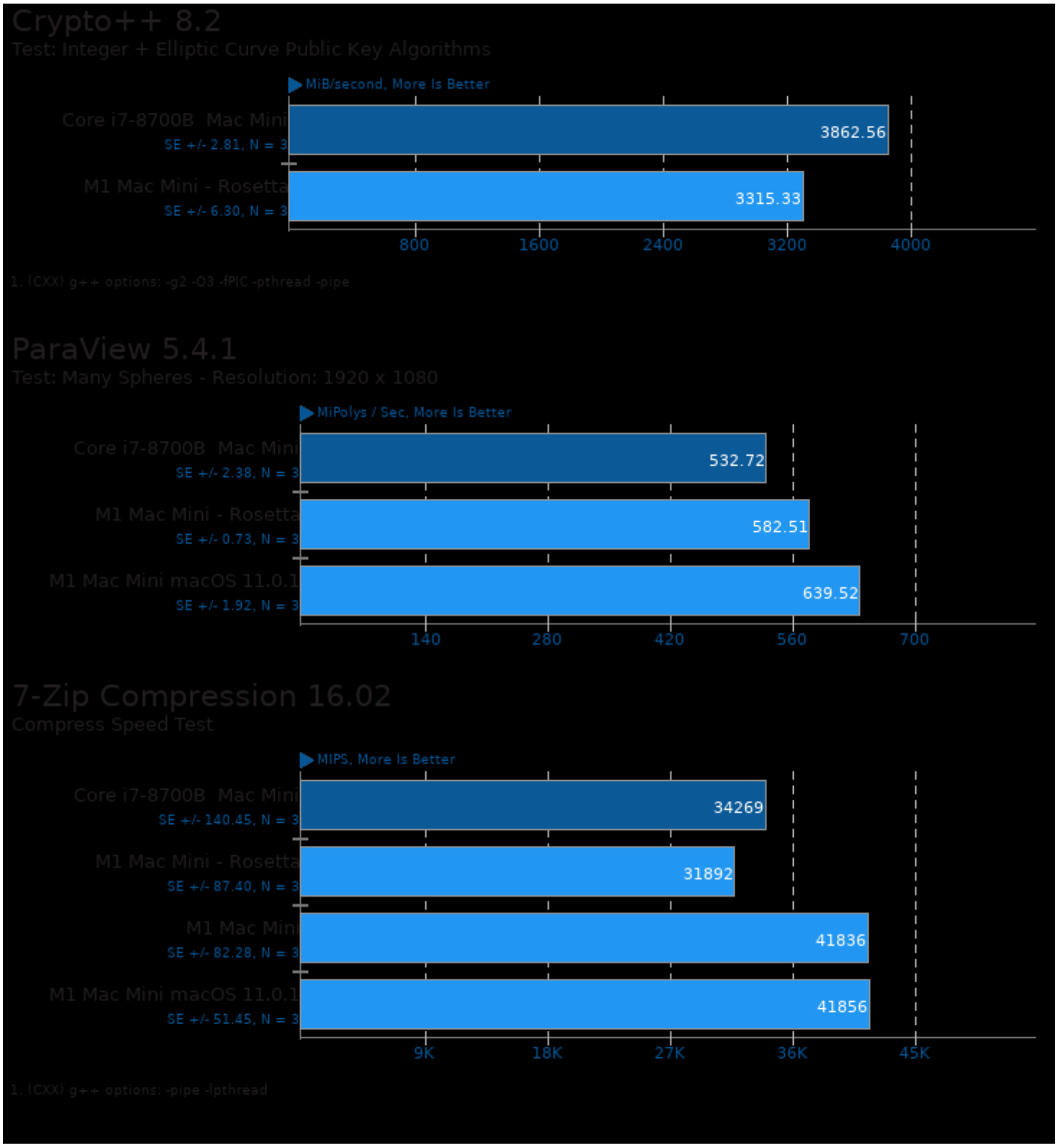
Crypto++ 8.2

Test: Unkeyed Algorithms

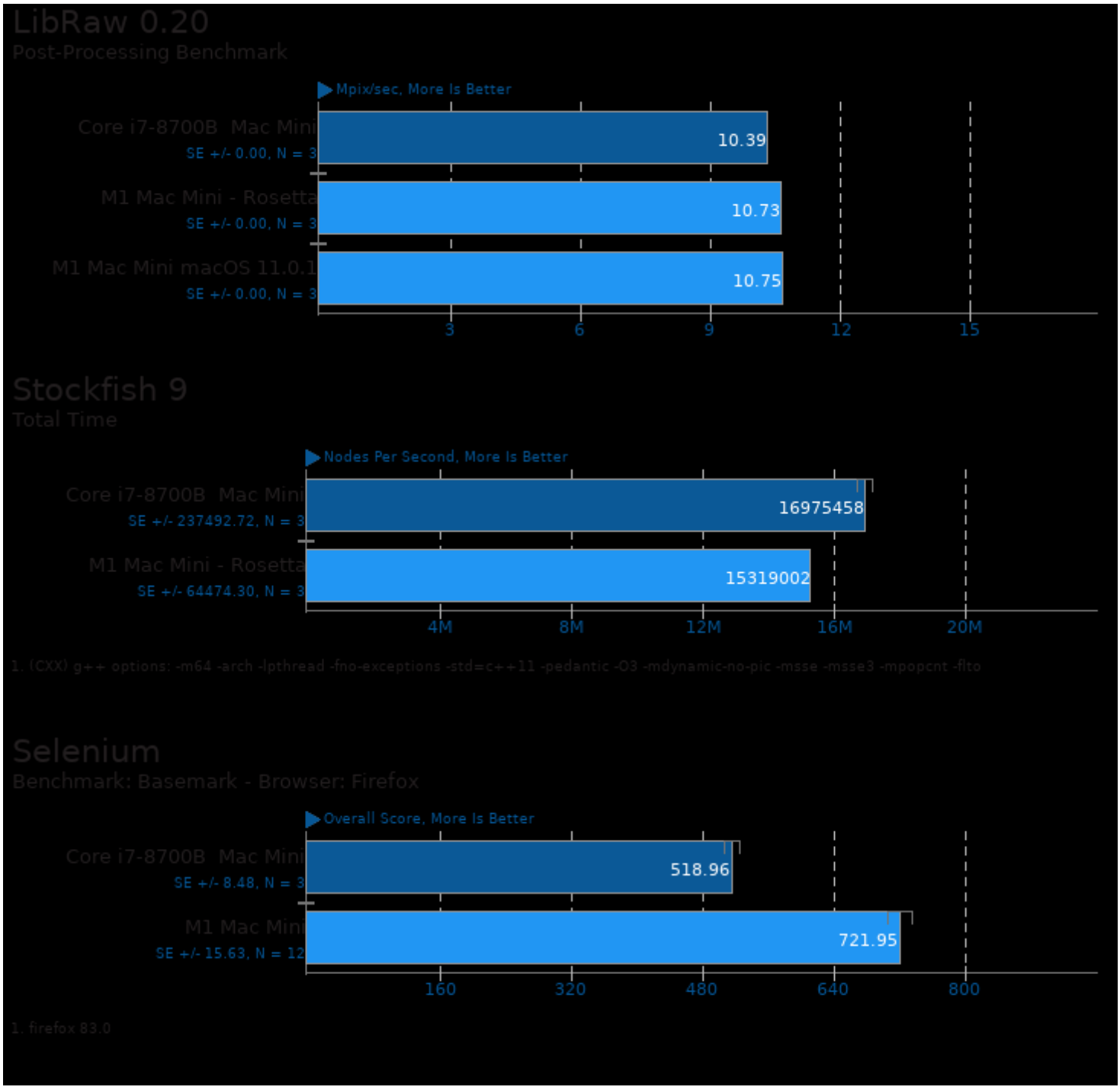


1. (CXX) g++ options: -g2 -O3 -fPIC -pthread -pipe

Apple M1 macOS 11.0.1 Big Sur Benchmarks

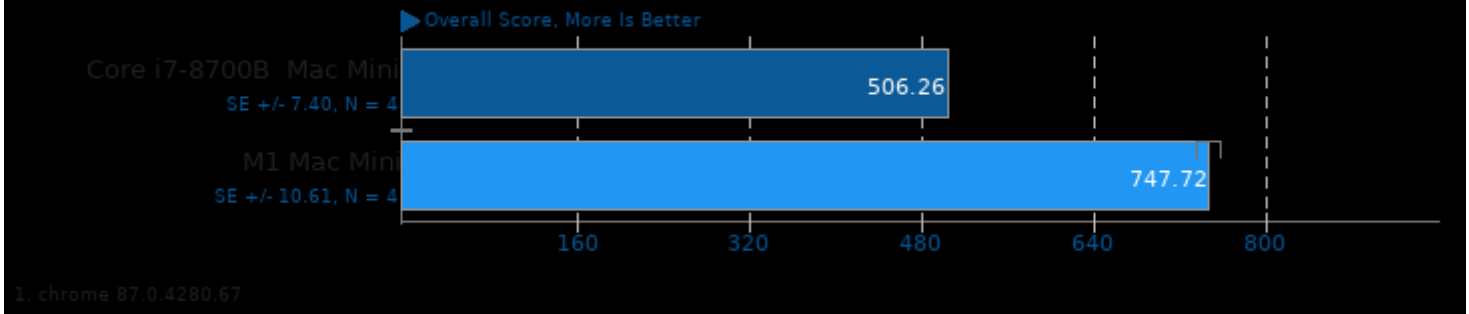


Apple M1 macOS 11.0.1 Big Sur Benchmarks



Selenium

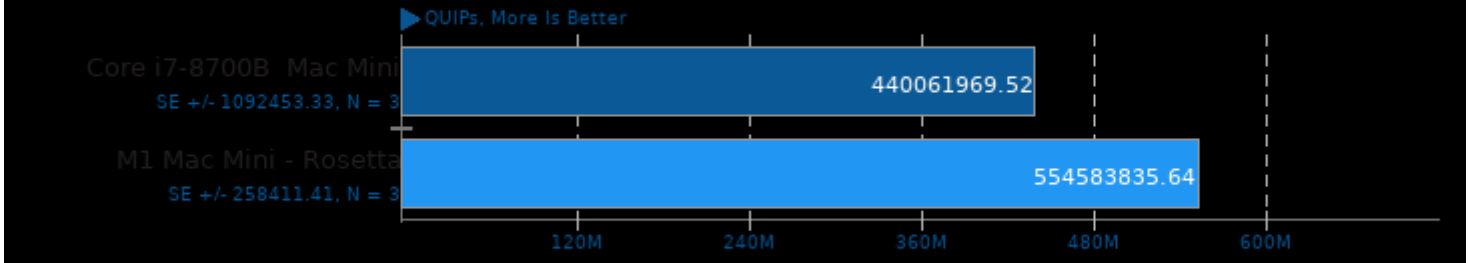
Benchmark: Basemark - Browser: Google Chrome



1. chrome 87.0.4280.67

Hierarchical INTegration 1.0

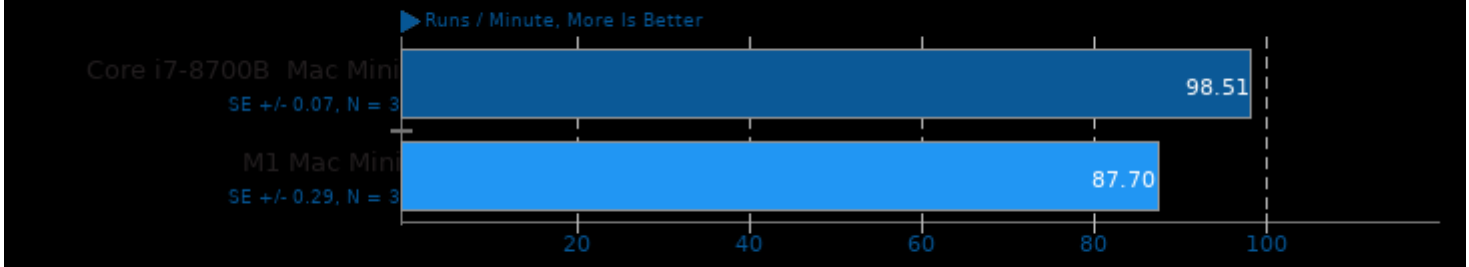
Test: FLOAT



1. (CC) gcc options: -O3 -march=native -lm

Selenium

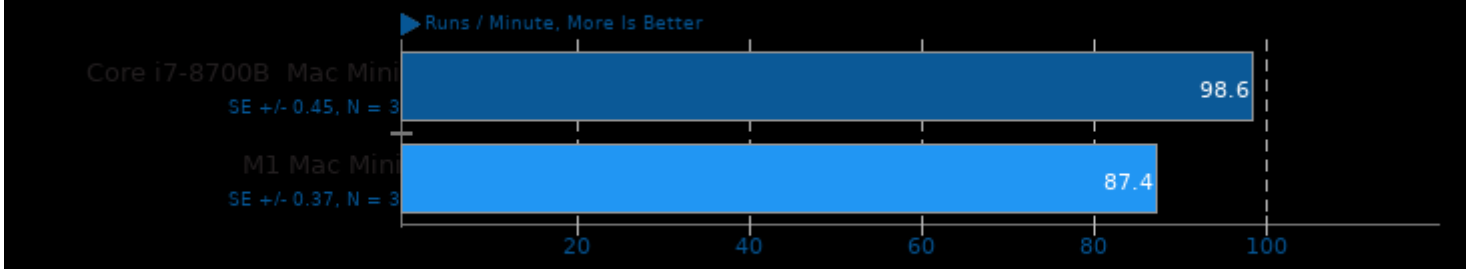
Benchmark: StyleBench - Browser: Firefox



1. firefox 83.0

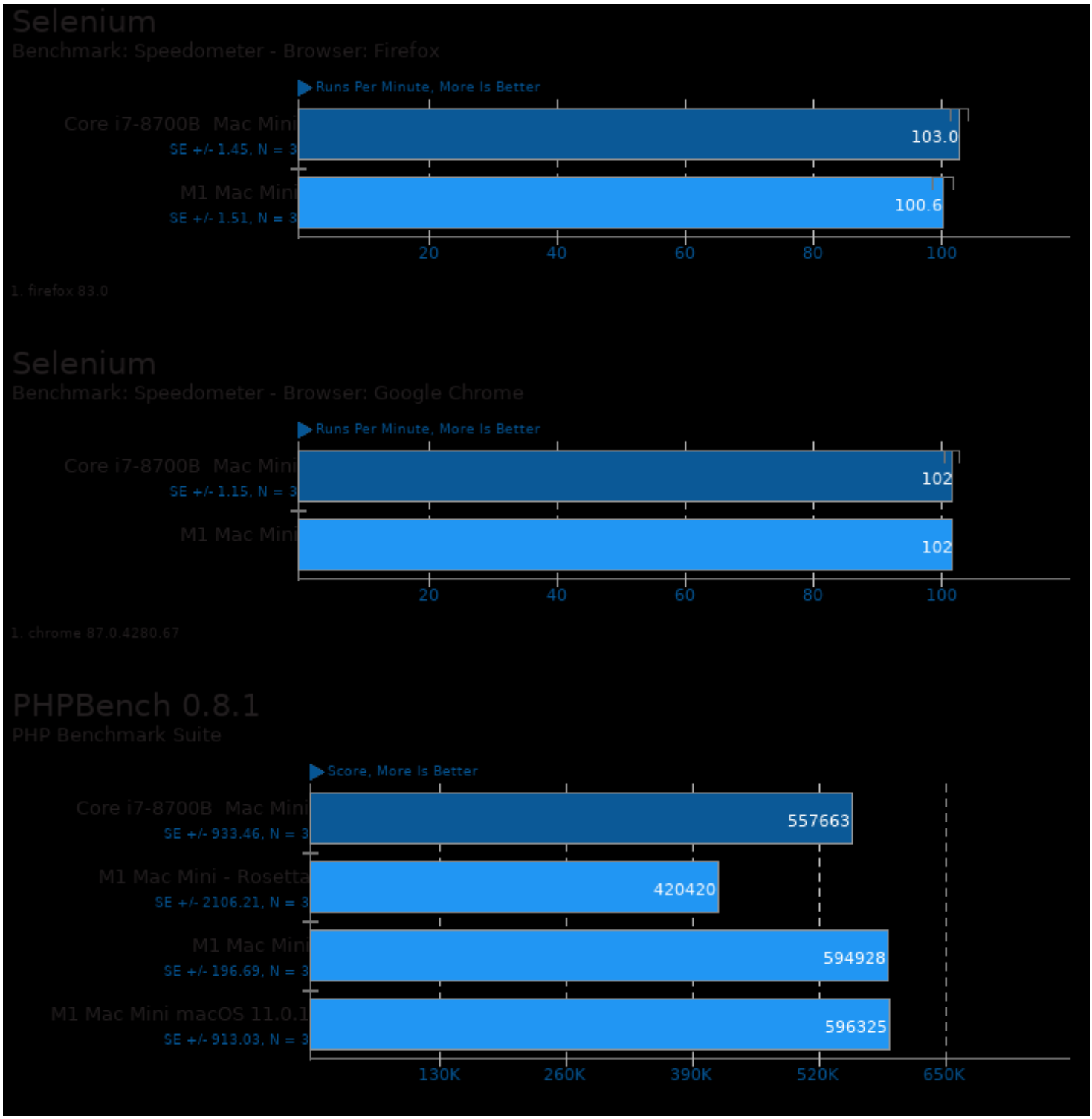
Selenium

Benchmark: StyleBench - Browser: Google Chrome

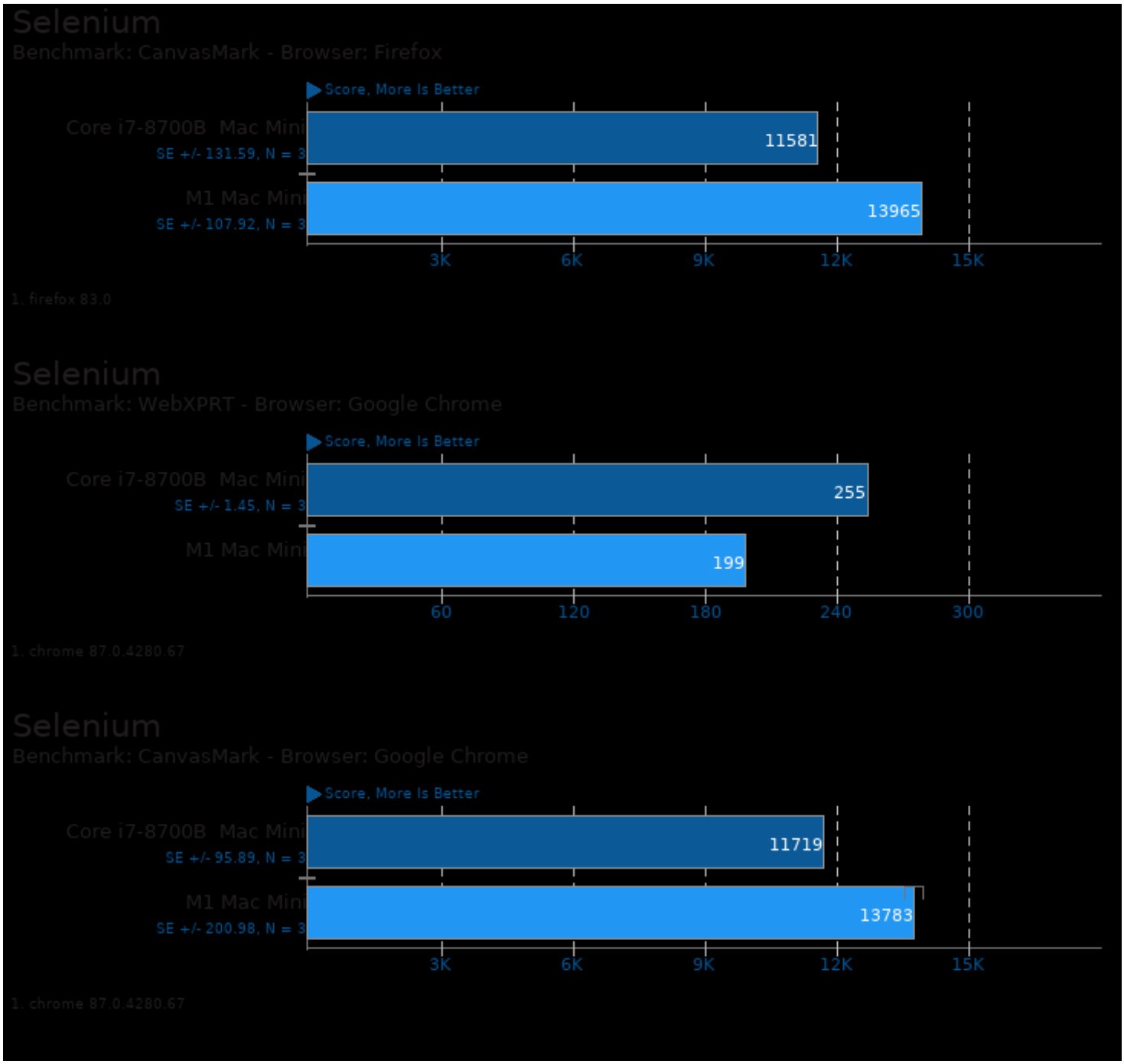


1. chrome 87.0.4280.67

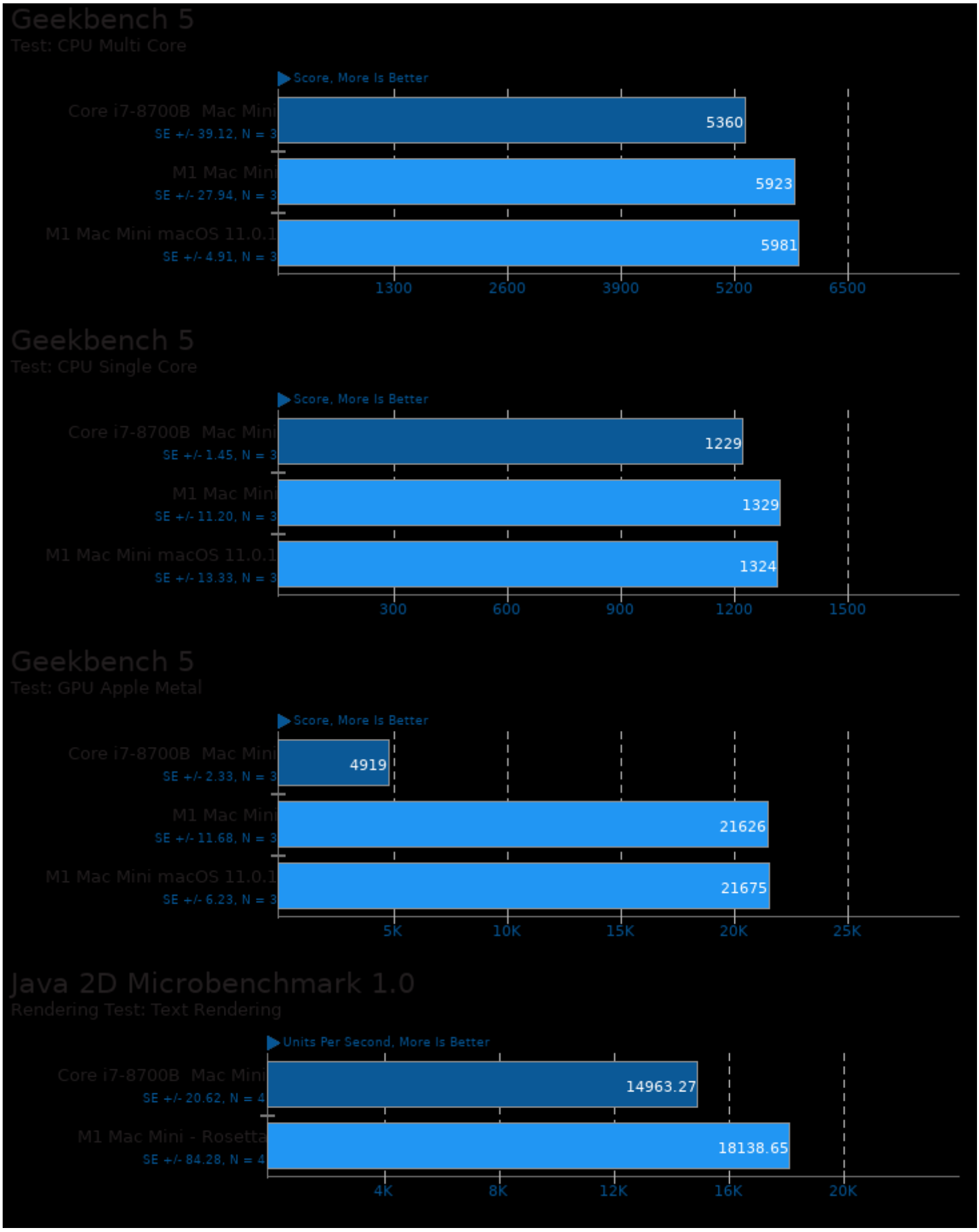
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks



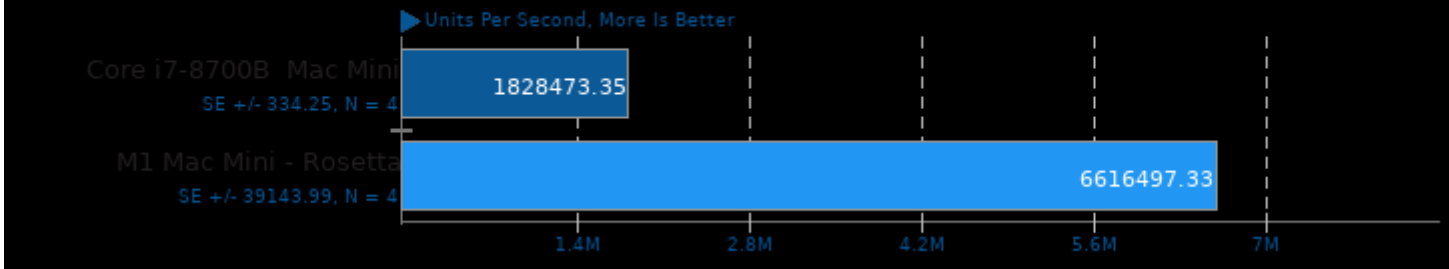
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks

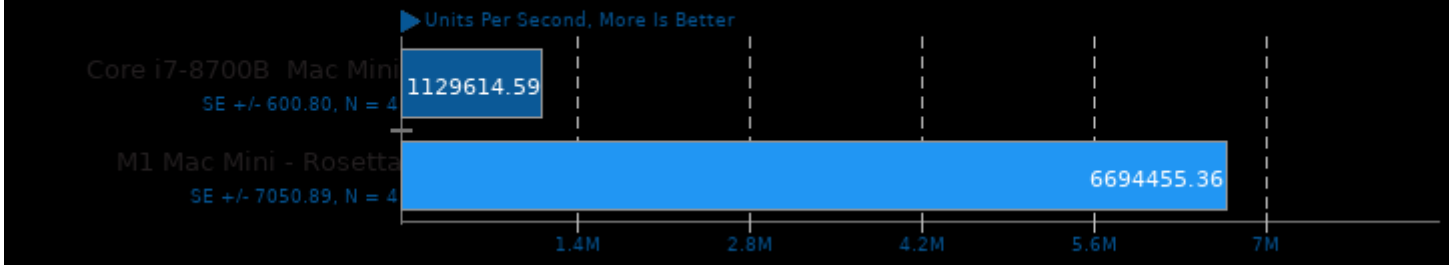
Java 2D Microbenchmark 1.0

Rendering Test: Image Rendering



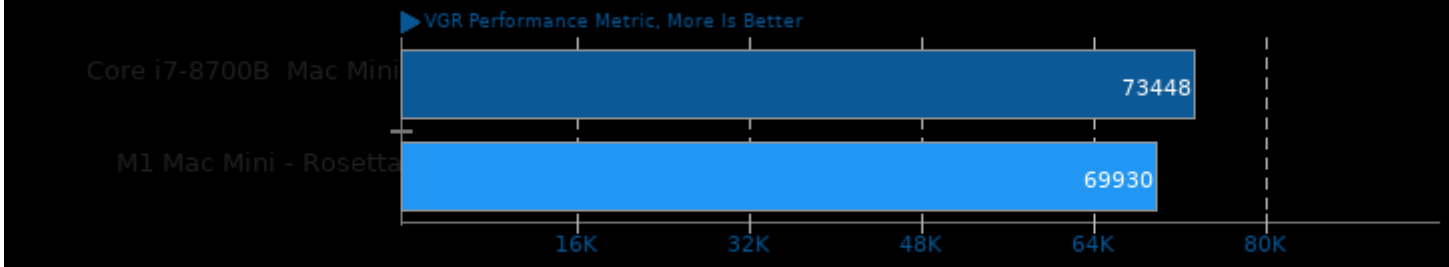
Java 2D Microbenchmark 1.0

Rendering Test: Vector Graphics Rendering



BRL-CAD 7.30.8

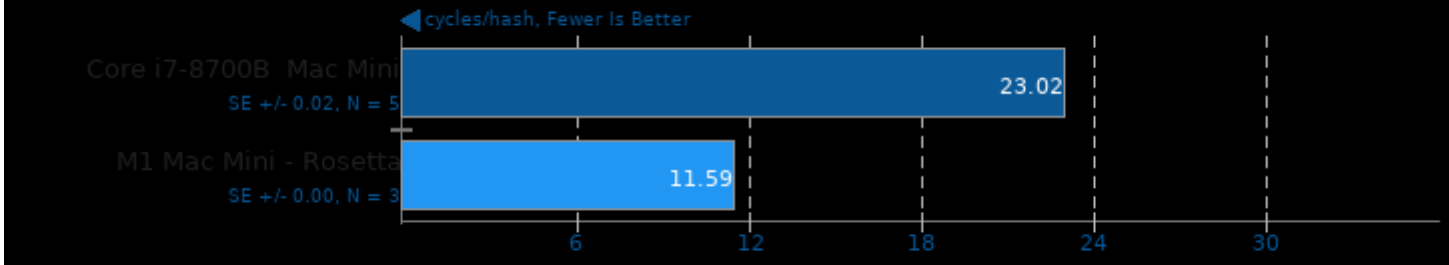
VGR Performance Metric



1. (CXX) g++ options: -std=c++11 -pipe -fno-strict-aliasing -fno-common -fexceptions -ftemplate-depth-128 -m64 -ggdb -Qunused-arguments -O3 -finlin

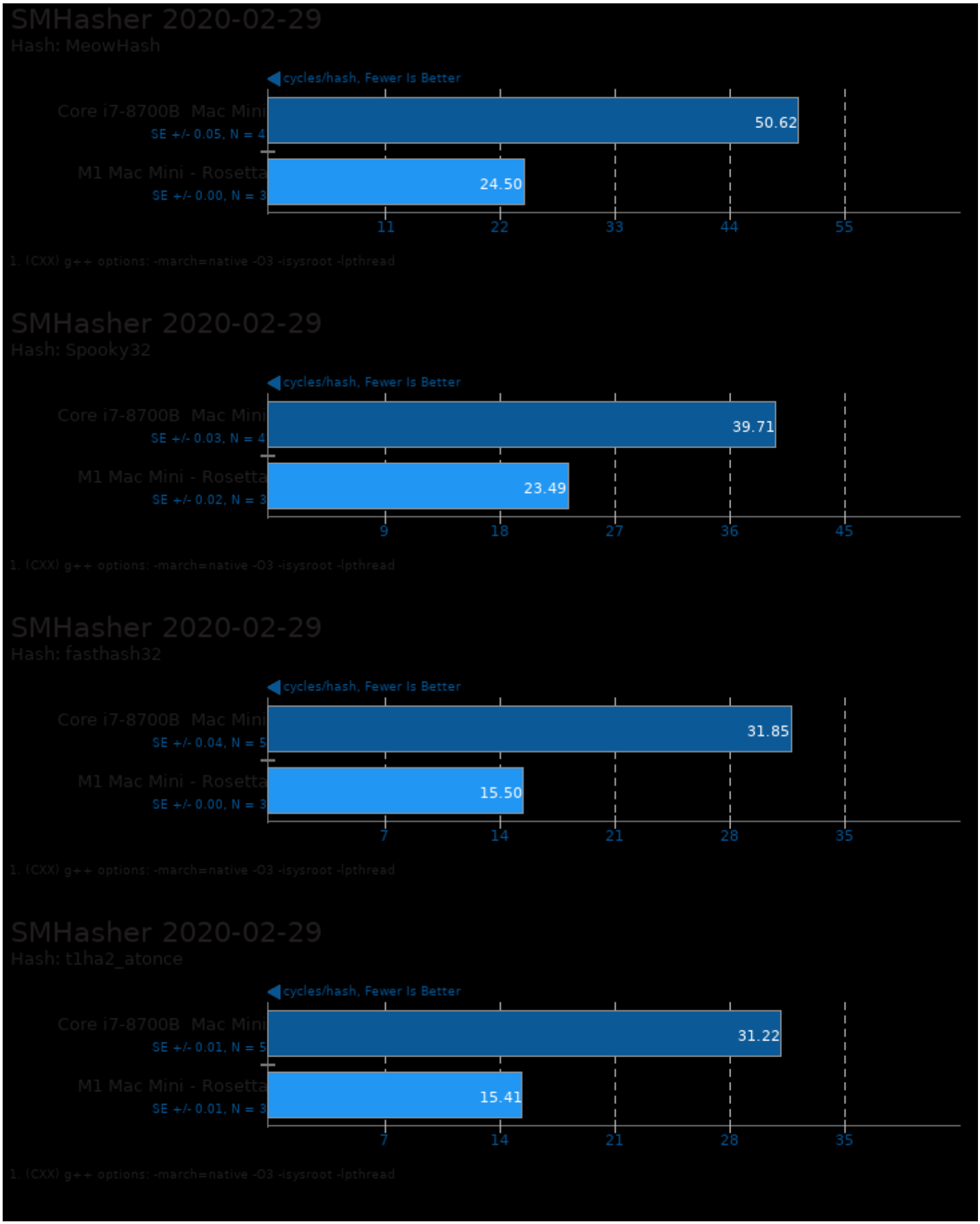
SMHasher 2020-02-29

Hash: wyhash

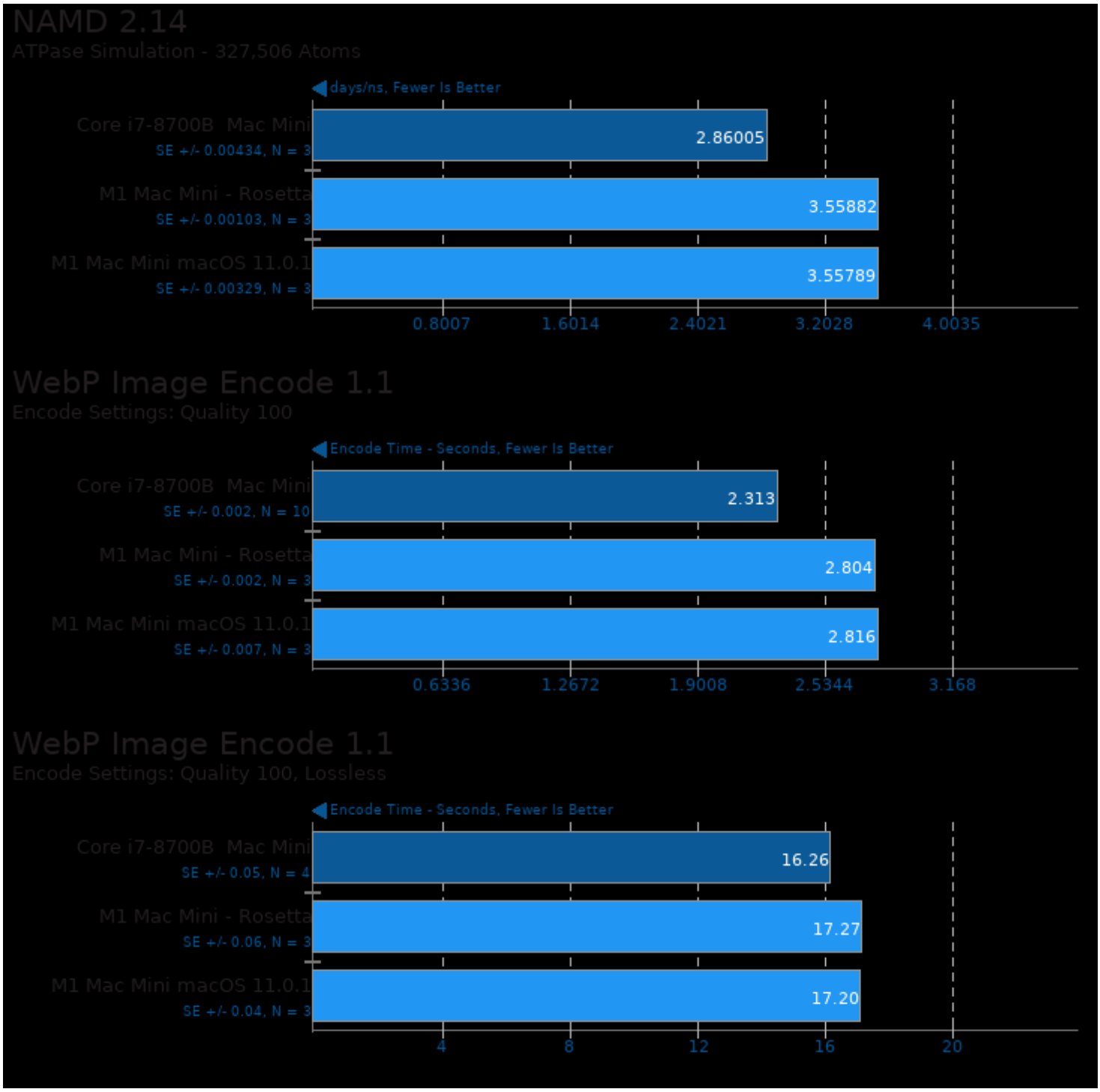


1. (CXX) g++ options: -march=native -O3 -isysroot -lpthread

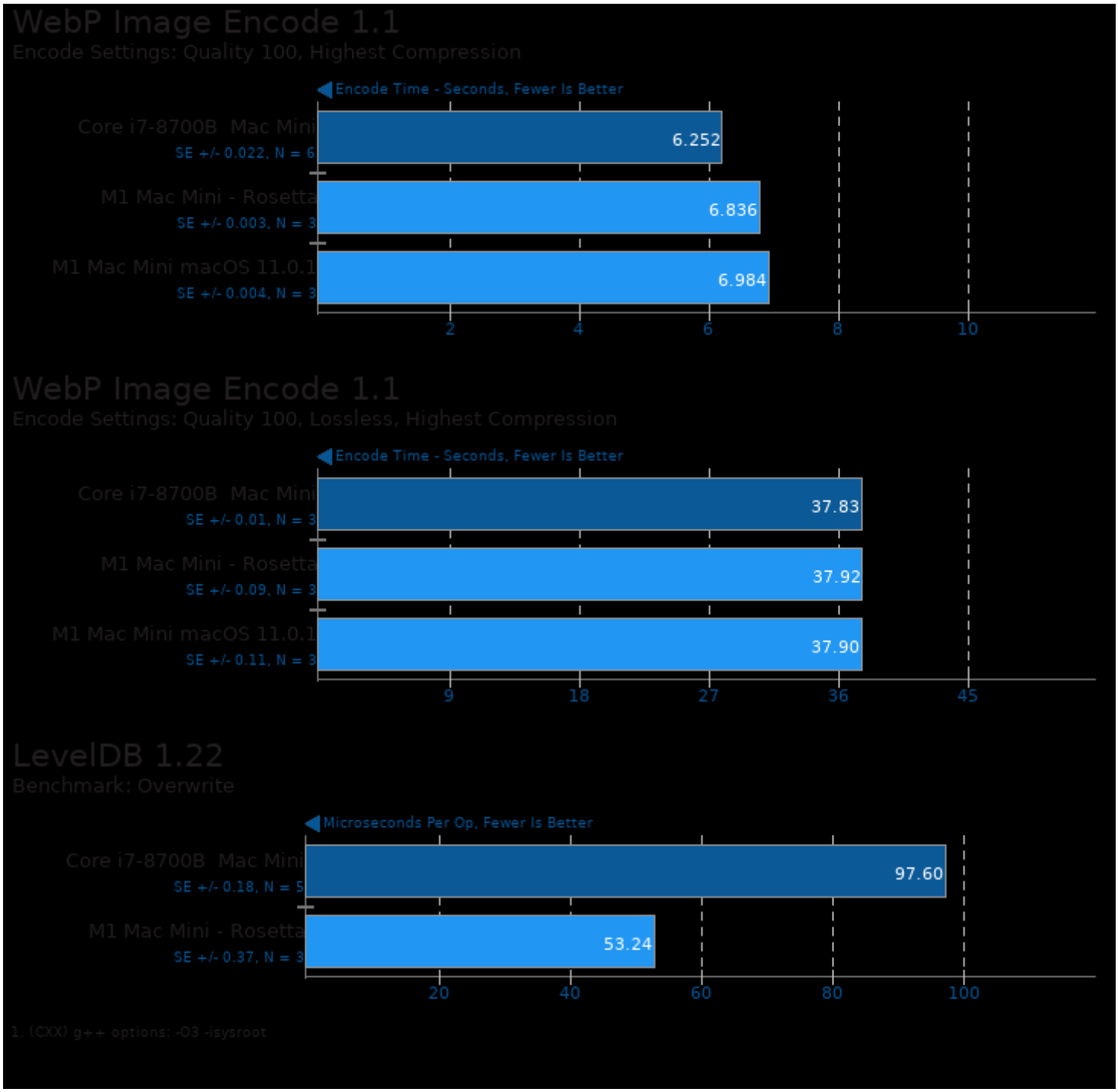
Apple M1 macOS 11.0.1 Big Sur Benchmarks



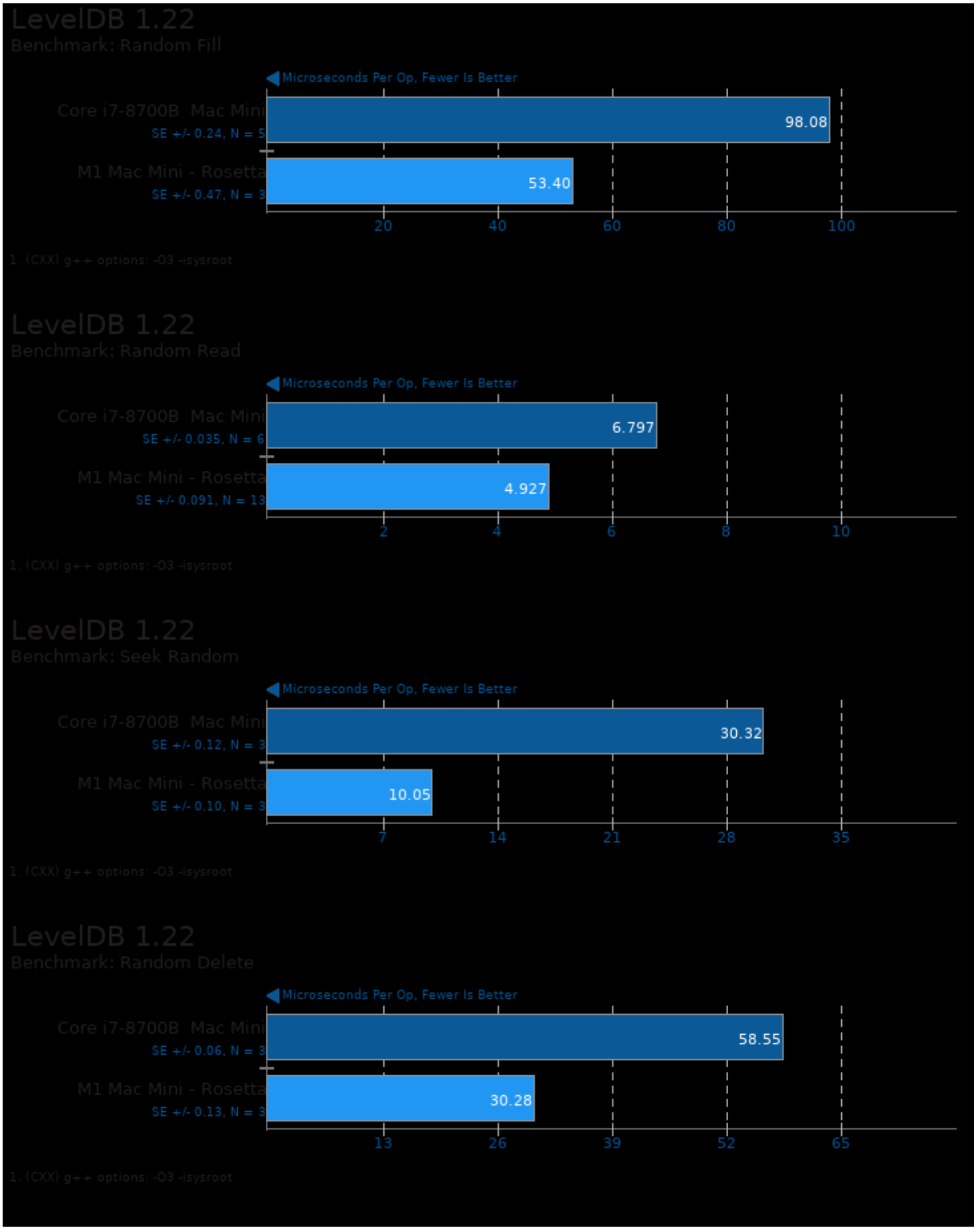
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks



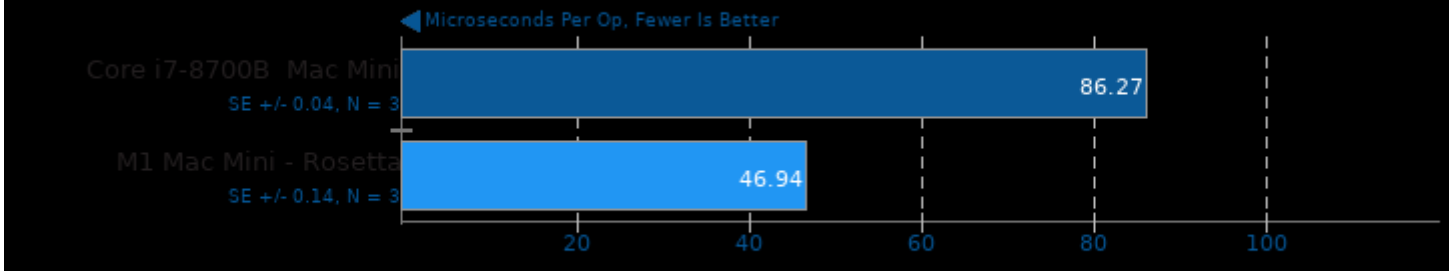
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks

LevelDB 1.22

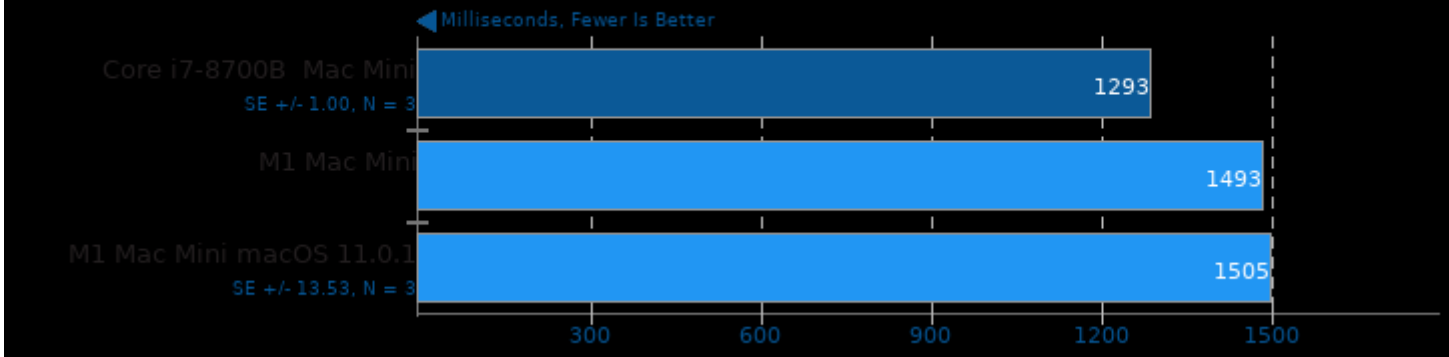
Benchmark: Sequential Fill



1. (CXX) g++ options: -O3 -isysroot

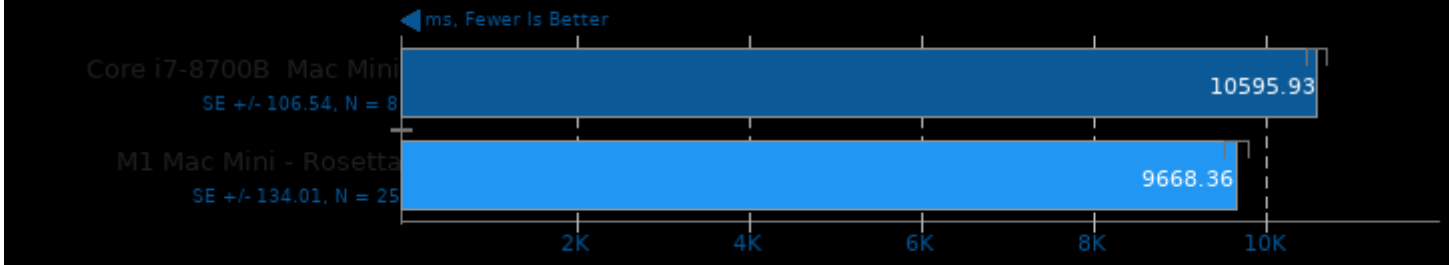
PyBench 2018-02-16

Total For Average Test Times



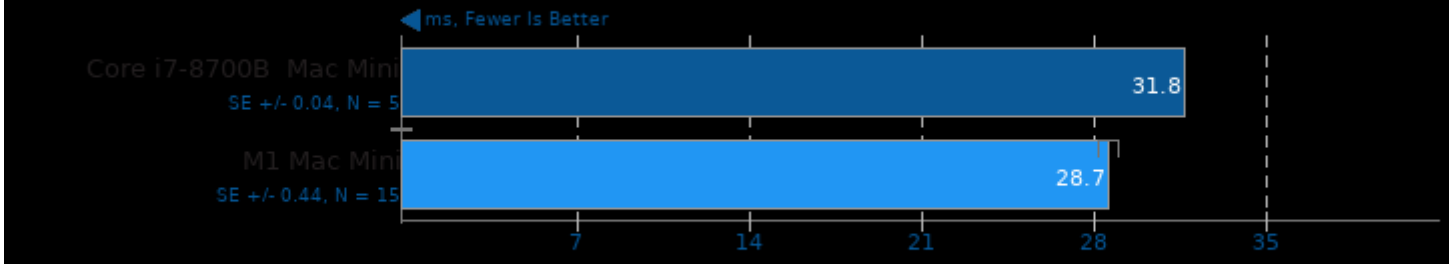
Renaissance 0.10.0

Test: Savina Reactors.IO



Selenium

Benchmark: WASM imageConvolute - Browser: Firefox

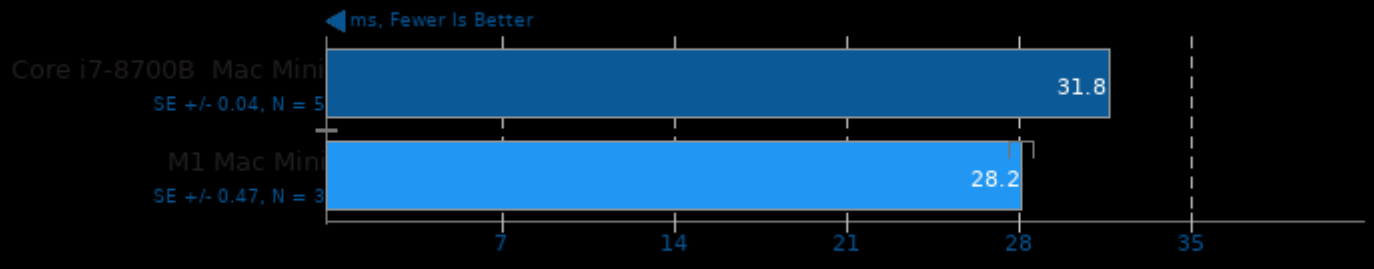


1. firefox 83.0

Apple M1 macOS 11.0.1 Big Sur Benchmarks

Selenium

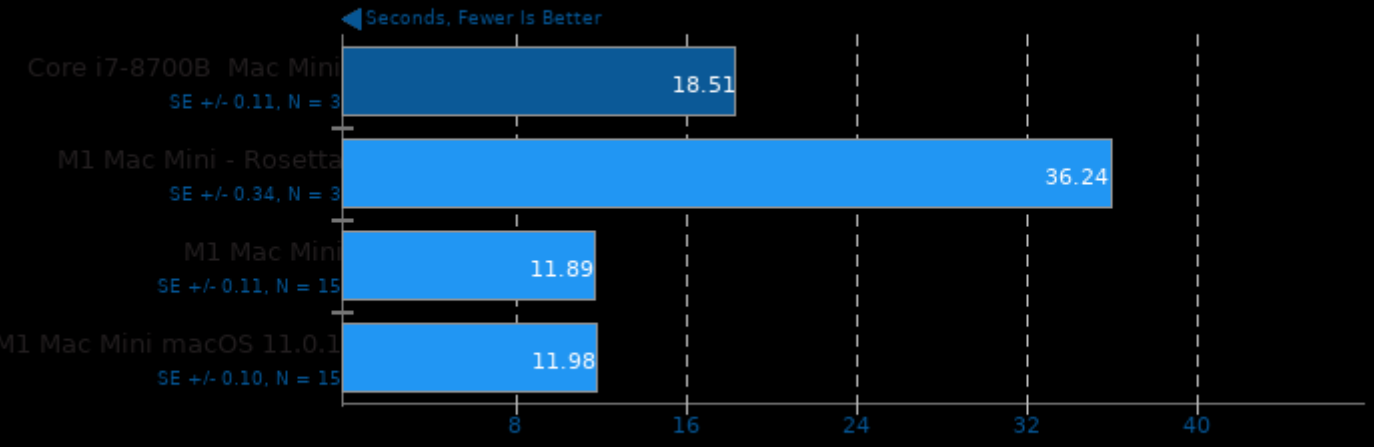
Benchmark: WASM imageConvolute - Browser: Google Chrome



1. chrome 87.0.4280.67

Timed MAFFT Alignment 7.471

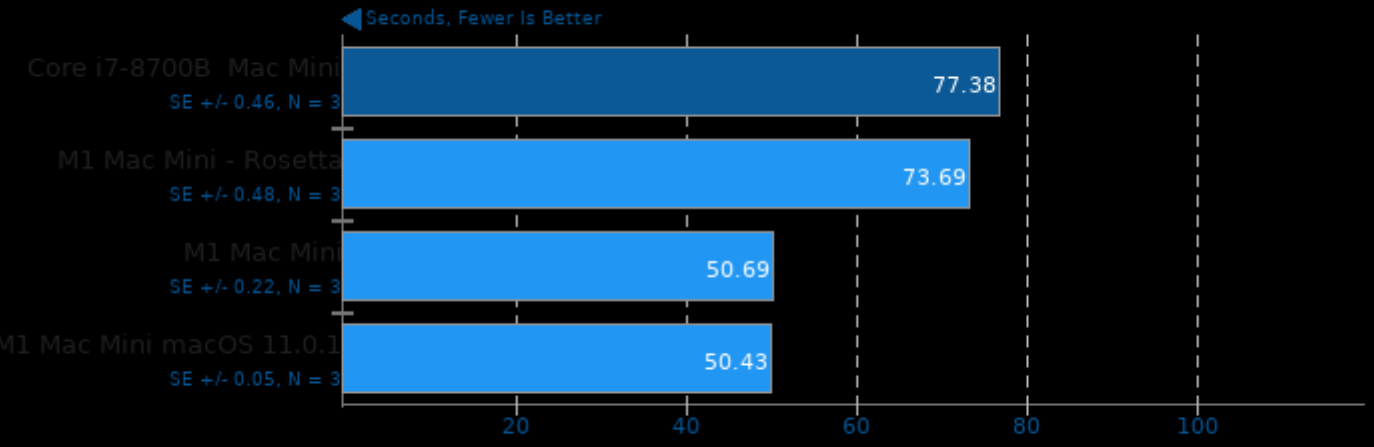
Multiple Sequence Alignment - LSU RNA



1. (CC) gcc options: -std=c99 -O3 -lm -lpthread

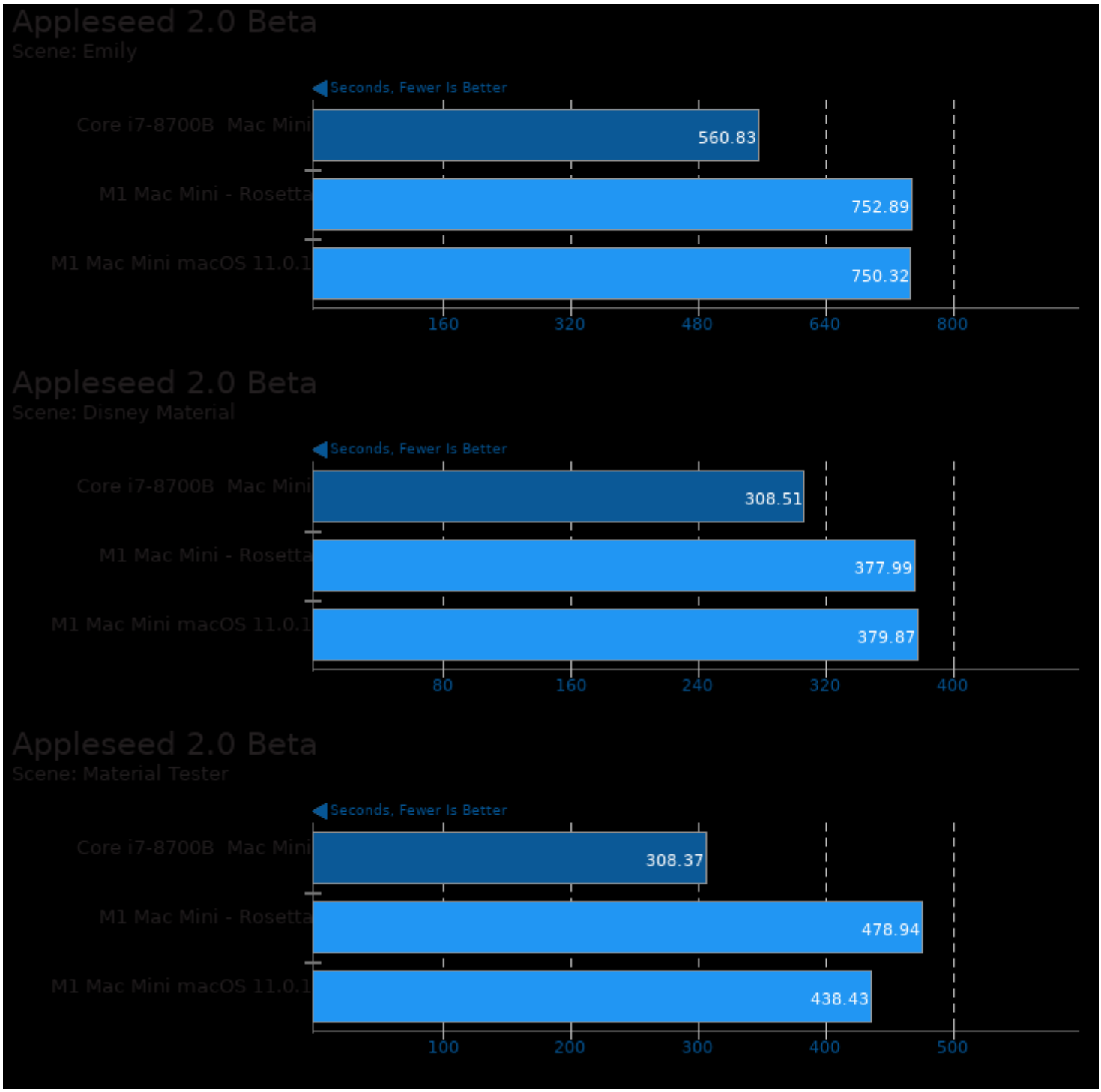
SQLite Speedtest 3.30

Timed Time - Size 1,000



1. (CC) gcc options: -O2 -lz

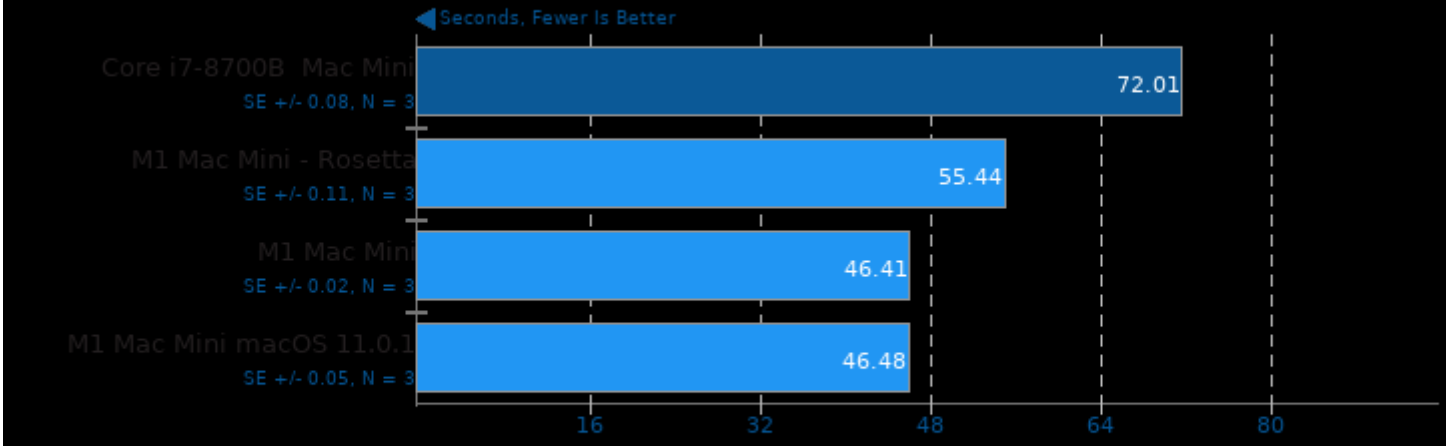
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks

Git

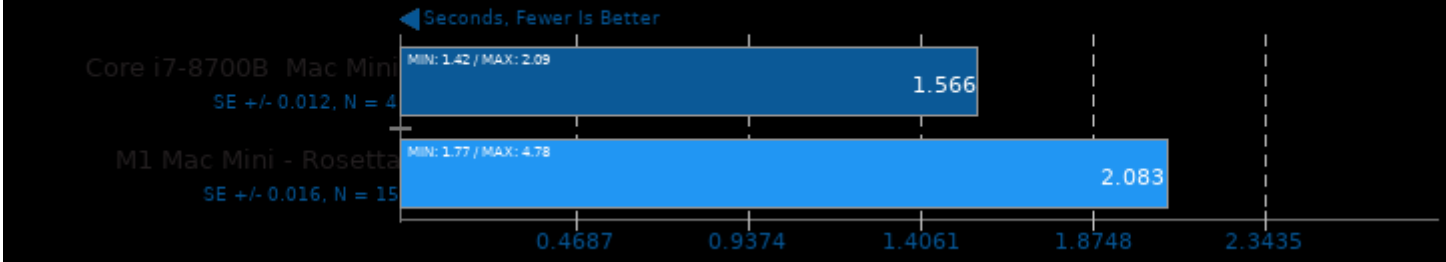
Time To Complete Common Git Commands



1. Core i7-8700B Mac Mini: git version 2.21.0 (Apple Git-122)
2. M1 Mac Mini - Rosetta: git version 2.24.3 (Apple Git-128)
3. M1 Mac Mini: git version 2.24.3 (Apple Git-128)
4. M1 Mac Mini macOS 11.0.1: git version 2.24.3 (Apple Git-128)

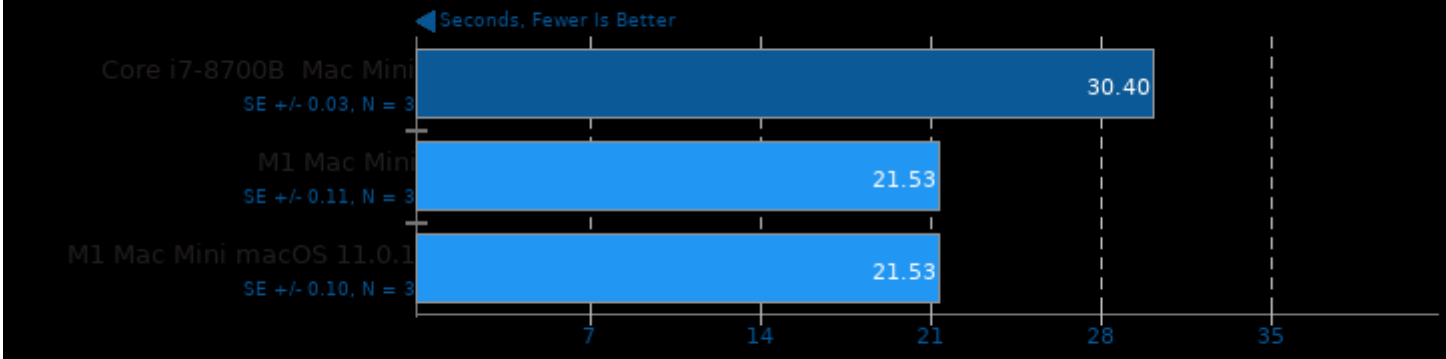
Sunflow Rendering System 0.07.2

Global Illumination + Image Synthesis

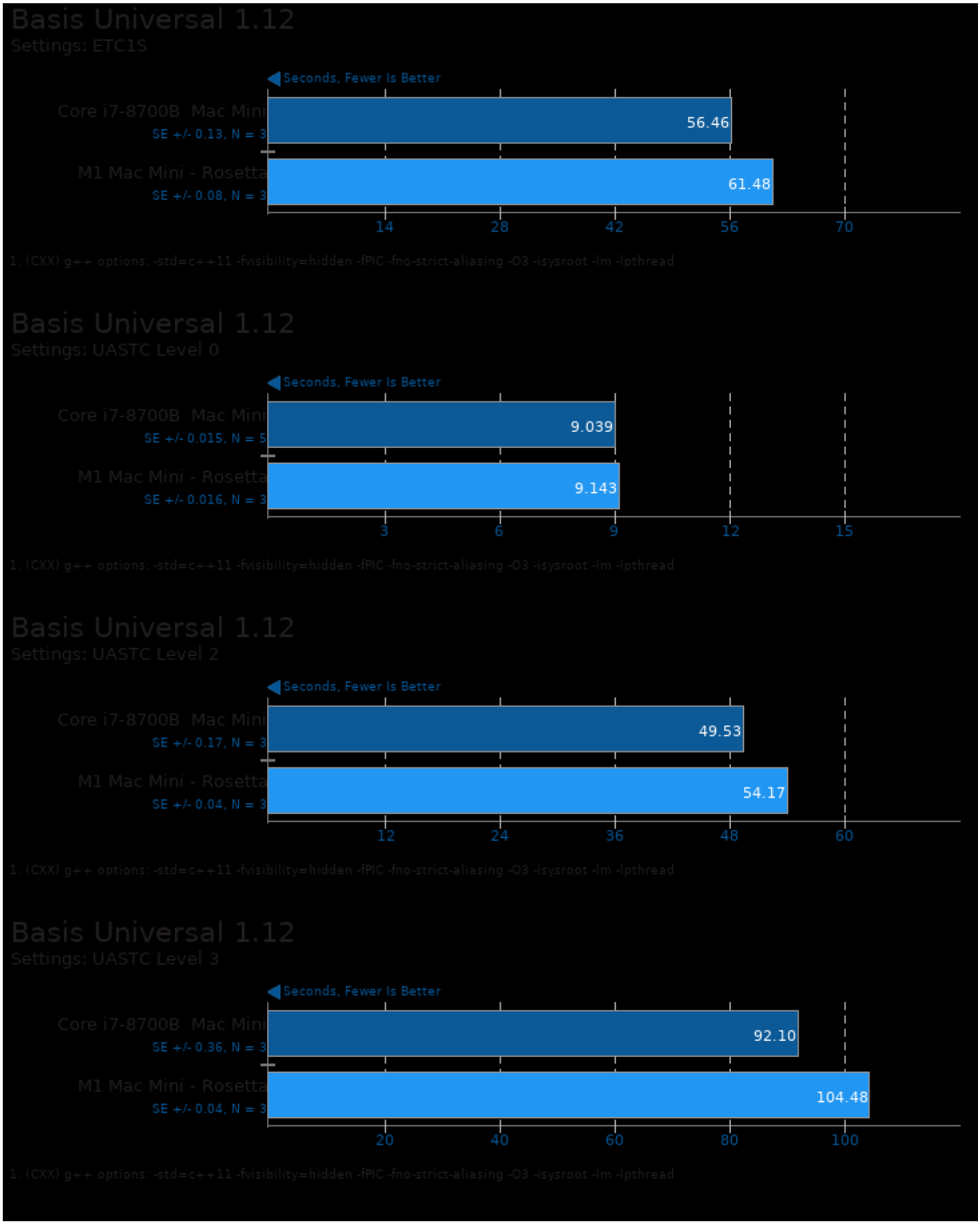


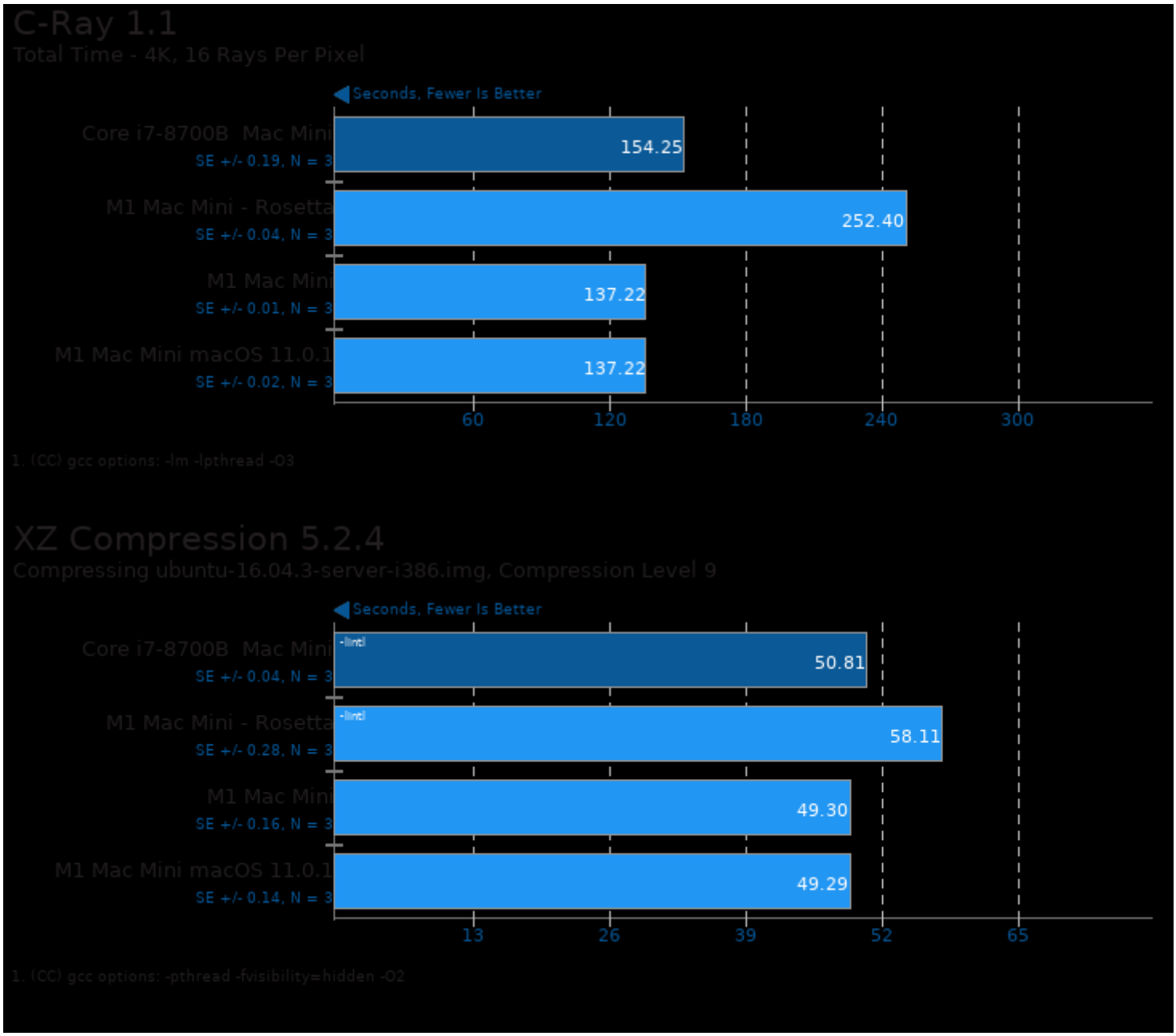
AOBench

Size: 2048 x 2048 - Total Time

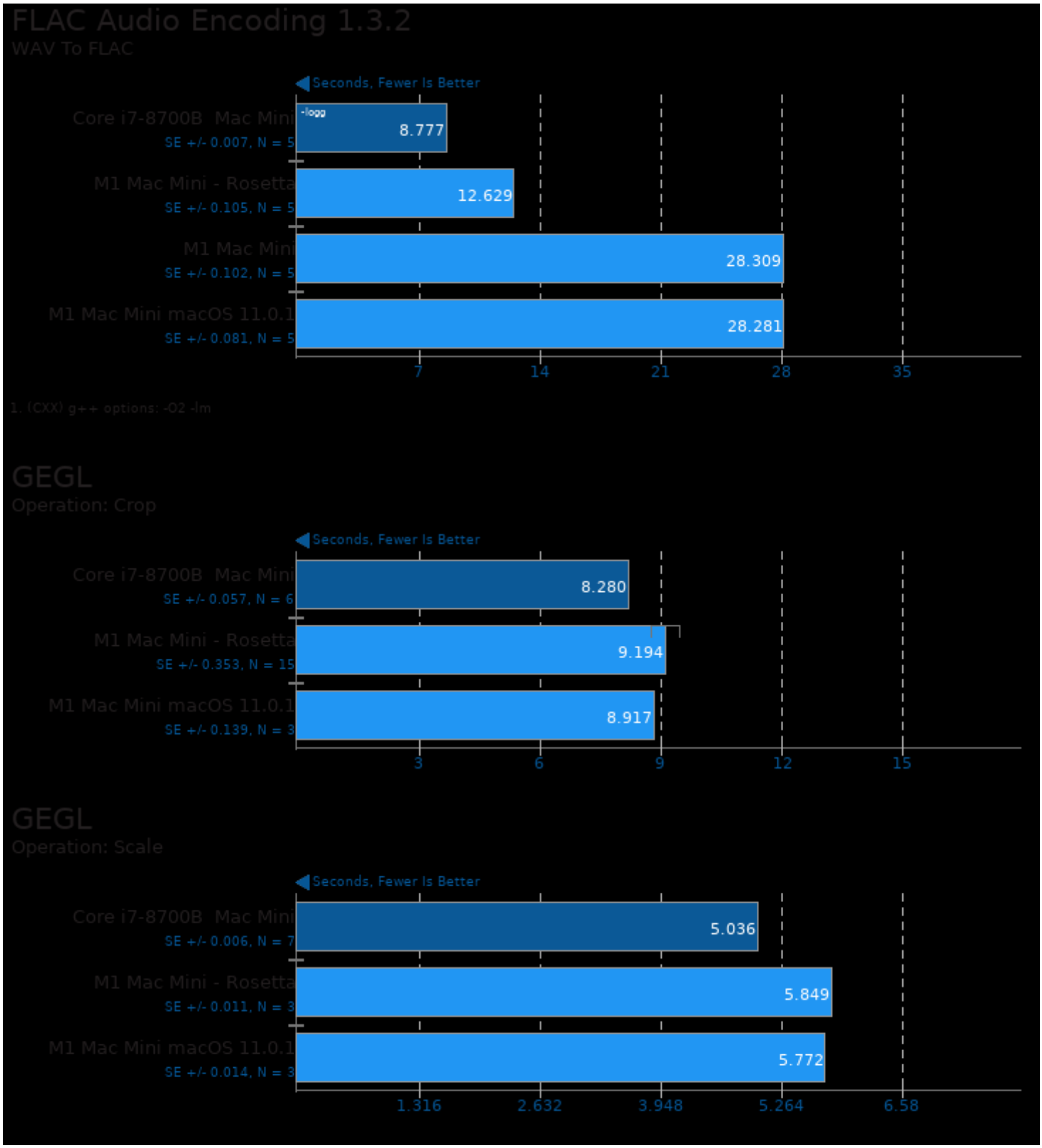


1. (CC) gcc options: -lm -O3

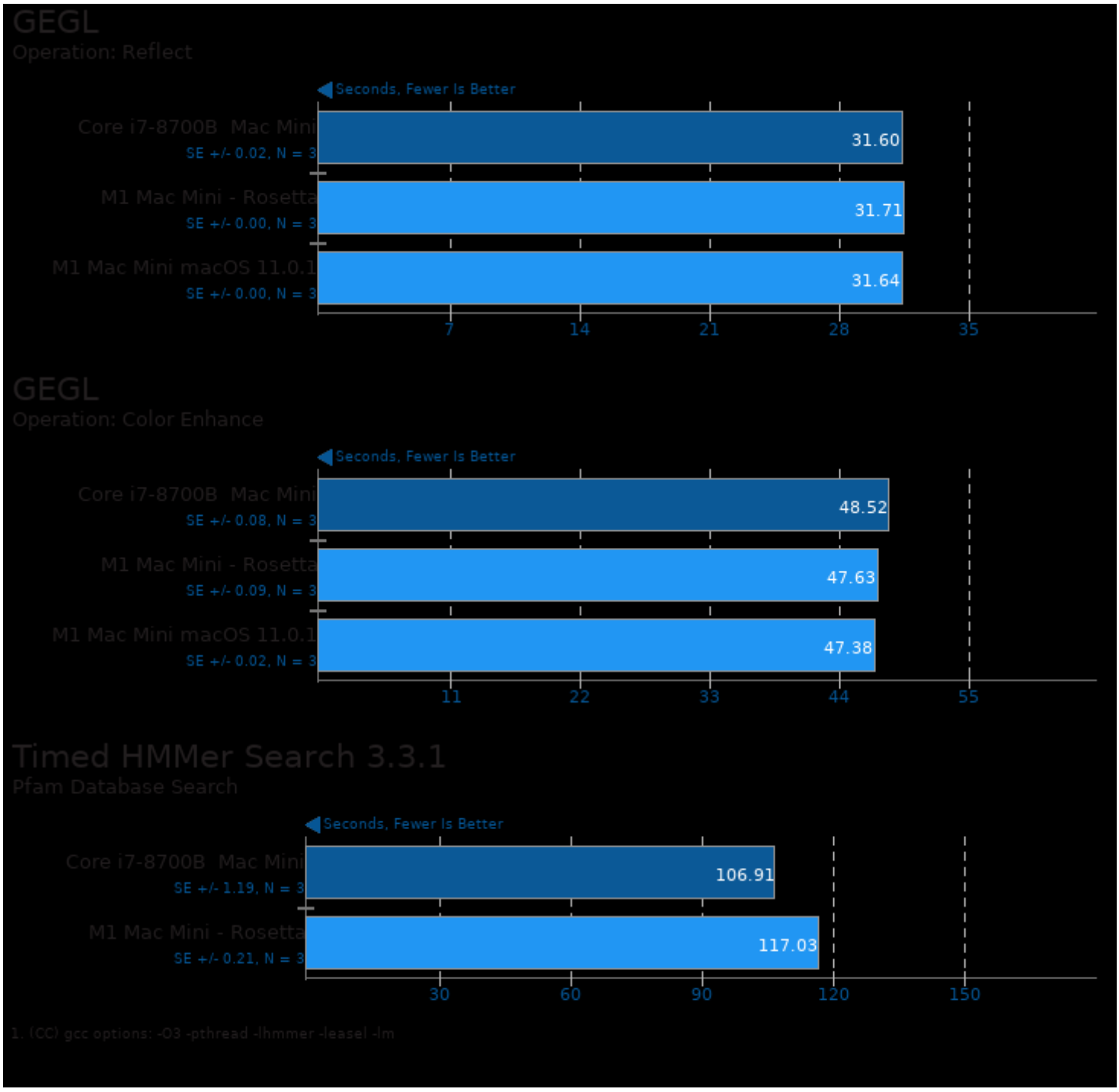

Basis Universal 1.12
Settings: ETC1S
Seconds, Fewer Is Better
Core i7-8700B Mac Mini
SE +/- 0.13, N = 3
56.46
M1 Mac Mini - Rosetta
SE +/- 0.08, N = 3
61.48
14
28
42
56
70
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -isysroot -lm -lpthread
Basis Universal 1.12
Settings: UASTC Level 0
Seconds, Fewer Is Better
Core i7-8700B Mac Mini
SE +/- 0.015, N = 5
9.039
M1 Mac Mini - Rosetta
SE +/- 0.016, N = 3
9.143
3
6
9
12
15
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -isysroot -lm -lpthread
Basis Universal 1.12
Settings: UASTC Level 2
Seconds, Fewer Is Better
Core i7-8700B Mac Mini
SE +/- 0.17, N = 3
49.53
M1 Mac Mini - Rosetta
SE +/- 0.04, N = 3
54.17
12
24
36
48
60
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -isysroot -lm -lpthread
Basis Universal 1.12
Settings: UASTC Level 3
Seconds, Fewer Is Better
Core i7-8700B Mac Mini
SE +/- 0.36, N = 3
92.10
M1 Mac Mini - Rosetta
SE +/- 0.04, N = 3
104.48
20
40
60
80
100
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -isysroot -lm -lpthread


C-Ray 1.1
Total Time - 4K, 16 Rays Per Pixel
Seconds, Fewer Is Better
Core i7-8700B Mac Mini
SE +/- 0.19, N = 3
154.25
M1 Mac Mini - Rosetta
SE +/- 0.04, N = 3
252.40
M1 Mac Mini
SE +/- 0.01, N = 3
137.22
M1 Mac Mini macOS 11.0.1
SE +/- 0.02, N = 3
137.22
60
120
180
240
300
1. (CC) gcc options: -lm -lpthread -O3
XZ Compression 5.2.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 9
Seconds, Fewer Is Better
Core i7-8700B Mac Mini
SE +/- 0.04, N = 3
50.81
M1 Mac Mini - Rosetta
SE +/- 0.28, N = 3
58.11
M1 Mac Mini
SE +/- 0.16, N = 3
49.30
M1 Mac Mini macOS 11.0.1
SE +/- 0.14, N = 3
49.29
13
26
39
52
65
1. (CC) gcc options: -pthread -fvisibility=hidden -O2

Apple M1 macOS 11.0.1 Big Sur Benchmarks



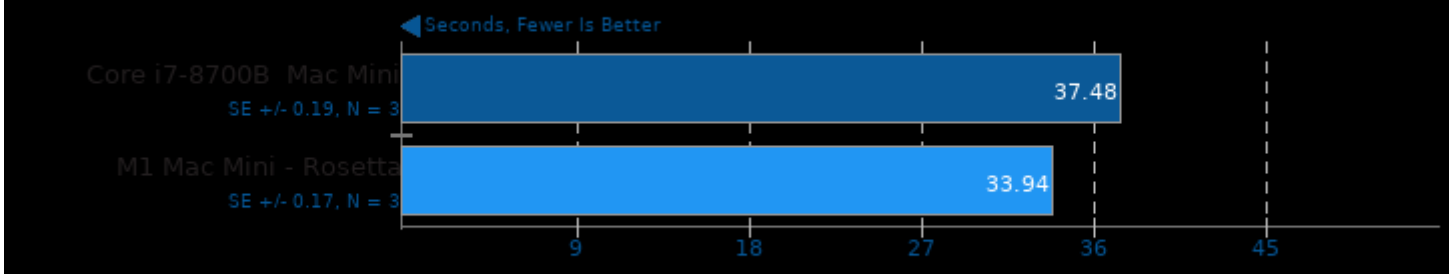
Apple M1 macOS 11.0.1 Big Sur Benchmarks



Apple M1 macOS 11.0.1 Big Sur Benchmarks

Primesieve 7.4

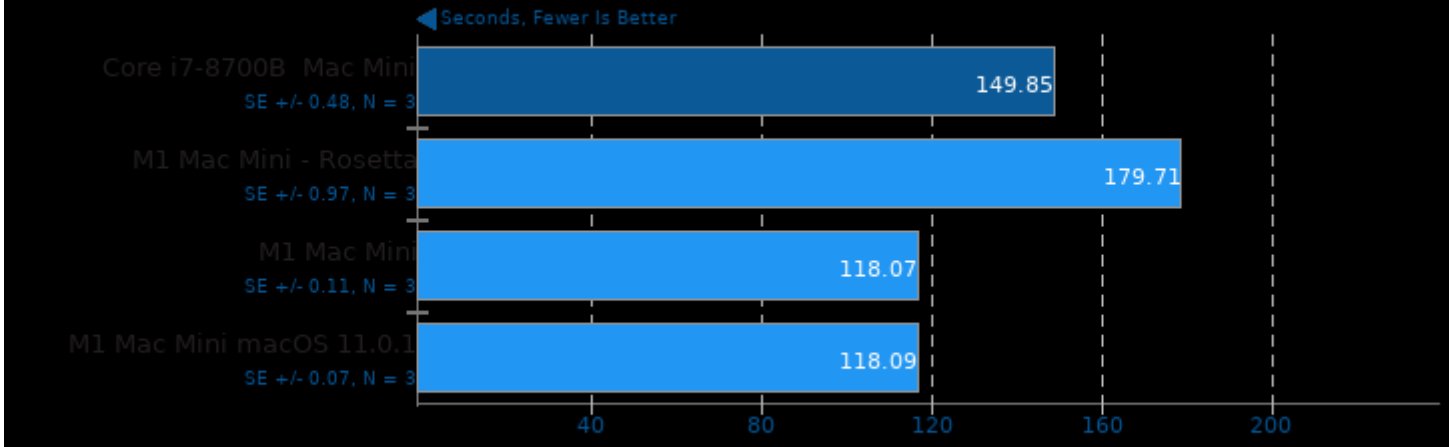
1e12 Prime Number Generation



1. (CXX) g++ options: -O3 -isysroot

Tachyon 0.99b6

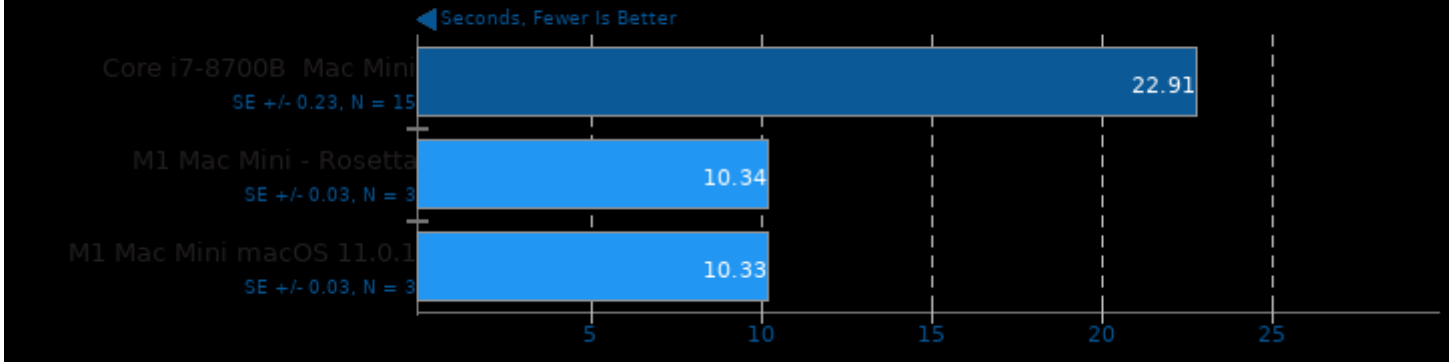
Total Time



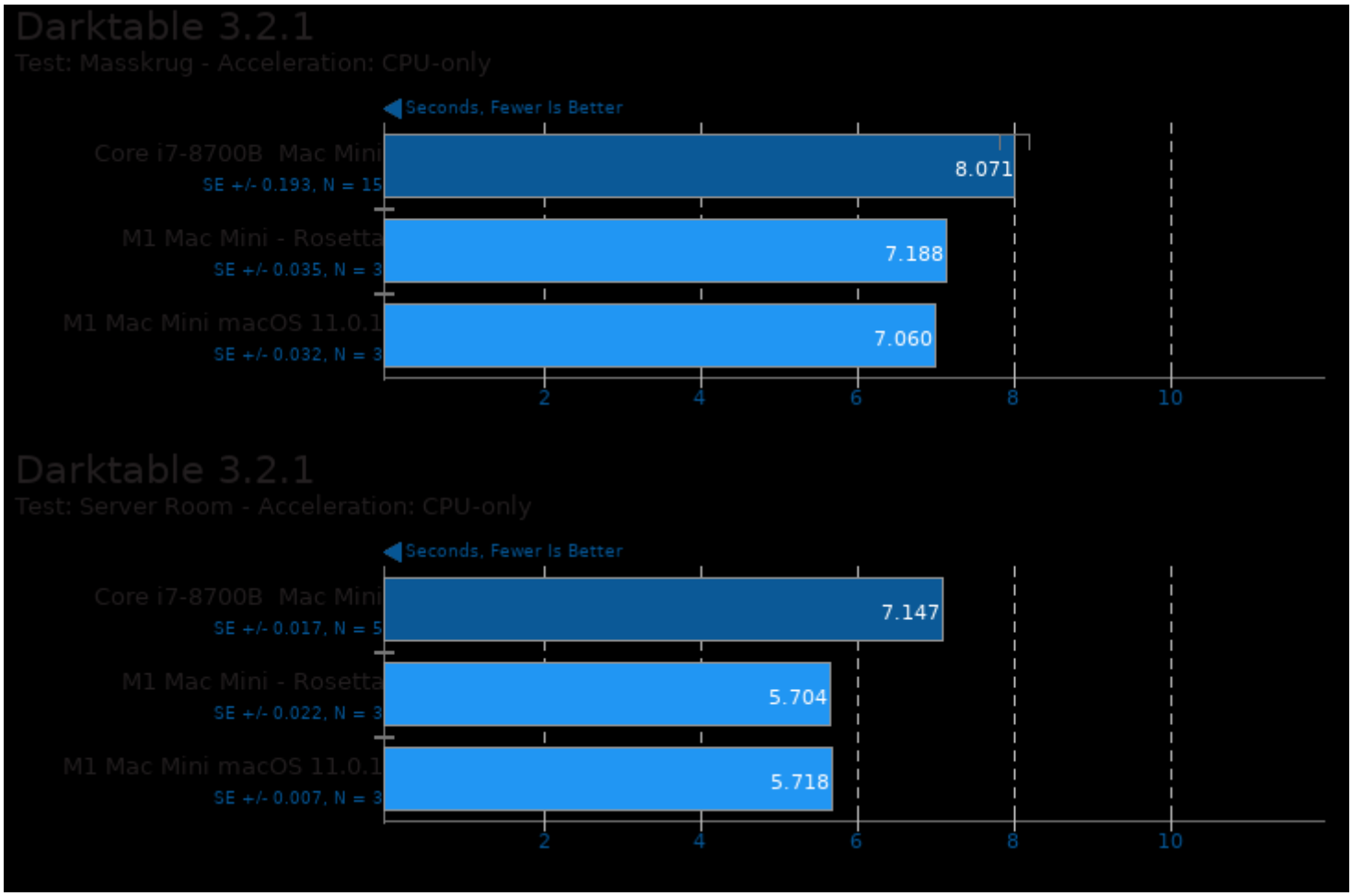
1. (CC) gcc options: -O2 -ffast-math -ltachyon -lpthread

Darktable 3.2.1

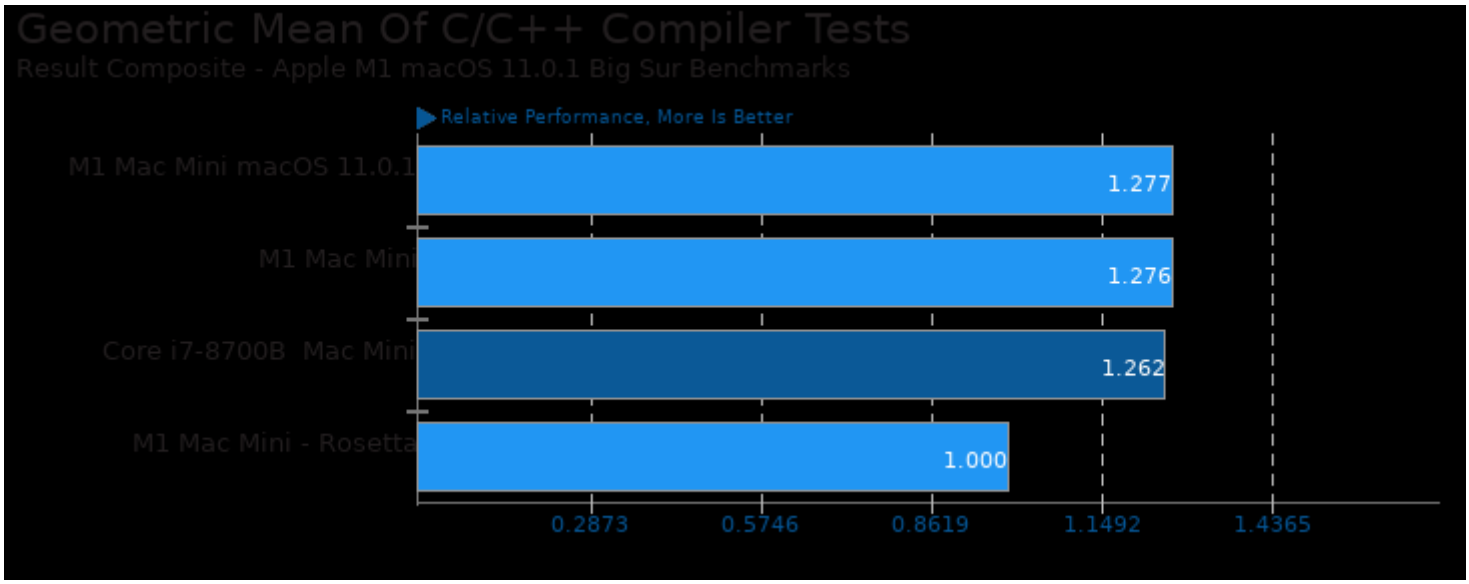
Test: Boat - Acceleration: CPU-only



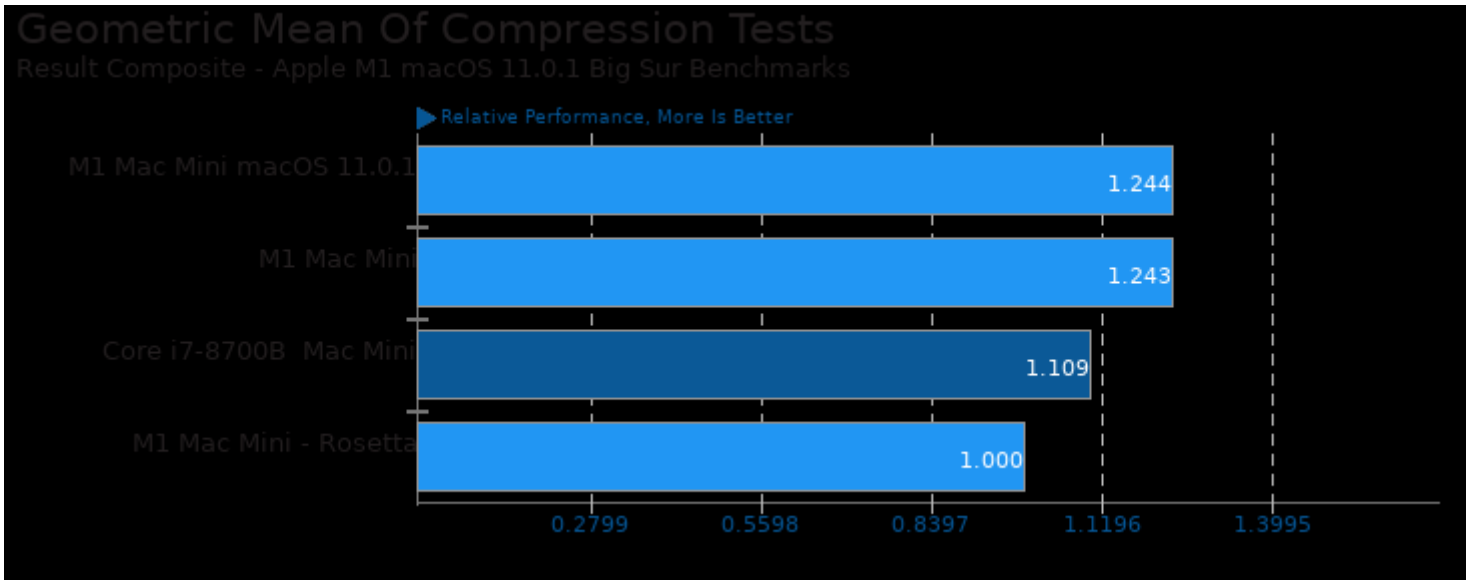
Apple M1 macOS 11.0.1 Big Sur Benchmarks



These geometric means are based upon test groupings / test suites for this result file.

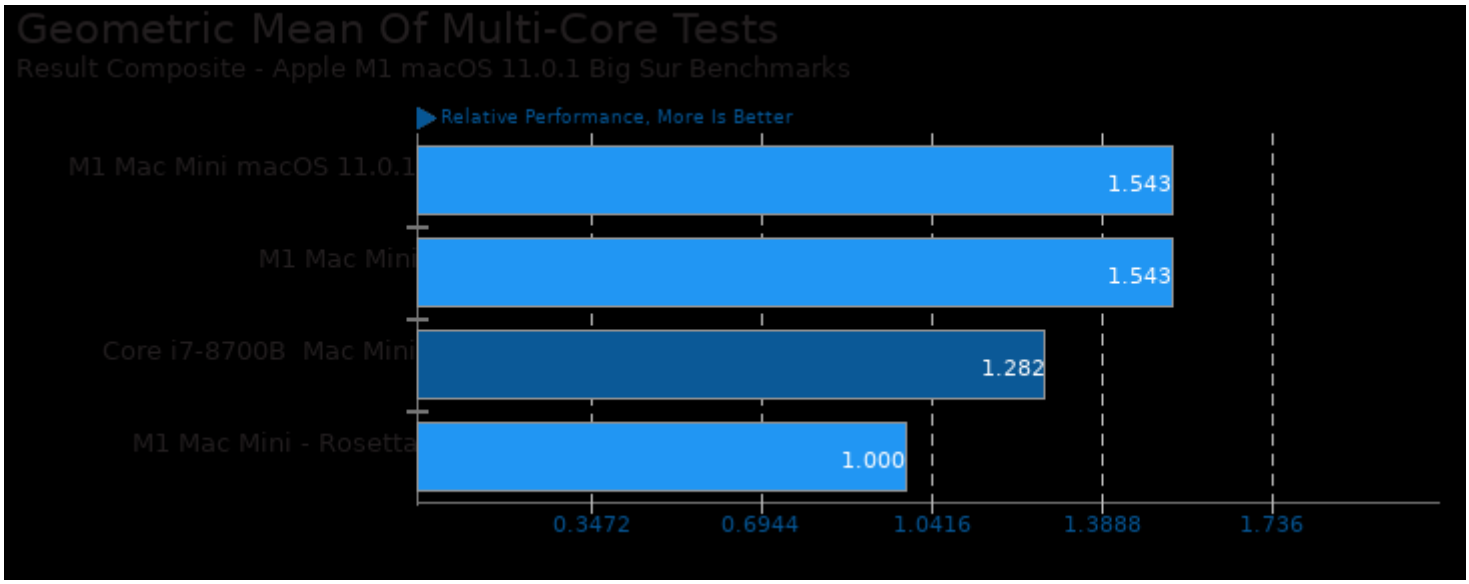


Geometric mean based upon tests: pts/mafft, pts/scimark2, pts/aobench, pts/graphics-magick, pts/stockfish, pts/hmmer, pts/c-ray, pts/compress-7zip, pts/encode-flac, pts/sqlite-speedtest, pts/kvazaar, pts/compress-xz, pts/compress-zstd, pts/tachyon, pts/cryptopp, pts/smhasher, pts/leveldb and pts/basis

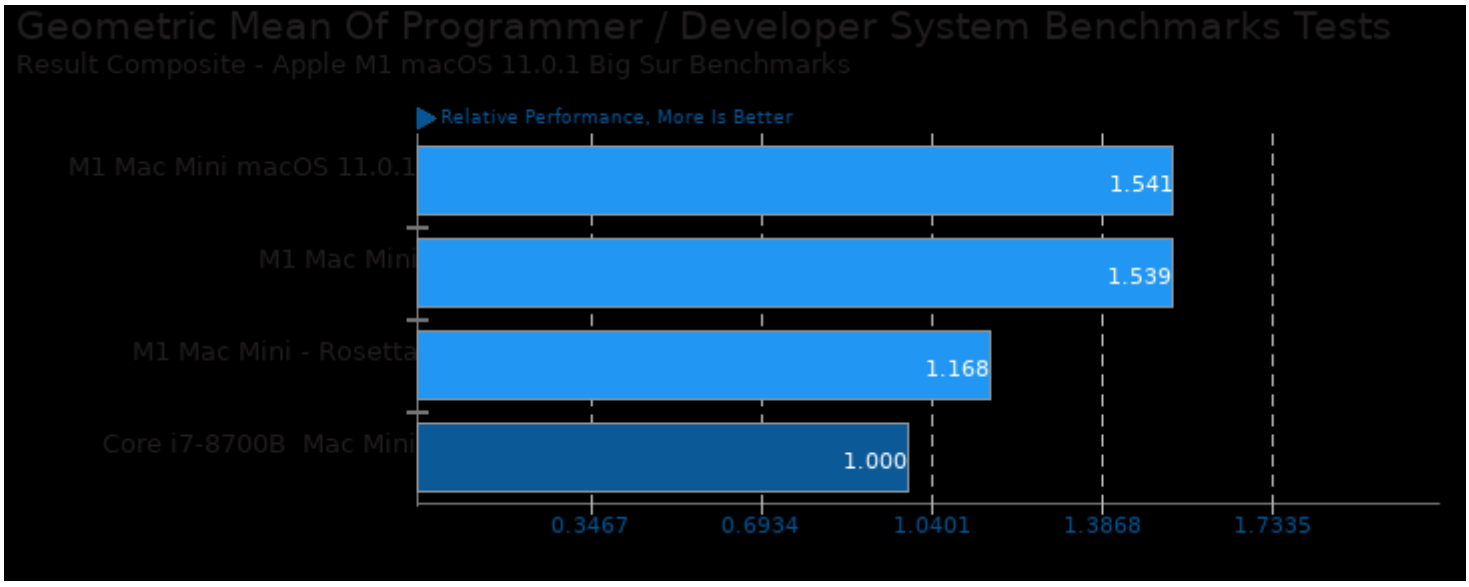


Geometric mean based upon tests: pts/compress-7zip, pts/compress-zstd and pts/compress-xz

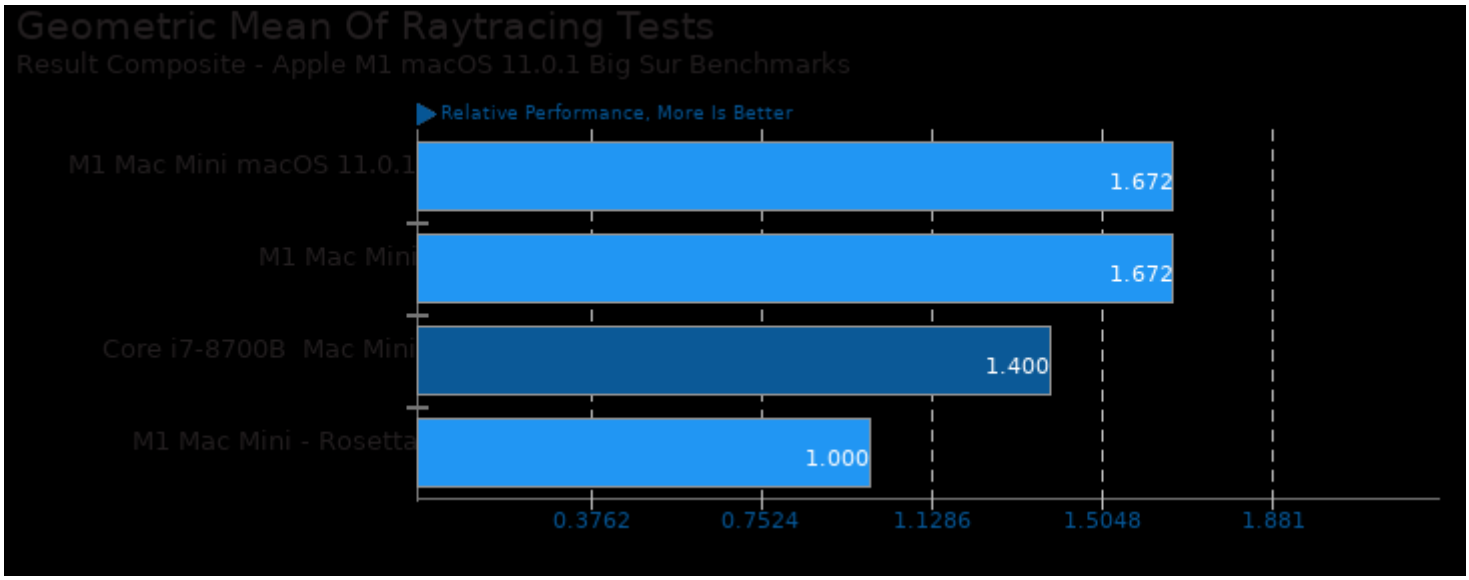
Apple M1 macOS 11.0.1 Big Sur Benchmarks



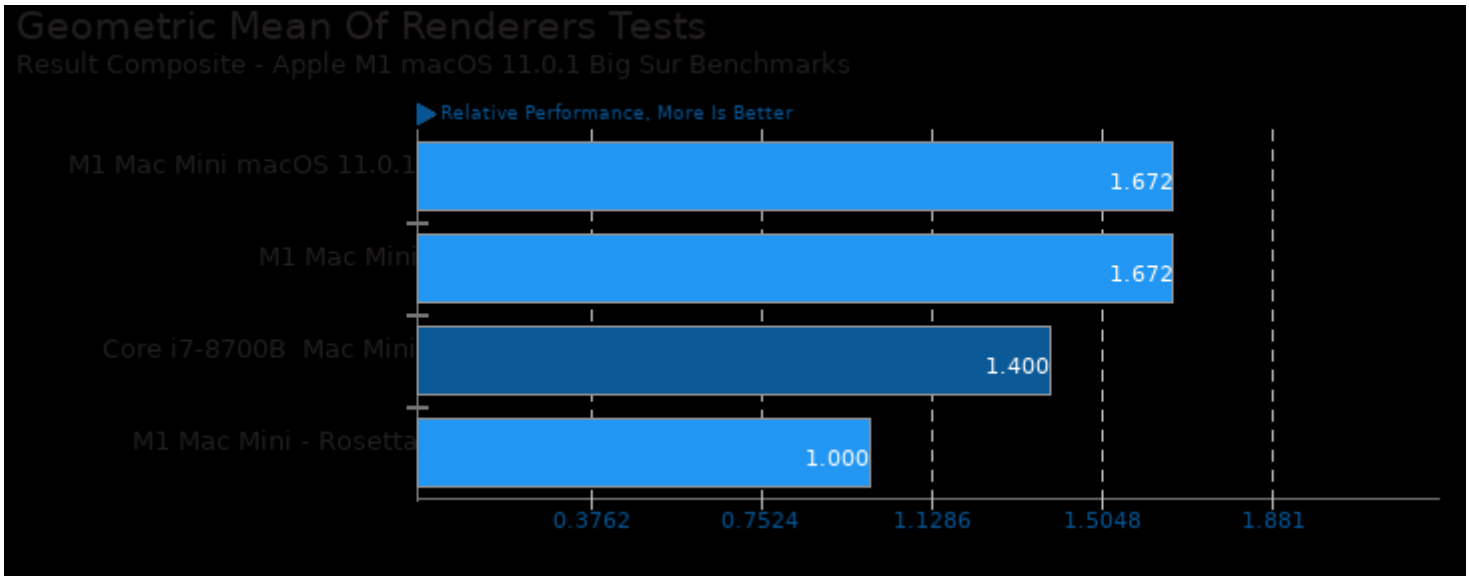
Geometric mean based upon tests: pts/ospray, pts/c-ray, pts/tachyon, pts/stockfish, pts/kvazaar, pts/primesieve, pts/namd, pts/graphics-magick, pts/compress-7zip, pts/compress-zstd, pts/appleseed, pts/aobench, pts/luxcorerender, pts/v-ray, pts/indigobench, pts/embree, pts/oidn and pts/neatbench



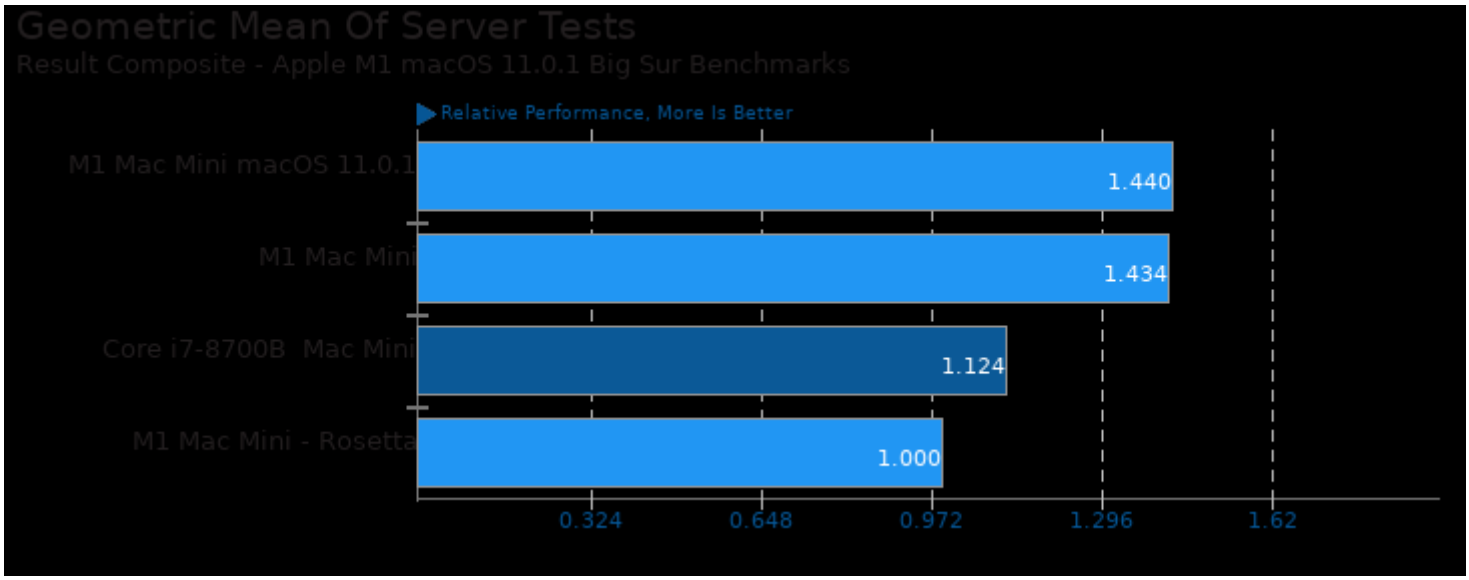
Geometric mean based upon tests: pts/sqlite-speedtest, pts/git, pts/compress-zstd and pts/pybench



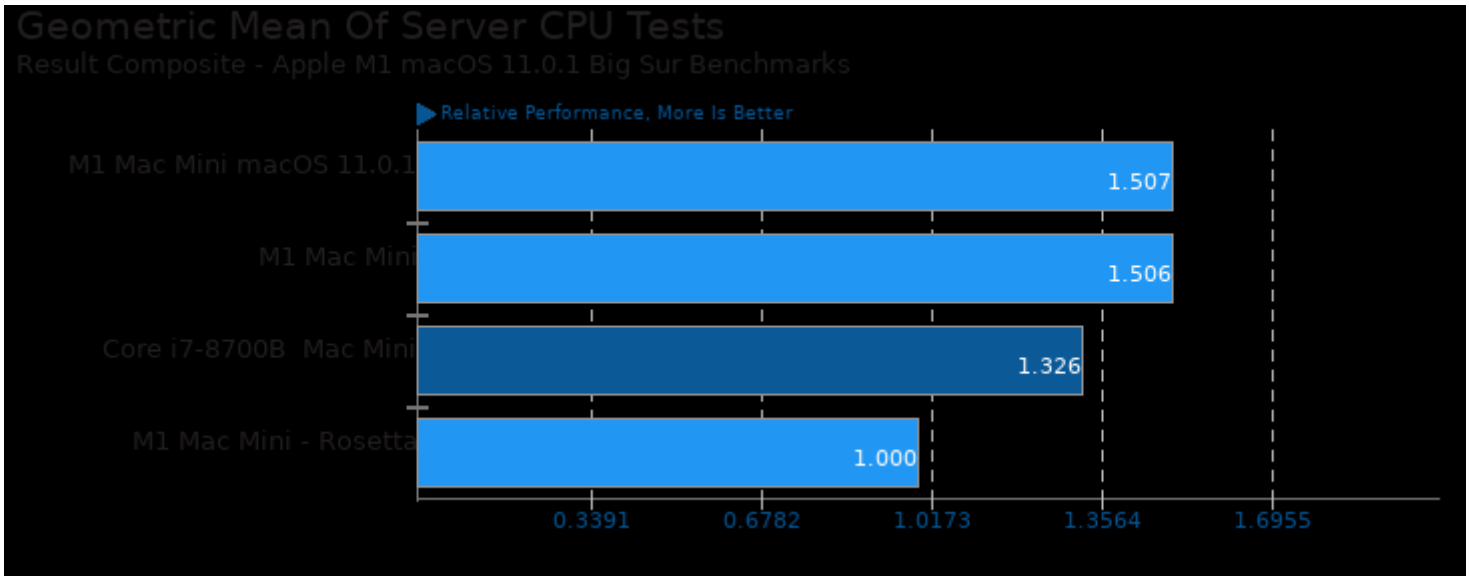
Geometric mean based upon tests: pts/ospray, pts/c-ray and pts/tachyon



Geometric mean based upon tests: pts/ospray, pts/c-ray, pts/tachyon, pts/appleseed, pts/aobench, pts/luxcorerender, pts/v-ray and pts/indigobench

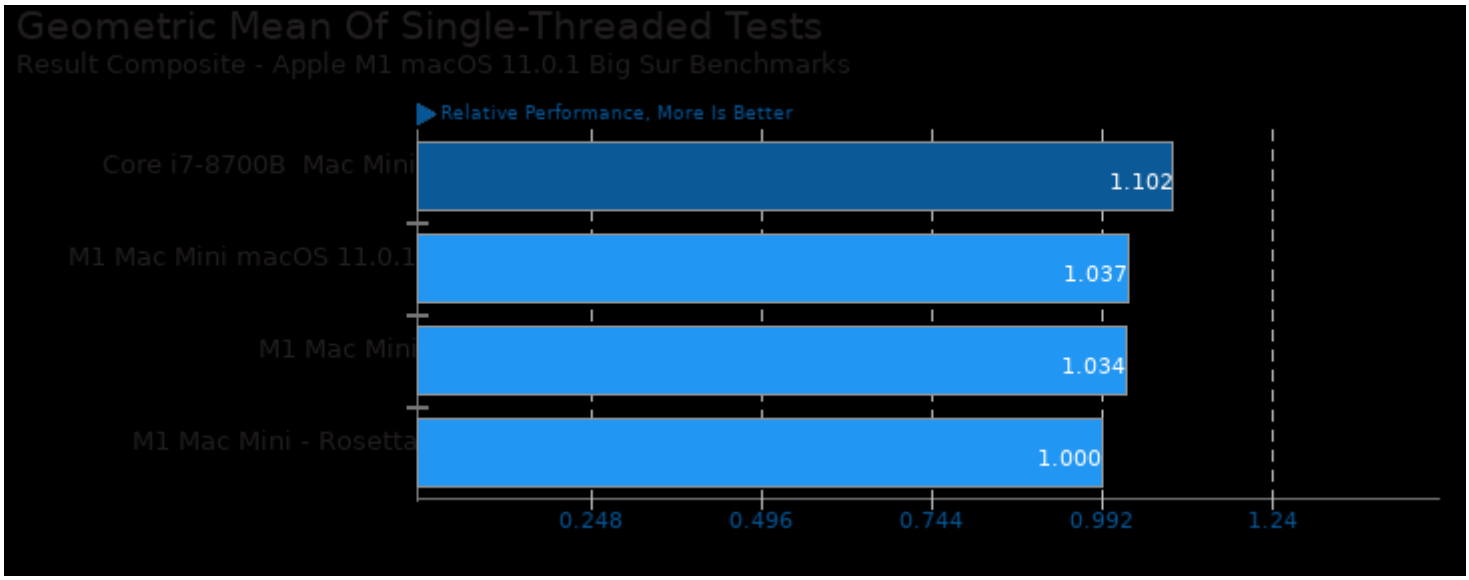


Geometric mean based upon tests: pts/phpbench, pts/sqlite-speedtest and pts/leveldb



Geometric mean based upon tests: pts/namd, pts/renaissance, pts/compress-7zip, pts/stockfish, pts/c-ray, pts/compress-zstd, pts/tjbench, pts/appleseed, pts/pybench, pts/geekbench and pts/phpbench

Apple M1 macOS 11.0.1 Big Sur Benchmarks



Geometric mean based upon tests: pts/java-scimark2, pts/fhourstones, pts/scimark2, pts/botan, pts/encode-flac, pts/tjbench, pts/pybench, pts/phpbench, pts/hint and pts/git

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