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Raspberry Pi 4 vs. Intel Comet Lake

AMD Athlon Silver 3050e

Automated Executive Summary

Core i3 10100 had the most wins, coming in first place for 83% of the tests.

Based on the geometric mean of all complete results, the fastest (Core i3 10100) was 5.137x the speed of the slowest (Raspberry Pi 4). Pentium Gold G6400 was 0.738x the speed of Core i3 10100, Celeron G5900 was 0.776x the speed of Pentium Gold G6400, Lenovo M75n IoT_W10Pro was 0.613x the speed of Celeron G5900, Lenovo M75n IOT_Ubuntu20.10 was 0.815x the speed of Lenovo M75n IoT_W10Pro, Raspberry Pi 4 was 0.679x the speed of Lenovo M75n IOT_Ubuntu20.10.

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

PyPerformance (Benchmark: 2to3) at 734.959x
PyPerformance (Benchmark: pathlib) at 27.263x
GNU Octave Benchmark at 16.278x
PolyBench-C (Test: Covariance Computation) at 14.306x
PolyBench-C (Test: Correlation Computation) at 14.295x
Numpy Benchmark at 14.15x
SQLite Speedtest (Timed Time - Size 1,000) at 14.131x

Aircrack-ng at 13.351x
GraphicsMagick (Operation: Rotate) at 13.341x
FLAC Audio Encoding (WAV To FLAC) at 12.989x.

Test Systems:

Raspberry Pi 4

Processor: ARMv7 Cortex-A72 @ 1.50GHz (4 Cores), Motherboard: BCM2711 Raspberry Pi 4 Model B Rev 1.1, Memory: 2048MB, Disk: 32GB SC32G, Graphics: V3D 4.2 2GB, Monitor: VA2431

OS: Raspbian 10, Kernel: 5.4.51-v7l+ (armv7l), Desktop: LXDE 0.10.0, Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, OpenGL: 2.1 Mesa 19.3.2, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 snd_bcm2835.enable_headphones=1
Compiler Notes: --build=arm-linux-gnueabihf --disable-libitm --disable-libquadmath --disable-libquadmath-support --disable-sjlj-exceptions --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=arm-linux-gnueabihf --program-prefix=arm-linux-gnueabihf- --target=arm-linux-gnueabihf --with-arch=armv6 --with-default-libstdcxx-abi=new --with-float=hard --with-fpu=vfp --with-gcc-major-version-only --with-target-system-zlib -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Java Notes: OpenJDK Runtime Environment (build 11.0.8+10-post-Raspbian-1deb10u1)
Python Notes: Python 2.7.16 + Python 3.7.3

Core i3 10100

Processor: Intel Core i3-10100 @ 4.30GHz (4 Cores / 8 Threads), Motherboard: Gigabyte B460M DS3H (F2 BIOS), Chipset: Intel Device 9b63, Memory: 16GB, Disk: 500GB Western Digital WDS500G3X0C-00SJG0, Graphics: EFI VGA, Audio: Realtek ALC887-VD, Network: Realtek RTL8111/8168/8411

OS: Debian 10, Kernel: 4.19.0-9-amd64 (x86_64), Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xcc
Java Notes: OpenJDK Runtime Environment (build 11.0.8+10-post-Debian-1deb10u1)
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Pentium Gold G6400

Processor: Intel Pentium Gold G6400 @ 4.00GHz (2 Cores / 4 Threads), Motherboard: Gigabyte B460M DS3H (F2 BIOS), Chipset: Intel Device 9b73, Memory: 16GB, Disk: 500GB Western Digital WDS500G3X0C-00SJG0, Graphics: EFI VGA, Audio: Realtek ALC887-VD, Network: Realtek RTL8111/8168/8411

OS: Debian 10, Kernel: 4.19.0-9-amd64 (x86_64), Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xcc
Java Notes: OpenJDK Runtime Environment (build 11.0.8+10-post-Debian-1deb10u1)
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Celeron G5900

Processor: Intel Celeron G5900 @ 3.40GHz (2 Cores), Motherboard: Gigabyte B460M DS3H (F2 BIOS), Chipset: Intel Device 9b73, Memory: 16GB, Disk: 500GB Western Digital WDS500G3X0C-00SJG0, Graphics: EFI VGA, Audio: Realtek ALC887-VD, Network: Realtek RTL8111/8168/8411

OS: Debian 10, Kernel: 4.19.0-9-amd64 (x86_64), Display Server: X Server 1.20.4, Display Driver: modesetting 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xcc
Java Notes: OpenJDK Runtime Environment (build 11.0.8+10-post-Debian-1deb10u1)
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Lenovo M75n IoT_W10Pro

Processor: AMD Athlon Silver 3050e @ 1.40GHz (2 Cores / 4 Threads), Motherboard: LENOVO 3181 (M33KT1AA BIOS), Memory: 1 x 4096 MB 2400MHz 4ATF51264HZ-2G6E1, Disk: 238GB SAMSUNG MZVLB256HBHQ-000L7, Graphics: AMD Radeon Vega 3 512MB, Network: Realtek PCIe GbE + Intel Wireless-AC 9260 160MHz

OS: Microsoft Windows 10 Pro Build 19042, Kernel: 10.0 (x86_64), Display Driver: 27.20.11012.8005, OpenCL: OpenCL 2.1 AMD-APP (3075.12), Compiler: GCC 8.3.0, File-System: NTFS, Screen Resolution: 1920x1080

Java Notes: OpenJDK Runtime Environment 18.9 (build 11.0.6+10-LTS)
Python Notes: Python 3.7.1
Security Notes: __user pointer sanitization: Disabled + Retpoline: Full + IBPB: Always + STIBP: Enabled

Lenovo M75n IOT_Ubuntu20.10

Processor: AMD Athlon Silver 3050e @ 1.40GHz (2 Cores / 4 Threads), Motherboard: LENOVO 3181 (M33KT1AA BIOS), Chipset: AMD Raven/Raven2, Memory: 1 x 4096 MB DDR4-2667MT/s 4ATF51264HZ-2G6E1, Disk: 256GB SAMSUNG MZVLB256HBHQ-000L7, Graphics: AMD Picasso 512MB (1000/1200MHz), Audio: AMD Raven/Raven2/Fenghuang, Monitor: ONA24HB19T01, Network: Realtek RTL8111/8168/8411 + Intel-AC 9260

OS: Ubuntu 20.10, Kernel: 5.8.0-33-generic (x86_64), Desktop: GNOME Shell 3.38.1, Display Server: X Server 1.20.9, Display Driver: amdgpu 19.1.0, OpenGL: 4.6 Mesa 20.2.1 (LLVM 11.0.0), Vulkan: 1.2.131, Compiler: GCC 10.2.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-JvwpWM/gcc-10-10.2.0/debian/tmp-gcn/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64

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--with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8200103
Java Notes: OpenJDK Runtime Environment (build 11.0.9.1+1-Ubuntu-0ubuntu1.20.10)
Python Notes: Python 3.8.6
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full AMD retpoline IBPB: conditional STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	Raspberry Pi 4	Core i3 10100	Pentium Gold G6400	Celeron G5900	Lenovo M75n IoT_W10Pro	Lenovo M75n IOT_Ubuntu20.10
7-Zip Compression - C.S.T (MIPS)	3466	27500	15033	7920	5994	4860
Normalized	12.6%	100%	54.67%	28.8%	21.8%	17.67%
Standard Deviation	0.1%	1.2%	0.2%	0.6%	0.2%	0.9%
Aircrack-ng (k/s)	1162	15519	2813	2347		1565
Normalized	7.49%	100%	18.12%	15.12%		10.09%
Standard Deviation	0.6%	0.4%	0.3%	0%		1.5%
AOBench - 2048 x 2048 - Total Time (sec)	123.692	32.747	35.179	41.546	97.441	63.040
Normalized	26.47%	100%	93.09%	78.82%	33.61%	51.95%
Standard Deviation	0%	0%	0%	2.7%	1.1%	2.6%
C-Ray - Total Time - 4.1.R.P.P (sec)	680.080	157.068	322.191	400.348	529.475	669.486
Normalized	23.1%	100%	48.75%	39.23%	29.66%	23.46%
Standard Deviation	4.3%	0%	0%	0%	0.2%	0.2%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	33031	179882	88892	53412	46082	34830
Normalized	18.36%	100%	49.42%	29.69%	25.62%	19.36%
Standard Deviation	0%	1.1%	1.9%	0.1%	0.4%	1.1%
DaCapo Benchmark - H2 (msec)	14385	3146	3375	3616	7277	8475
Normalized	21.87%	100%	93.21%	87%	43.23%	37.12%
Standard Deviation	3.9%	5.8%	9.7%	2.7%	9.7%	18.1%
DaCapo Benchmark - Jython (msec)	34367	4151	5482	6084	18076	19924
Normalized	12.08%	100%	75.72%	68.23%	22.96%	20.83%
Standard Deviation	2%	1.4%	6%	1.8%	2.9%	0.6%
DaCapo Benchmark - Tradebeans (msec)	21087		4135		13528	15677
Normalized	19.61%		100%		30.57%	26.38%
Standard Deviation	0.7%				5.9%	1.6%
FLAC Audio Encoding - WAV To FLAC (sec)	109.371	8.420	9.456	11.108	15.079	18.062
Normalized	7.7%	100%	89.04%	75.8%	55.84%	46.62%
Standard Deviation	1.1%	0.2%	0.1%	0.1%	0.7%	0.7%
GEGL - Crop (sec)	50.874	8.527	9.509	10.893		17.289
Normalized	16.76%	100%	89.67%	78.28%		49.32%
Standard Deviation	2.7%	0.9%	1.5%	1.1%		1.5%
GEGL - Scale (sec)	36.875	5.478	6.236	7.229		16.275
Normalized	14.86%	100%	87.84%	75.78%		33.66%

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Standard Deviation	0.5%	1.1%	1.3%	0.1%		0.4%
GEGL - Cartoon (sec)	647.548	105.900	117.134	137.544		175.178
Normalized	16.35%	100%	90.41%	76.99%		60.45%
Standard Deviation	0.8%	0.3%	0.3%	0.1%		1.6%
GEGL - Reflect (sec)	14.988	31.140	33.538	39.431		65.898
Normalized	100%	48.13%	44.69%	38.01%		22.74%
Standard Deviation	0.7%	0.4%	0.2%	0.3%		1.1%
GEGL - Antialias (sec)	214.859	40.701	47.341	56.741		86.465
Normalized	18.94%	100%	85.97%	71.73%		47.07%
Standard Deviation	0.5%	0.1%	0.5%	0.1%		4.6%
GEGL - Tile Glass (sec)	161.312	30.744	33.043	38.373		60.610
Normalized	19.06%	100%	93.04%	80.12%		50.72%
Standard Deviation	1.2%	0.2%	0.6%	0.1%		0.3%
GEGL - Wavelet Blur (sec)	326.606	62.372	68.478	79.504		108.098
Normalized	19.1%	100%	91.08%	78.45%		57.7%
Standard Deviation	0.7%	0.3%	0.3%	0%		0.2%
GEGL - Color Enhance (sec)	341.548	59.441	64.276	75.070		104.580
Normalized	17.4%	100%	92.48%	79.18%		56.84%
Standard Deviation	0.5%	0.1%	0.1%	0.1%		0.3%
GEGL - Rotate 90 Degrees (sec)	246.618	41.734	47.592	56.293		93.069
Normalized	16.92%	100%	87.69%	74.14%		44.84%
Standard Deviation	0.3%	0.2%	0.4%	0.1%		1.5%
GIMP - resize (sec)						35.886
Standard Deviation						3%
GIMP - rotate (sec)						28.923
Standard Deviation						2.7%
GIMP - auto-levels (sec)						38.028
Standard Deviation						2.6%
GIMP - unsharp-mask (sec)						41.031
Standard Deviation						2.9%
GIMP - resize (sec)	4.576	8.728	10.648	13.147		
Normalized	100%	52.43%	42.98%	34.81%		
Standard Deviation	23.2%	0.5%	0.1%	1.7%		
GIMP - rotate (sec)	4.389	17.599	18.878	22.125		
Normalized	100%	24.94%	23.25%	19.84%		
Standard Deviation	8.9%	0%	0.2%	0.1%		
GIMP - auto-levels (sec)	4.291	20.780	23.198	27.685		
Normalized	100%	20.65%	18.5%	15.5%		
Standard Deviation	0.5%	0.5%	0.1%	0.1%		
GIMP - unsharp-mask (sec)	4.345	24.968	26.371	31.529		
Normalized	100%	17.4%	16.48%	13.78%		
Standard Deviation	1.9%	0.1%	0.1%	0.1%		
GNU Octave Benchmark	100.389	6.167	6.605	7.633		
Normalized	6.14%	100%	93.37%	80.79%		
Standard Deviation	0.5%	0.4%	1.1%	1%		
GNU Octave Benchmark						18.317
Standard Deviation						0.4%
GraphicsMagick - Swirl (Iterations/min)	34	187	94	65	45	44
Normalized	18.18%	100%	50.27%	34.76%	24.06%	23.53%
Standard Deviation	1.7%	2.5%				9.1%

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GraphicsMagick - Rotate (Iterations/min)	85	1134	1057	873	194	310
Normalized	7.5%	100%	93.21%	76.98%	17.11%	27.34%
Standard Deviation		2.7%	0.1%	0.8%		0.5%
GraphicsMagick - Sharpen (Iterations/min)	15	60	30	25	7	13
Normalized	25%	100%	50%	41.67%	11.67%	21.67%
GraphicsMagick - Enhanced (Iterations/min)	16	92	45	37	21	18
Normalized	17.39%	100%	48.91%	40.22%	22.83%	19.57%
GraphicsMagick - Resizing (Iterations/min)	48	437	246	197	77	92
Normalized	10.98%	100%	56.29%	45.08%	17.62%	21.05%
Standard Deviation		0.3%	0.4%			0.6%
GraphicsMagick - Noise-Gaussian (Iterations/min)	16	117	55	39	21	27
Normalized	13.68%	100%	47.01%	33.33%	17.95%	23.08%
Standard Deviation	25.4%					
GraphicsMagick - HWB Color Space (Iterations/min)	83	933	519	419	125	169
Normalized	8.9%	100%	55.63%	44.91%	13.4%	18.11%
Standard Deviation		0.2%	0.1%	0.1%		
Hugin - P.P.A.S.T (sec)	471.413	68.367	96.509	140.394		216.096
Normalized	14.5%	100%	70.84%	48.7%		31.64%
Standard Deviation	0.4%	0.6%	0.5%	0.2%		0.7%
Inkscape - SVG Files To PNG (sec)	137.212	24.347	25.719	30.616		
Normalized	17.74%	100%	94.67%	79.52%		
Standard Deviation	0.8%	0.1%	0.2%	0.2%		
LAME MP3 Encoding - WAV To MP3 (sec)	41.587	8.122	8.667	10.181	17.119	15.888
Normalized	19.53%	100%	93.71%	79.78%	47.44%	51.12%
Standard Deviation	0.2%	0.1%	0%	0.2%	1.5%	0.7%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	0.499	3.219	1.657	1.381		0.922
Normalized	15.5%	100%	51.48%	42.9%		28.64%
Standard Deviation	0.2%	0.4%	0.6%	0.7%		0.8%
libjpeg-turbo tjbench - D.T (Megapixels/sec)	49.657148	205.777836	172.928584	147.209265	109.047122	96.082578
Normalized	24.13%	100%	84.04%	71.54%	52.99%	46.69%
Standard Deviation	0.4%	0.4%	0.5%	1%	0.4%	0.4%
LibreOffice - 2.D.T.P (sec)	5.751	7.510	8.064	9.739		18.292
Normalized	100%	76.58%	71.32%	59.05%		31.44%
Standard Deviation		2.7%	1.4%	1.8%		2.4%
librsvg - SVG Files To PNG (sec)	77.222	13.551	13.878	16.452		44.248
Normalized	17.55%	100%	97.64%	82.37%		30.63%
Standard Deviation	2.2%	0.3%	0.1%	0.2%		0.4%
Numpy Benchmark (Score)	26.54	375.55	336.12	282.42		114.68
Normalized	7.07%	100%	89.5%	75.2%		30.54%
Standard Deviation	0.1%	0.2%	0.1%	0.4%		0.2%

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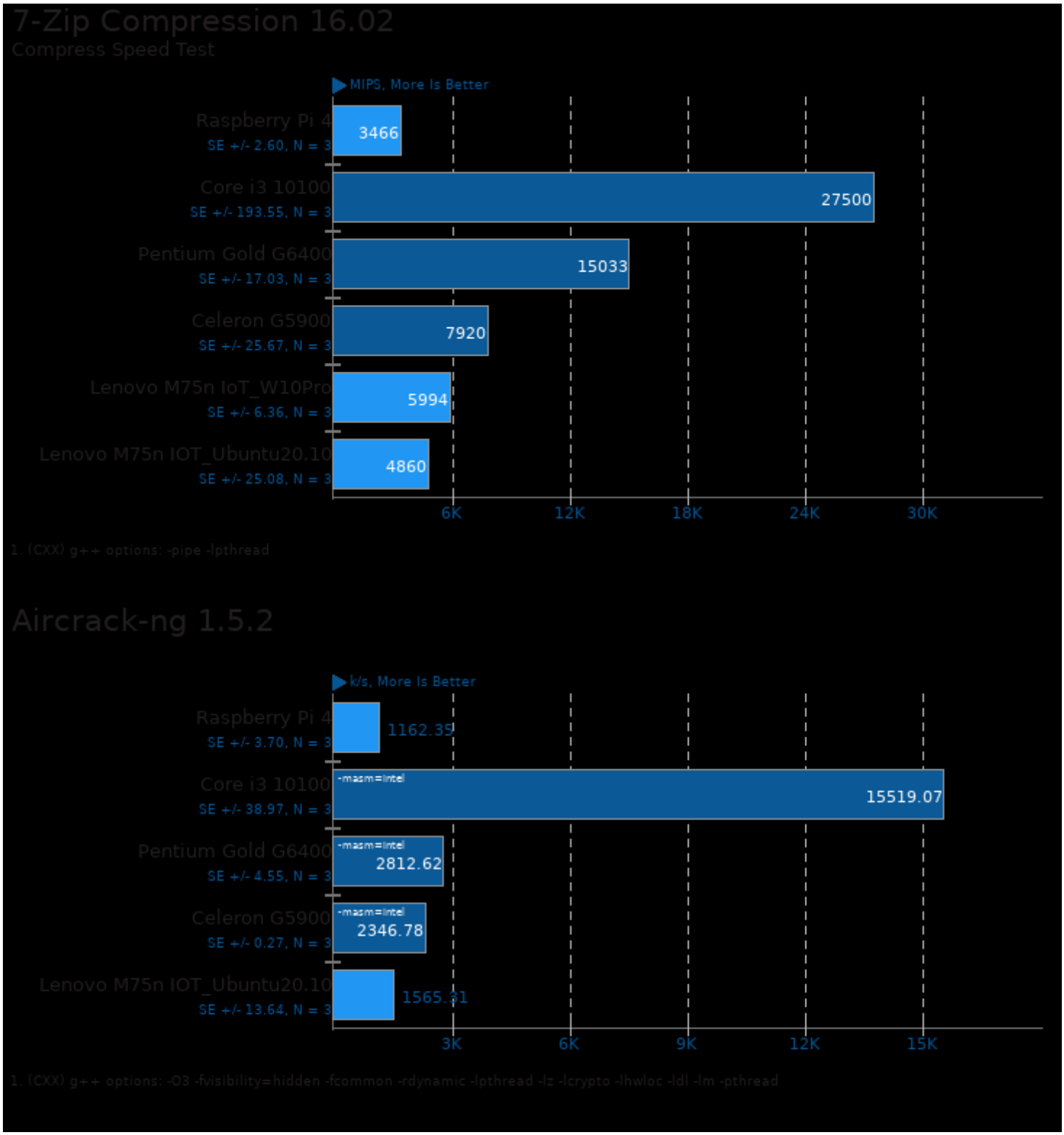
OCRMyPDF - P.6.P.P.D (sec)						176.119
Standard Deviation						1.4%
OCRMyPDF - P.6.P.P.D (sec)	376.428	44.347	89.362	121.326		
Normalized	11.78%	100%	49.63%	36.55%		
Standard Deviation	0.3%	0.1%	0.1%	0.1%		
OpenSSL - R.4.b.P	97.6	1253	389.3	315.0		183.2
Normalized	7.79%	100%	31.06%	25.14%		14.62%
Standard Deviation	0.1%	0.3%	0.1%	0.6%		0.6%
Perl Benchmarks - Pod2html (sec)	0.61497660	0.10872912	0.11884498	0.14005805	0.53120483	0.39327038
Normalized	17.68%	100%	91.49%	77.63%	20.47%	27.65%
Standard Deviation	0.5%	0.2%	0.4%	0.3%	0.9%	0.2%
Perl Benchmarks - Interpreter (sec)	0.00714413	0.00108894	0.00075872	0.00101531	0.02553182	0.00205568
Normalized	10.62%	69.68%	100%	74.73%	2.97%	36.91%
Standard Deviation	6%	22%	0.2%	0.4%	17.9%	1%
PHPBench - P.B.S (Score)	102546	729845	668540	568837	124660	276629
Normalized	14.05%	100%	91.6%	77.94%	17.08%	37.9%
Standard Deviation	0.5%	0.1%	0.3%	0.1%	0.1%	0.3%
PolyBench-C - C.C (sec)	31.015			2.168		6.498
Normalized	6.99%			100%		33.36%
Standard Deviation	0.1%			0.3%		0.9%
PolyBench-C - C.C (sec)	31.021			2.170		6.444
Normalized	7%			100%		33.67%
Standard Deviation	0.1%			0.4%		1.1%
PolyBench-C - 3.M.M (sec)	24.910	3.338	3.832	4.446		7.679
Normalized	13.4%	100%	87.11%	75.08%		43.47%
Standard Deviation	0%	0.1%	0.1%	0.1%		0.7%
PyBench - T.F.A.T.T (Milliseconds)	5235	945	1020	1199	4221	2340
Normalized	18.05%	100%	92.65%	78.82%	22.39%	40.38%
Standard Deviation	0.2%		0.5%	0.5%	0.3%	0.3%
PyPerformance - 2to3 (Milliseconds)	1.79	304	328	397	1.23	904
Normalized	68.72%	0.4%	0.38%	0.31%	100%	0.14%
Standard Deviation	0%				17.9%	0.1%
PyPerformance - float (Milliseconds)	629	95.7	104	123	418	325
Normalized	15.21%	100%	92.02%	77.8%	22.89%	29.45%
Standard Deviation		0.1%			0.7%	
PyPerformance - pathlib (Milliseconds)	142	17.9	19.5	23.6	488	50.8
Normalized	12.61%	100%	91.79%	75.85%	3.67%	35.24%
Standard Deviation		0%	0.3%	0%	21.6%	0.6%
PyPerformance - json_loads (Milliseconds)	144	23.6	25.5	30.1	82.2	59.7
Normalized	16.39%	100%	92.55%	78.41%	28.71%	39.53%
Standard Deviation	0.7%	0.2%	0.2%	0.2%	0.2%	0.6%
PyPerformance - regex_compile	962	167	180	212	594	462
Normalized	17.36%	100%	92.78%	78.77%	28.11%	36.15%
Standard Deviation	0.1%					0.3%

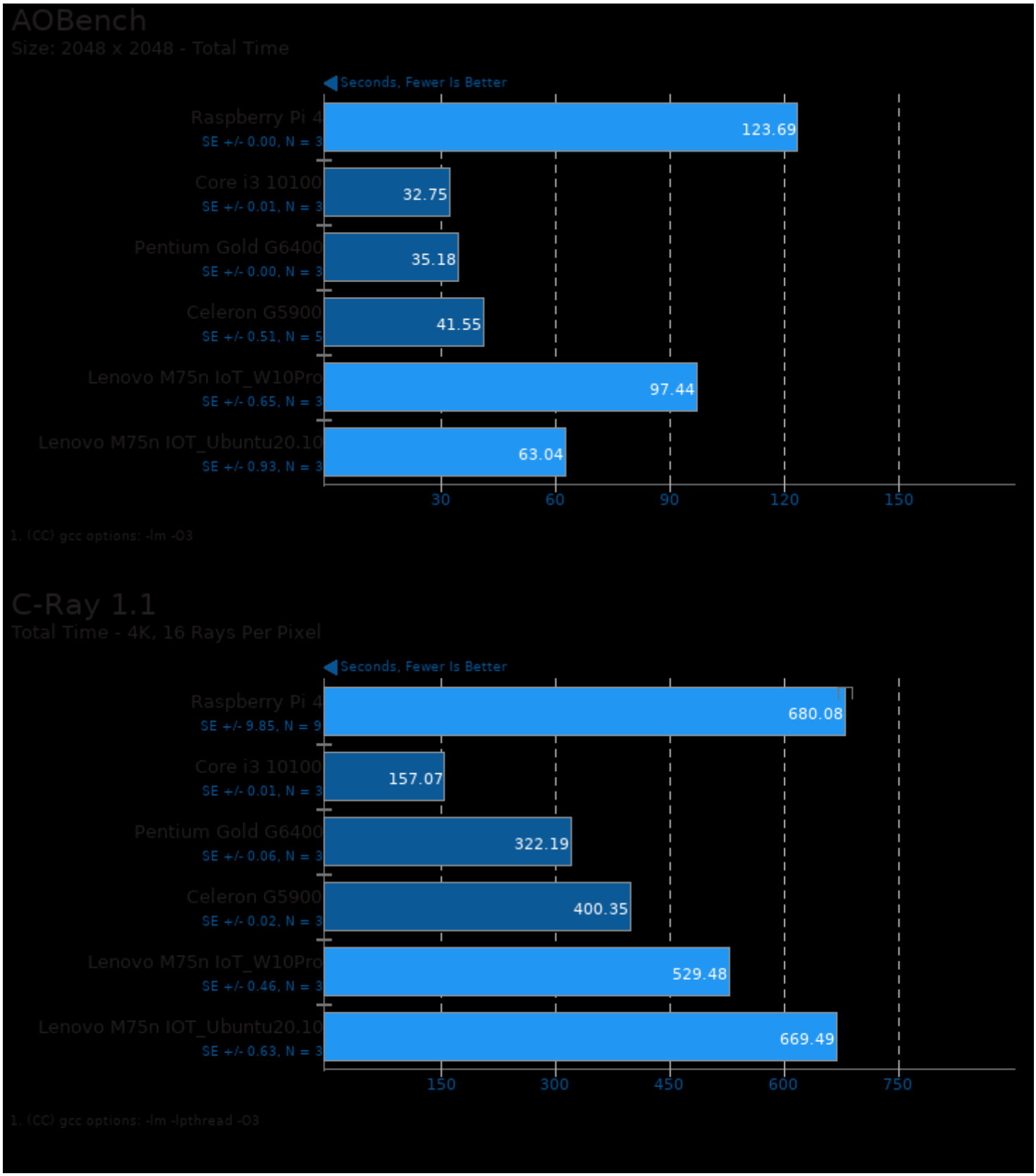
Raspberry Pi 4 vs. Intel Comet Lake

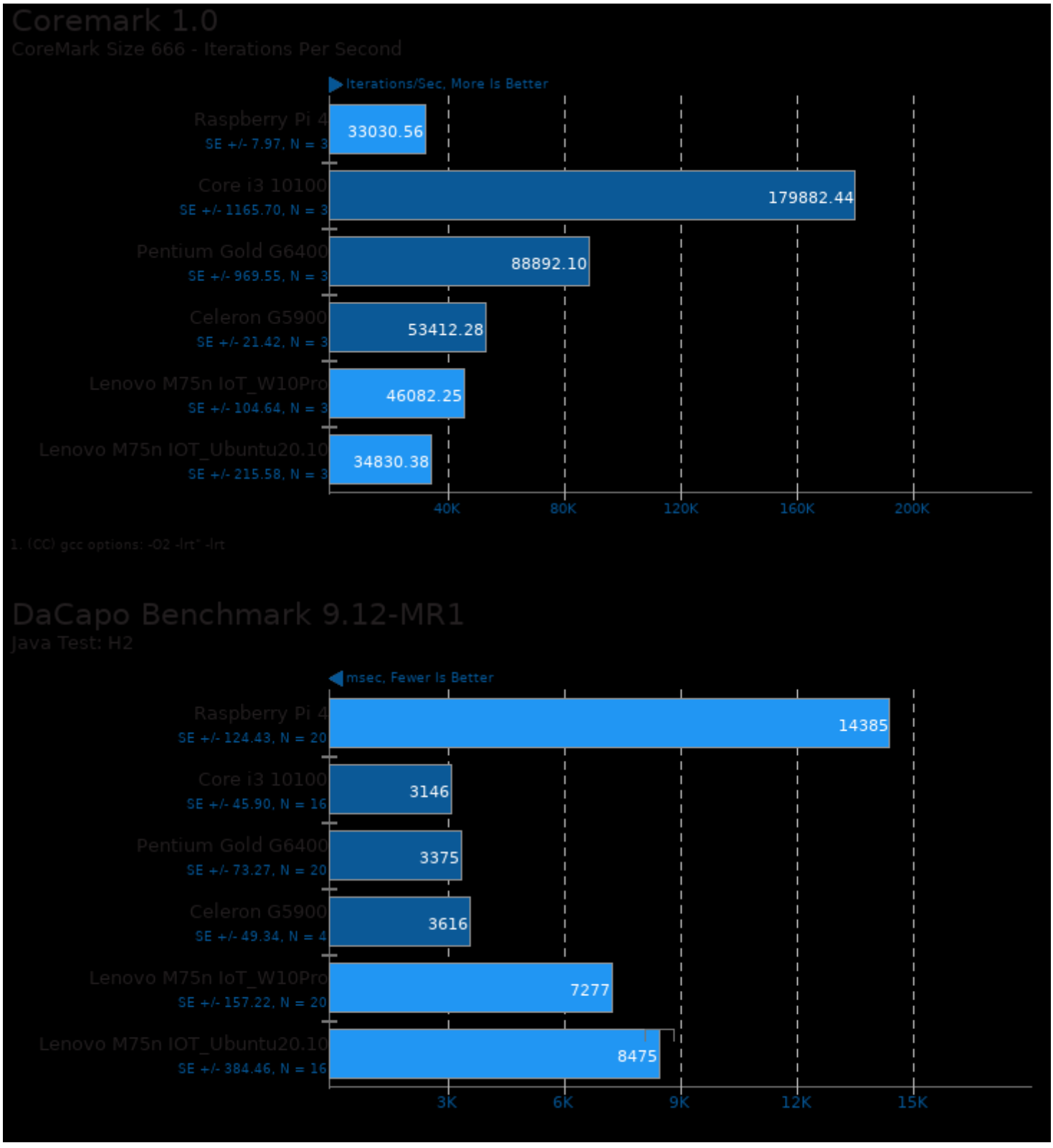
PyPerformance - python_startup	42.5	**7.49**	7.96	9.8	**62.7**	19.1
Normalized	17.62%	100%	94.1%	76.43%	11.95%	39.21%
Standard Deviation	0.1%	0.2%	0%	0%	17.5%	0%
RawTherapee - T.B.T (sec)	**748.022**	**104.108**	147.977	213.383		370.983
Normalized	13.92%	100%	70.35%	48.79%		28.06%
Standard Deviation	0.3%	0%	0%	0.1%		0.1%
Scikit-Learn (sec)	**79.112**	**27.067**	29.554	34.693		50.929
Normalized	34.21%	100%	91.58%	78.02%		53.15%
Standard Deviation	0.4%	0.3%	0.1%	0.1%		0.9%
Smallpt - G.I.R.1.S (sec)	130.180	**22.802**	46.453	74.585	**134.029**	115.487
Normalized	17.52%	100%	49.09%	30.57%	17.01%	19.74%
Standard Deviation	1.4%	0.1%	0.1%	0.1%	0.3%	0.4%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**766.550**	**54.246**	65.150	82.015		183.248
Normalized	7.08%	100%	83.26%	66.14%		29.6%
Standard Deviation	0.5%	0.6%	2.3%	0%		0.1%
Tesseract OCR - T.T.O.7.I (sec)	**136.504**	**25.010**	30.871	54.798		
Normalized	18.32%	100%	81.01%	45.64%		
Standard Deviation	0.1%	0.2%	0.1%	0%		
Tesseract OCR - T.T.O.7.I (sec)						**60.025**
Normalized						100%
Standard Deviation						0.1%
Tesseract OCR - T.T.O.7.I (sec)					114.171	
Standard Deviation					0.1%	
Timed Apache Compilation - Time To Compile (sec)	**180.753**	**24.444**	37.116	54.742		143.195
Normalized	13.52%	100%	65.86%	44.65%		17.07%
Standard Deviation	0.6%	0.2%	0.1%	0.1%		0.1%
Timed GDB GNU Debugger Compilation - Time To Compile (sec)	**970.537**	**118.874**	178.803	274.528		838.912
Normalized	12.25%	100%	66.48%	43.3%		14.17%
Standard Deviation	0.5%	0.3%	0.1%	0.1%		16.3%
Timed HMMer Search - P.D.S (sec)	**53.889**	**7.438**	12.846	19.579		45.432
Normalized	13.8%	100%	57.9%	37.99%		16.37%
Standard Deviation	1.4%	1.5%	0.9%	0.2%		0.1%
Timed MAFFT Alignment - M.S.A (sec)	**22.514**	**3.855**	6.593	9.417		
Normalized	17.12%	100%	58.47%	40.94%		
Standard Deviation	3%	6.6%	1.2%	0.4%		
Timed MPlayer Compilation - Time To Compile (sec)	**543.837**	**69.218**	128.701	198.335		515.444
Normalized	12.73%	100%	53.78%	34.9%		13.43%
Standard Deviation	0%	0.1%	0%	0.1%		0.5%
Timed PHP Compilation - Time To Compile (sec)	**638.584**	**88.578**	143.935	220.076		540.948
Normalized	13.87%	100%	61.54%	40.25%		16.37%
Standard Deviation	0.2%	0.2%	0.1%	0.3%		0.5%

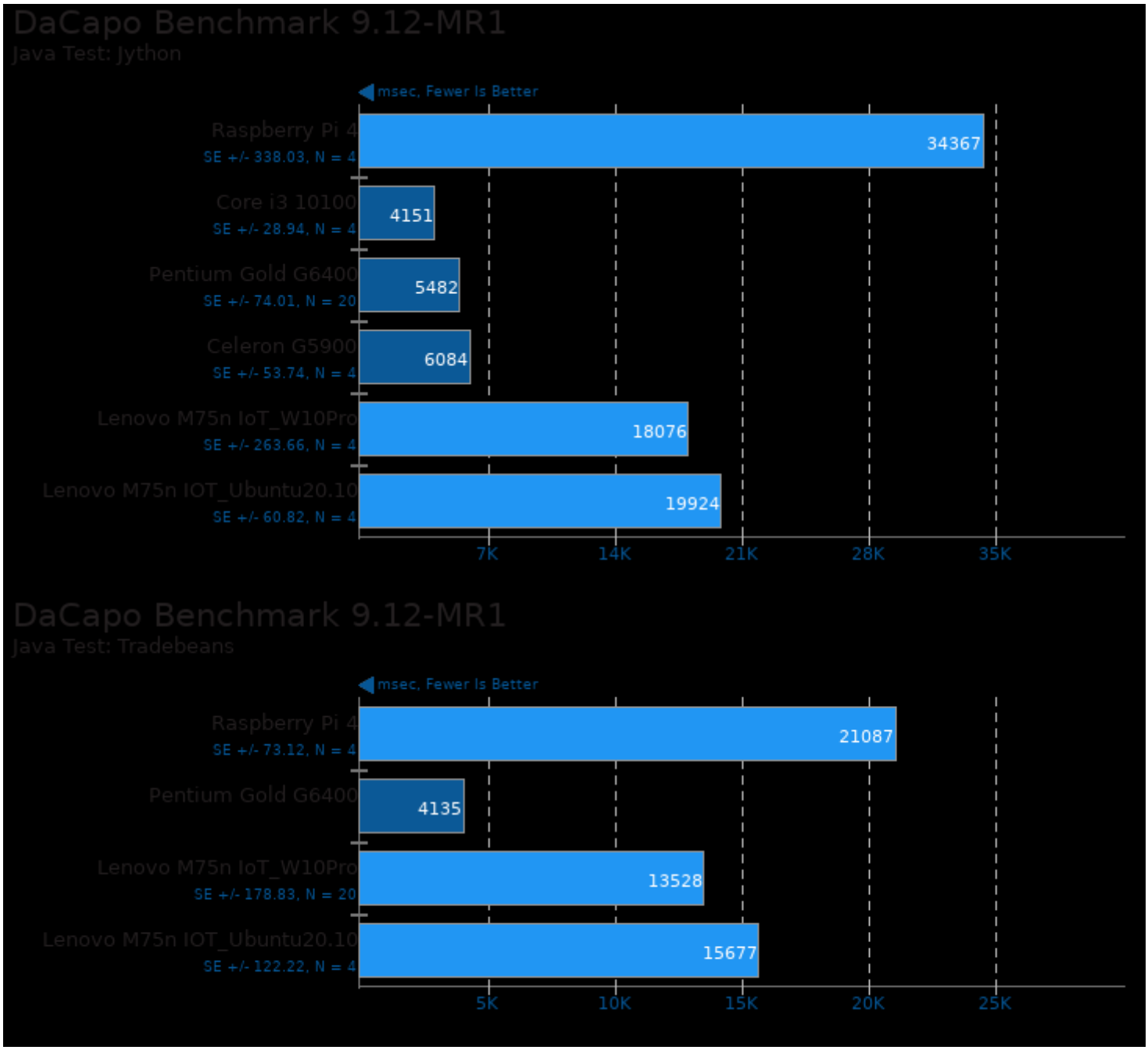
Raspberry Pi 4 vs. Intel Comet Lake

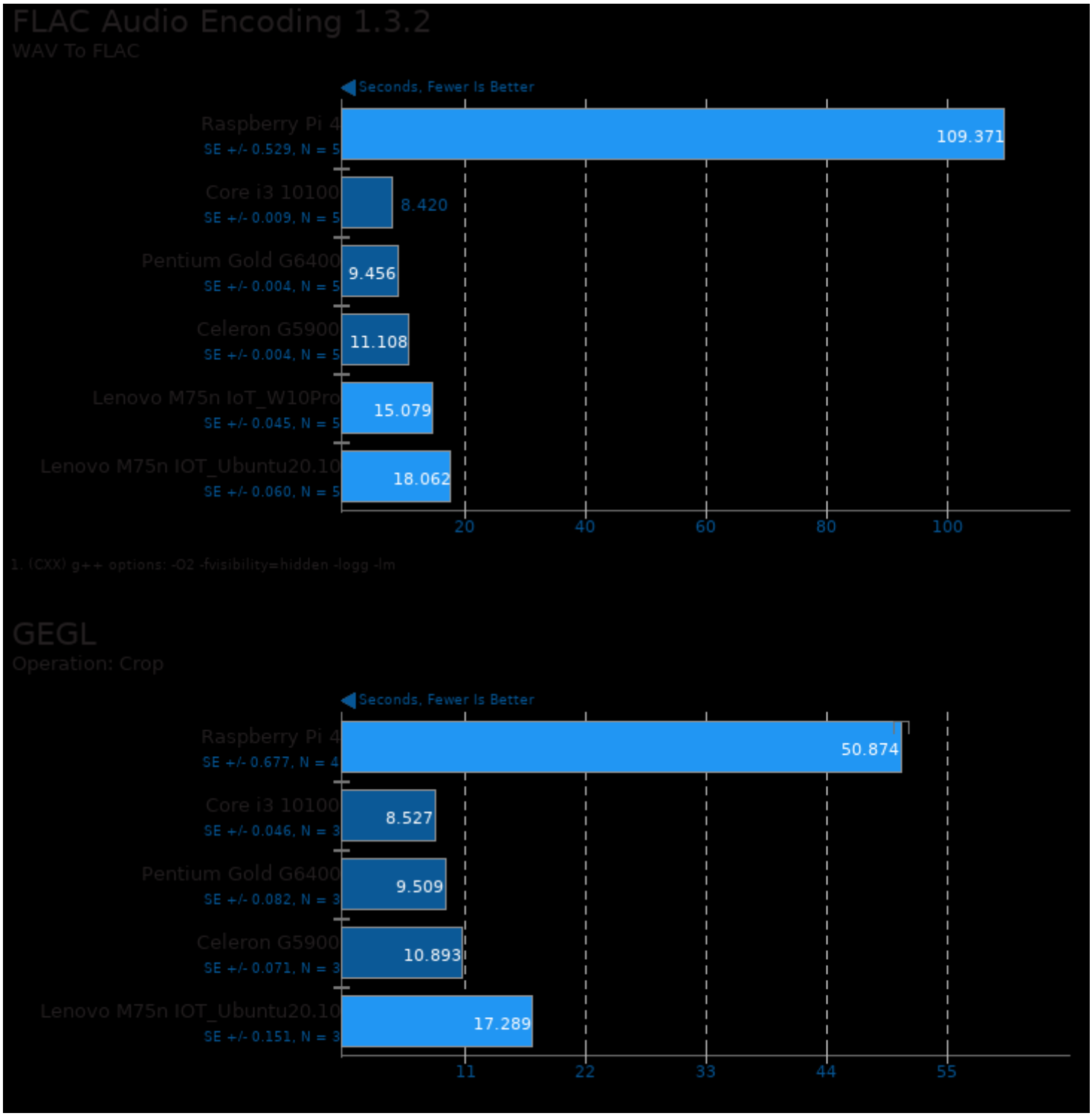
TSCP - A.C.P (Nodes/s)	**350771**	**1376258**	1268492	1078690	618371	619358
Normalized	25.49%	100%	92.17%	78.38%	44.93%	45%
Standard Deviation	0.2%	0.1%	0.2%	0.2%	1.2%	1.3%
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	**25.4479**	**262.097**	132.556	76.4398		54.6706
Normalized	9.71%	100%	50.58%	29.16%		20.86%
Standard Deviation	0.7%	0.3%	0.9%	0.3%		0.4%
XZ Compression - C.u.1.0.3.s.i.i.C.L.9 (sec)	**416.907**	**42.488**	69.307	123.883	197.469	223.469
Normalized	10.19%	100%	61.3%	34.3%	21.52%	19.01%
Standard Deviation	2.8%	0.3%	0.4%	0.1%	0.1%	0.6%

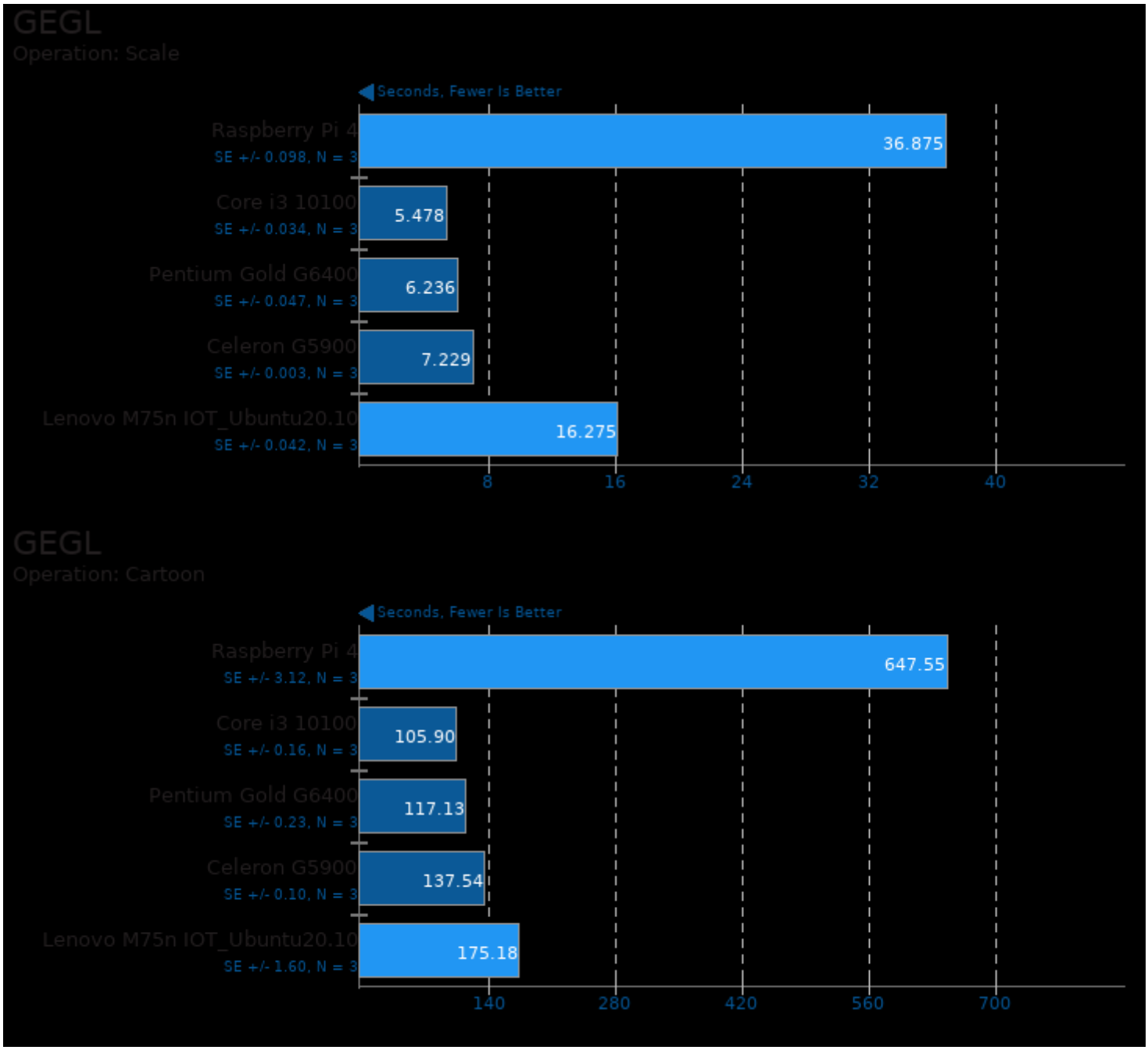

7-Zip Compression 16.02
Compress Speed Test
MIPS, More Is Better
Raspberry Pi 4
SE +/- 2.60, N = 3
3466
Core i3 10100
SE +/- 193.55, N = 3
27500
Pentium Gold G6400
SE +/- 17.03, N = 3
15033
Celeron G5900
SE +/- 25.67, N = 3
7920
Lenovo M75n IoT_W10Pro
SE +/- 6.36, N = 3
5994
Lenovo M75n IOT_Ubuntu20.10
SE +/- 25.08, N = 3
4860
6K
12K
18K
24K
30K
1. (CXX) g++ options: -pipe -lpthread
Aircrack-ng 1.5.2
k/s, More Is Better
Raspberry Pi 4
SE +/- 3.70, N = 3
1162.35
Core i3 10100
SE +/- 38.97, N = 3
-masm=intel
15519.07
Pentium Gold G6400
SE +/- 4.55, N = 3
-masm=intel
2812.62
Celeron G5900
SE +/- 0.27, N = 3
-masm=intel
2346.78
Lenovo M75n IOT_Ubuntu20.10
SE +/- 13.64, N = 3
1565.31
3K
6K
9K
12K
15K
1. (CXX) g++ options: -O3 -fvisibility=hidden -fcommon -rdynamic -lpthread -lz -lcrypto -lhwloc -ldl -lm -pthread

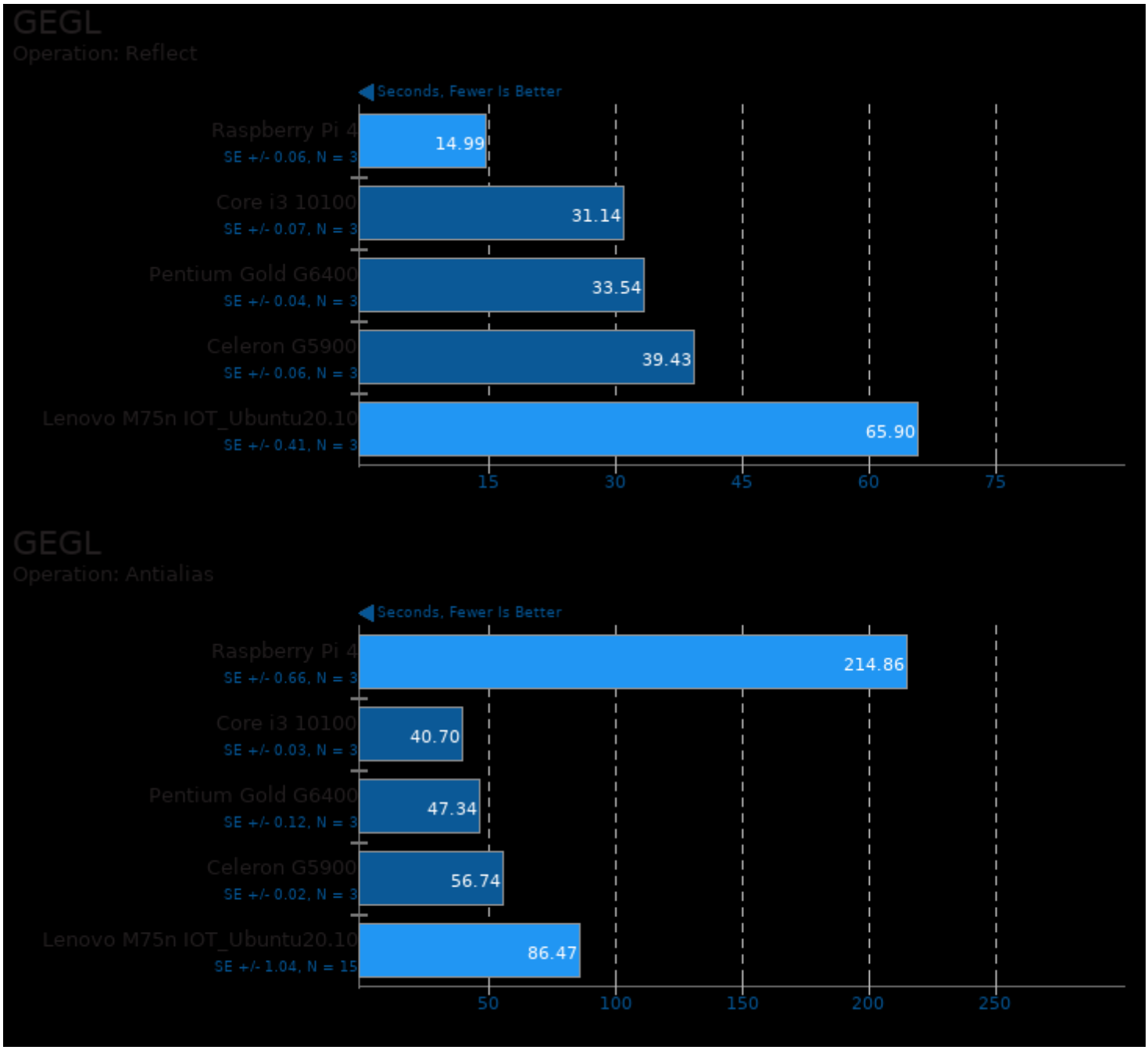

AOBench
Size: 2048 x 2048 - Total Time
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.00, N = 3
123.69
Core i3 10100
SE +/- 0.01, N = 3
32.75
Pentium Gold G6400
SE +/- 0.00, N = 3
35.18
Celeron G5900
SE +/- 0.51, N = 5
41.55
Lenovo M75n IoT_W10Pro
SE +/- 0.65, N = 3
97.44
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.93, N = 3
63.04
30
60
90
120
150
1. (CC) gcc options: -lm -O3
C-Ray 1.1
Total Time - 4K, 16 Rays Per Pixel
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 9.85, N = 9
680.08
Core i3 10100
SE +/- 0.01, N = 3
157.07
Pentium Gold G6400
SE +/- 0.06, N = 3
322.19
Celeron G5900
SE +/- 0.02, N = 3
400.35
Lenovo M75n IoT_W10Pro
SE +/- 0.46, N = 3
529.48
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.63, N = 3
669.49
150
300
450
600
750
1. (CC) gcc options: -lm -lpthread -O3

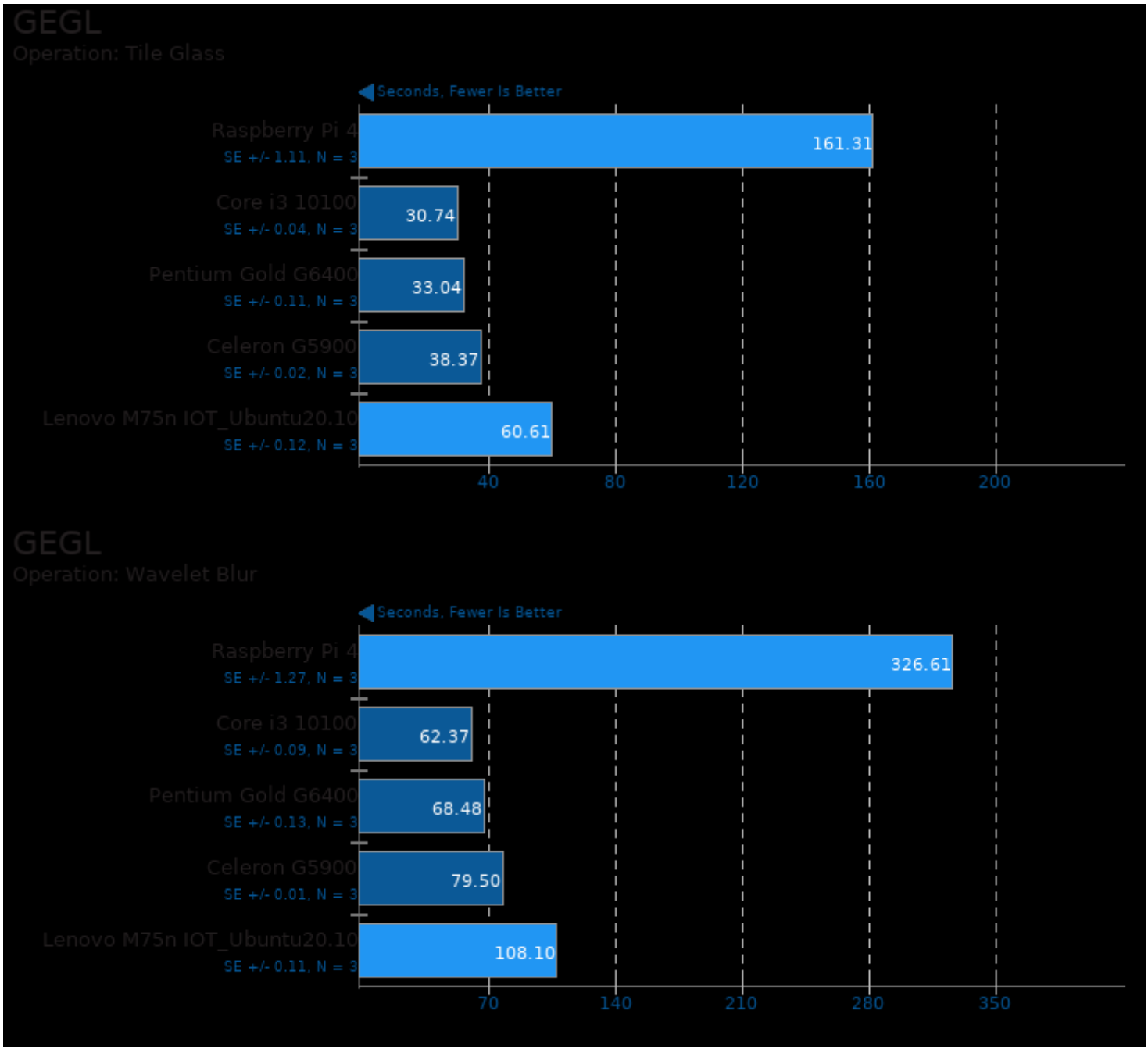

Coremark 1.0
CoreMark Size 666 - Iterations Per Second
Iterations/Sec, More Is Better
Raspberry Pi 4
SE +/- 7.97, N = 3
33030.56
Core i3 10100
SE +/- 1165.70, N = 3
179882.44
Pentium Gold G6400
SE +/- 969.55, N = 3
88892.10
Celeron G5900
SE +/- 21.42, N = 3
53412.28
Lenovo M75n IoT_W10Pro
SE +/- 104.64, N = 3
46082.25
Lenovo M75n IOT_Ubuntu20.10
SE +/- 215.58, N = 3
34830.38
40K
80K
120K
160K
200K
1. (CC) gcc options: -O2 -lrt" -lrt
DaCapo Benchmark 9.12-MR1
Java Test: H2
msec, Fewer Is Better
Raspberry Pi 4
SE +/- 124.43, N = 20
14385
Core i3 10100
SE +/- 45.90, N = 16
3146
Pentium Gold G6400
SE +/- 73.27, N = 20
3375
Celeron G5900
SE +/- 49.34, N = 4
3616
Lenovo M75n IoT_W10Pro
SE +/- 157.22, N = 20
7277
Lenovo M75n IOT_Ubuntu20.10
SE +/- 384.46, N = 16
8475
3K
6K
9K
12K
15K

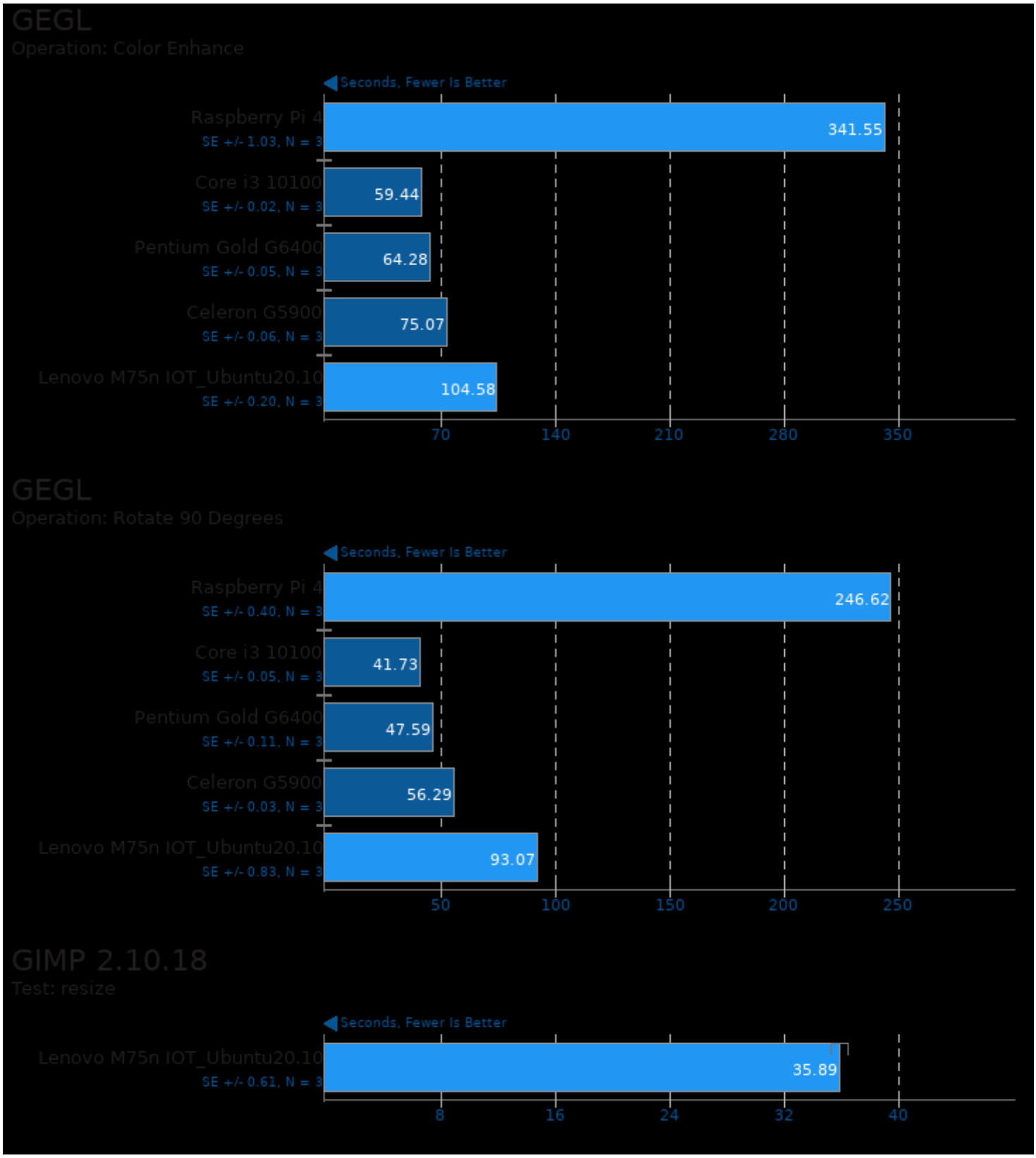

DaCapo Benchmark 9.12-MR1
Java Test: Jython
msec, Fewer Is Better
Raspberry Pi 4
SE +/- 338.03, N = 4
34367
Core i3 10100
SE +/- 28.94, N = 4
4151
Pentium Gold G6400
SE +/- 74.01, N = 20
5482
Celeron G5900
SE +/- 53.74, N = 4
6084
Lenovo M75n IoT_W10Pro
SE +/- 263.66, N = 4
18076
Lenovo M75n IOT_Ubuntu20.10
SE +/- 60.82, N = 4
19924
7K
14K
21K
28K
35K
DaCapo Benchmark 9.12-MR1
Java Test: Tradebeans
msec, Fewer Is Better
Raspberry Pi 4
SE +/- 73.12, N = 4
21087
Pentium Gold G6400
4135
Lenovo M75n IoT_W10Pro
SE +/- 178.83, N = 20
13528
Lenovo M75n IOT_Ubuntu20.10
SE +/- 122.22, N = 4
15677
5K
10K
15K
20K
25K

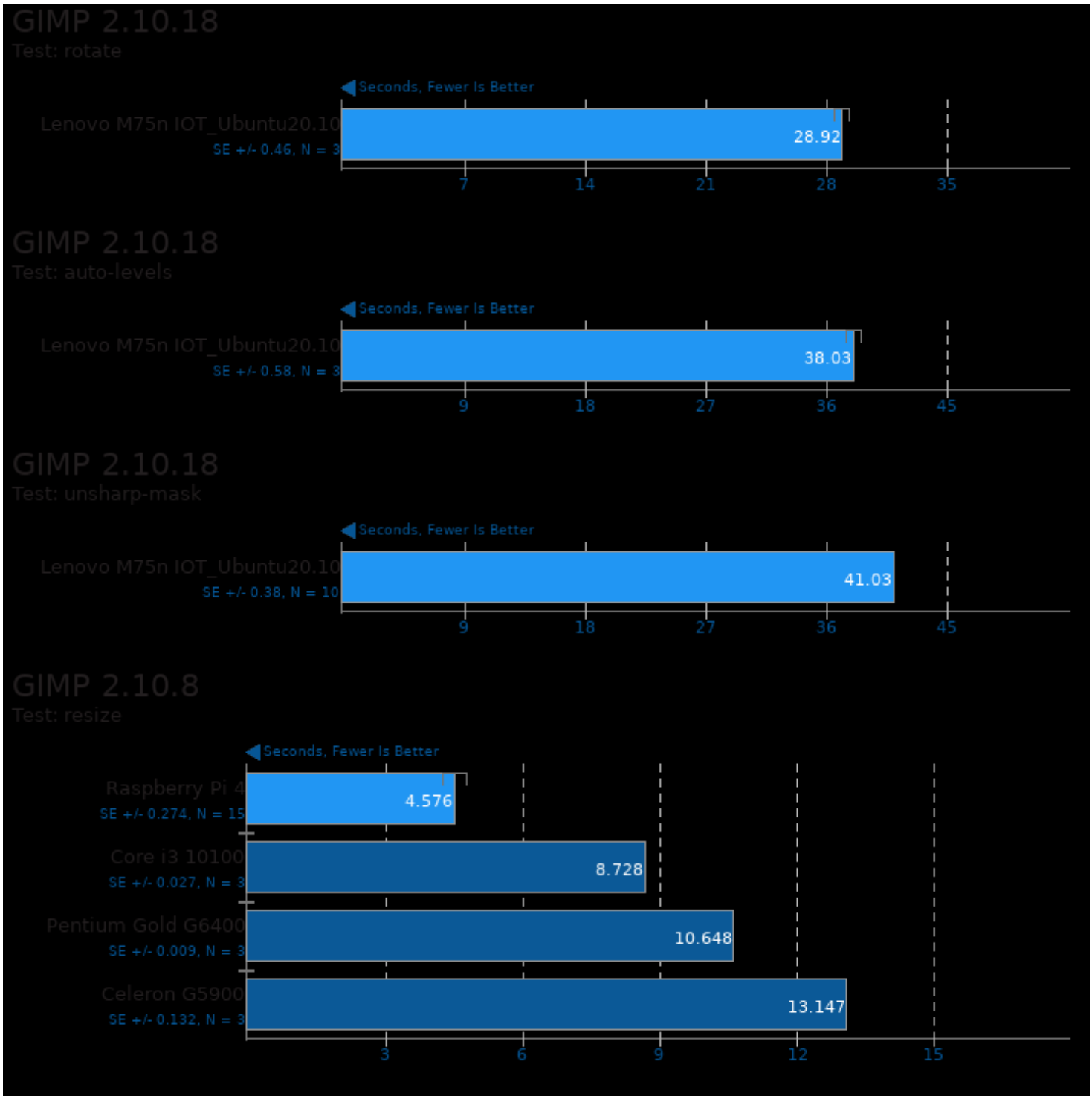

FLAC Audio Encoding 1.3.2
WAV To FLAC
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.529, N = 5
109.371
Core i3 10100
SE +/- 0.009, N = 5
8.420
Pentium Gold G6400
SE +/- 0.004, N = 5
9.456
Celeron G5900
SE +/- 0.004, N = 5
11.108
Lenovo M75n IoT_W10Pro
SE +/- 0.045, N = 5
15.079
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.060, N = 5
18.062
20
40
60
80
100
1. (CXX) g++ options: -O2 -fvisibility=hidden -logg -lm
GEGL
Operation: Crop
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.677, N = 4
50.874
Core i3 10100
SE +/- 0.046, N = 3
8.527
Pentium Gold G6400
SE +/- 0.082, N = 3
9.509
Celeron G5900
SE +/- 0.071, N = 3
10.893
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.151, N = 3
17.289
11
22
33
44
55

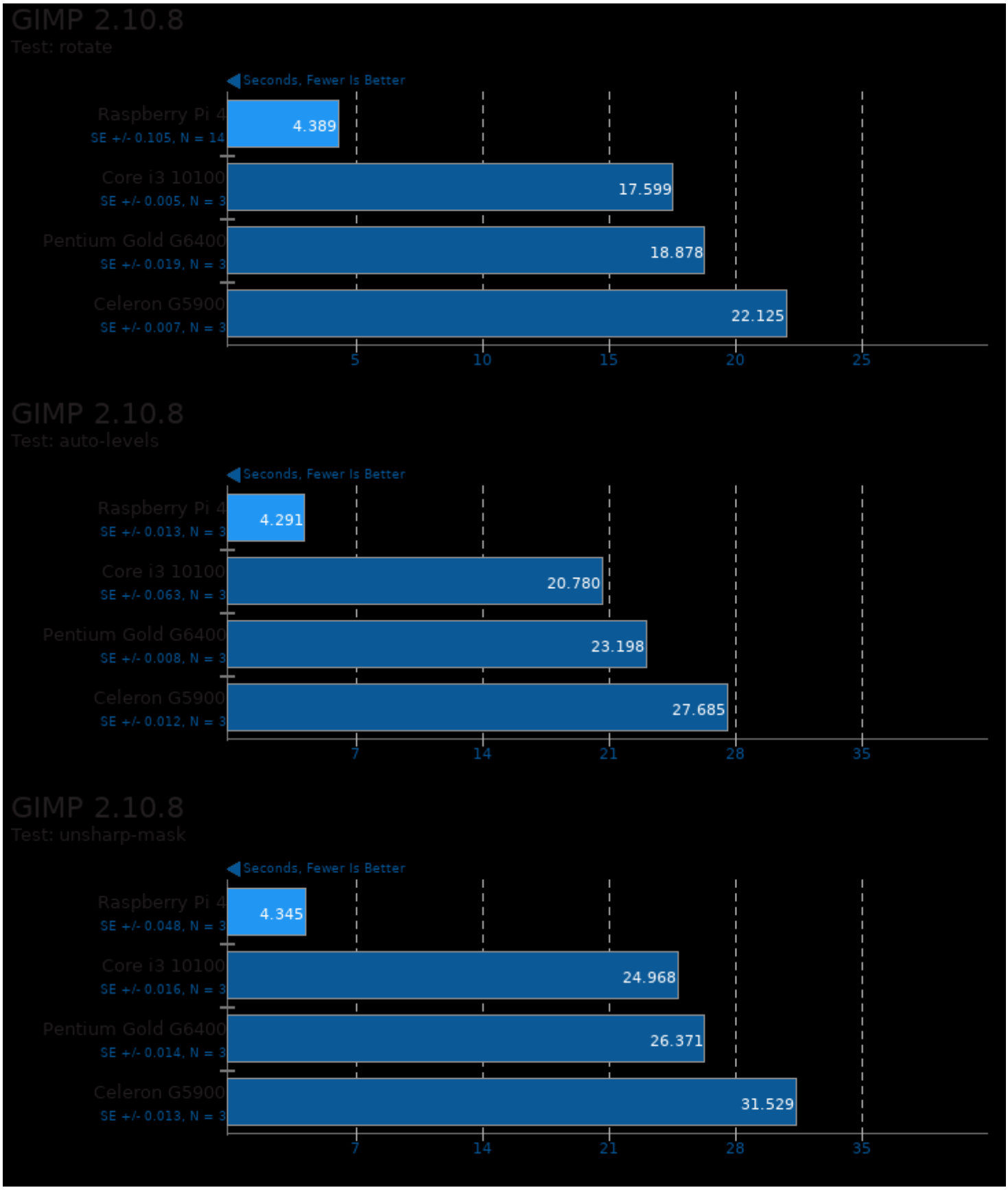

GEGL
Operation: Scale
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.098, N = 3
36.875
Core i3 10100
SE +/- 0.034, N = 3
5.478
Pentium Gold G6400
SE +/- 0.047, N = 3
6.236
Celeron G5900
SE +/- 0.003, N = 3
7.229
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.042, N = 3
16.275
8
16
24
32
40
GEGL
Operation: Cartoon
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 3.12, N = 3
647.55
Core i3 10100
SE +/- 0.16, N = 3
105.90
Pentium Gold G6400
SE +/- 0.23, N = 3
117.13
Celeron G5900
SE +/- 0.10, N = 3
137.54
Lenovo M75n IOT_Ubuntu20.10
SE +/- 1.60, N = 3
175.18
140
280
420
560
700

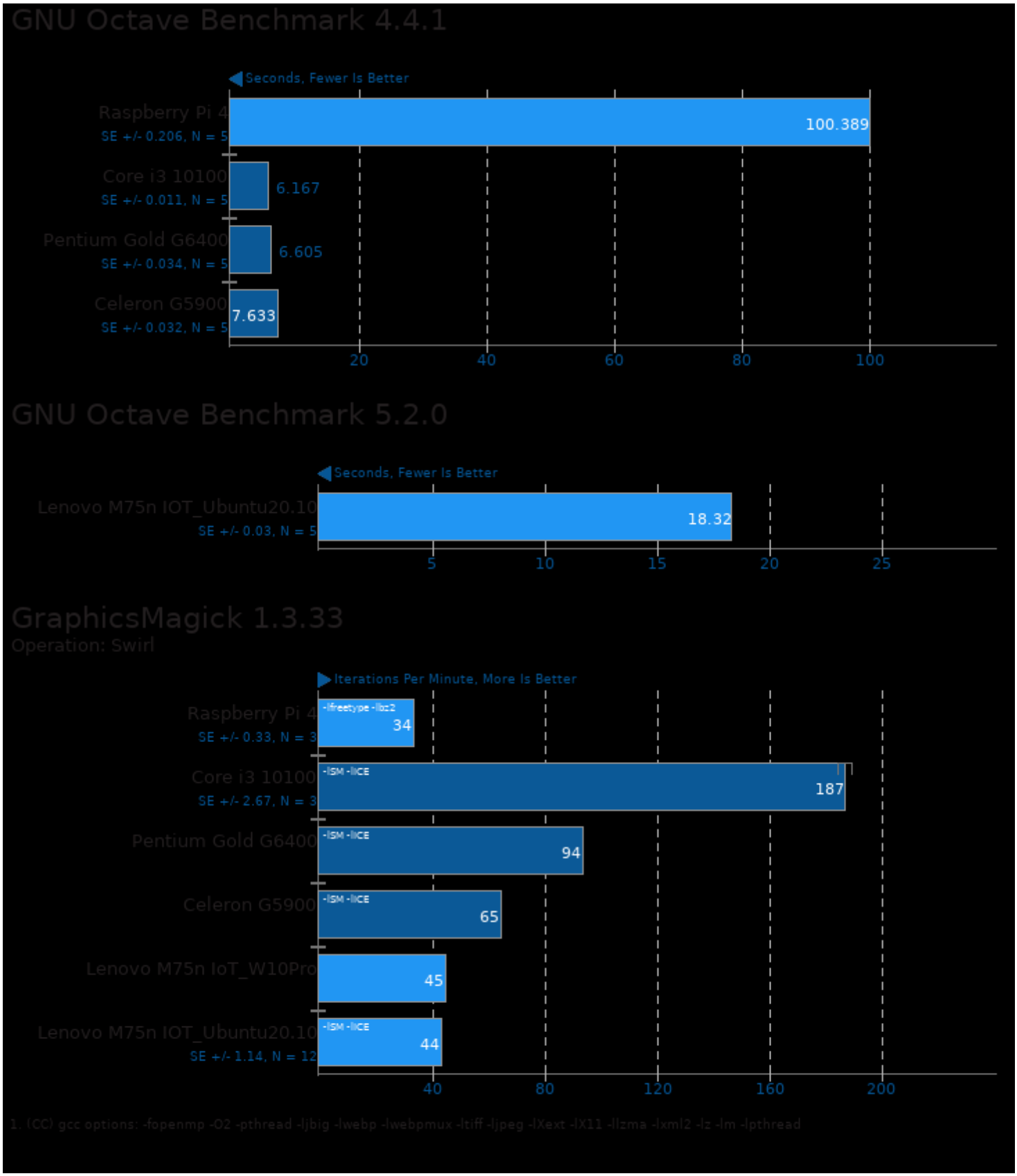

GEGL
Operation: Reflect
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.06, N = 3
14.99
Core i3 10100
SE +/- 0.07, N = 3
31.14
Pentium Gold G6400
SE +/- 0.04, N = 3
33.54
Celeron G5900
SE +/- 0.06, N = 3
39.43
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.41, N = 3
65.90
15
30
45
60
75
GEGL
Operation: Antialias
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.66, N = 3
214.86
Core i3 10100
SE +/- 0.03, N = 3
40.70
Pentium Gold G6400
SE +/- 0.12, N = 3
47.34
Celeron G5900
SE +/- 0.02, N = 3
56.74
Lenovo M75n IOT_Ubuntu20.10
SE +/- 1.04, N = 15
86.47
50
100
150
200
250

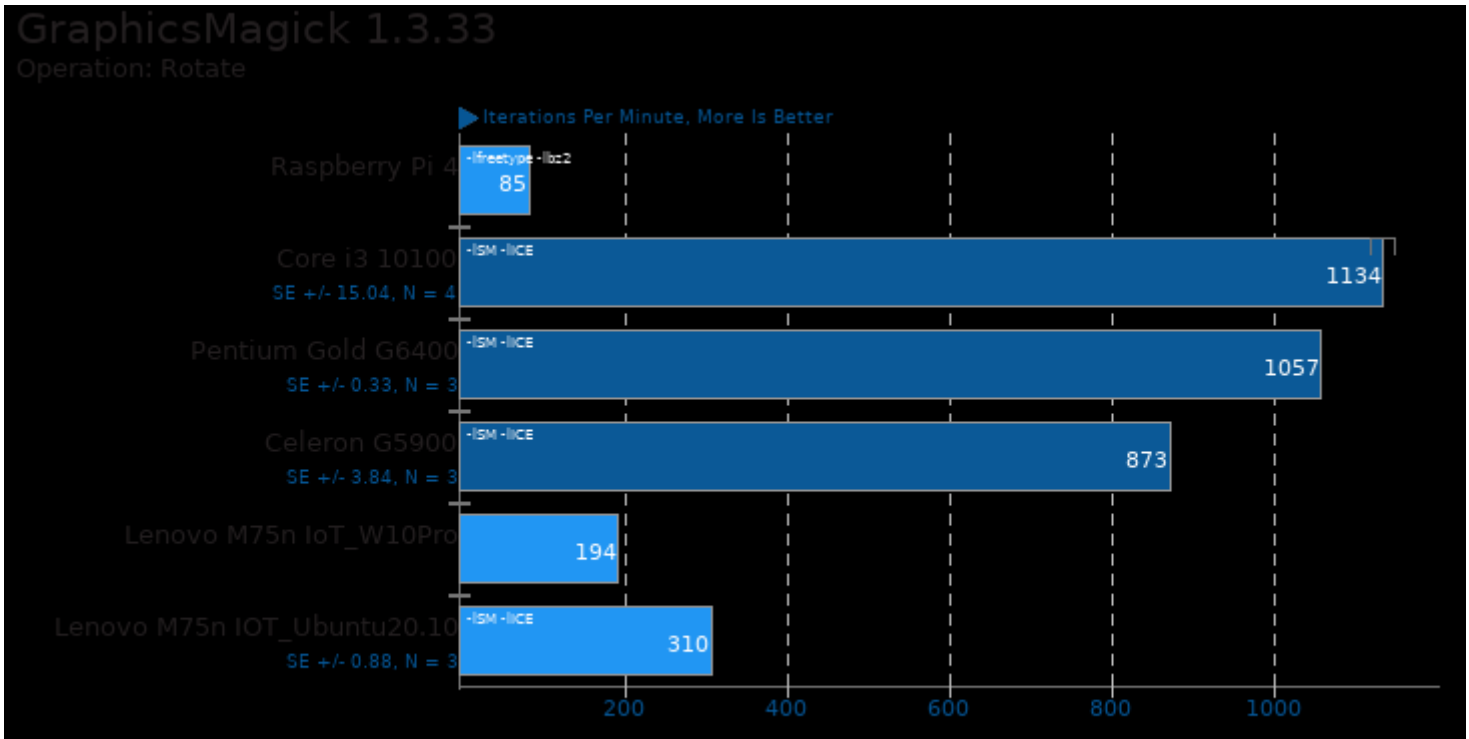

GEGL
Operation: Tile Glass
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 1.11, N = 3
161.31
Core i3 10100
SE +/- 0.04, N = 3
30.74
Pentium Gold G6400
SE +/- 0.11, N = 3
33.04
Celeron G5900
SE +/- 0.02, N = 3
38.37
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.12, N = 3
60.61
40
80
120
160
200
GEGL
Operation: Wavelet Blur
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 1.27, N = 3
326.61
Core i3 10100
SE +/- 0.09, N = 3
62.37
Pentium Gold G6400
SE +/- 0.13, N = 3
68.48
Celeron G5900
SE +/- 0.01, N = 3
79.50
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.11, N = 3
108.10
70
140
210
280
350

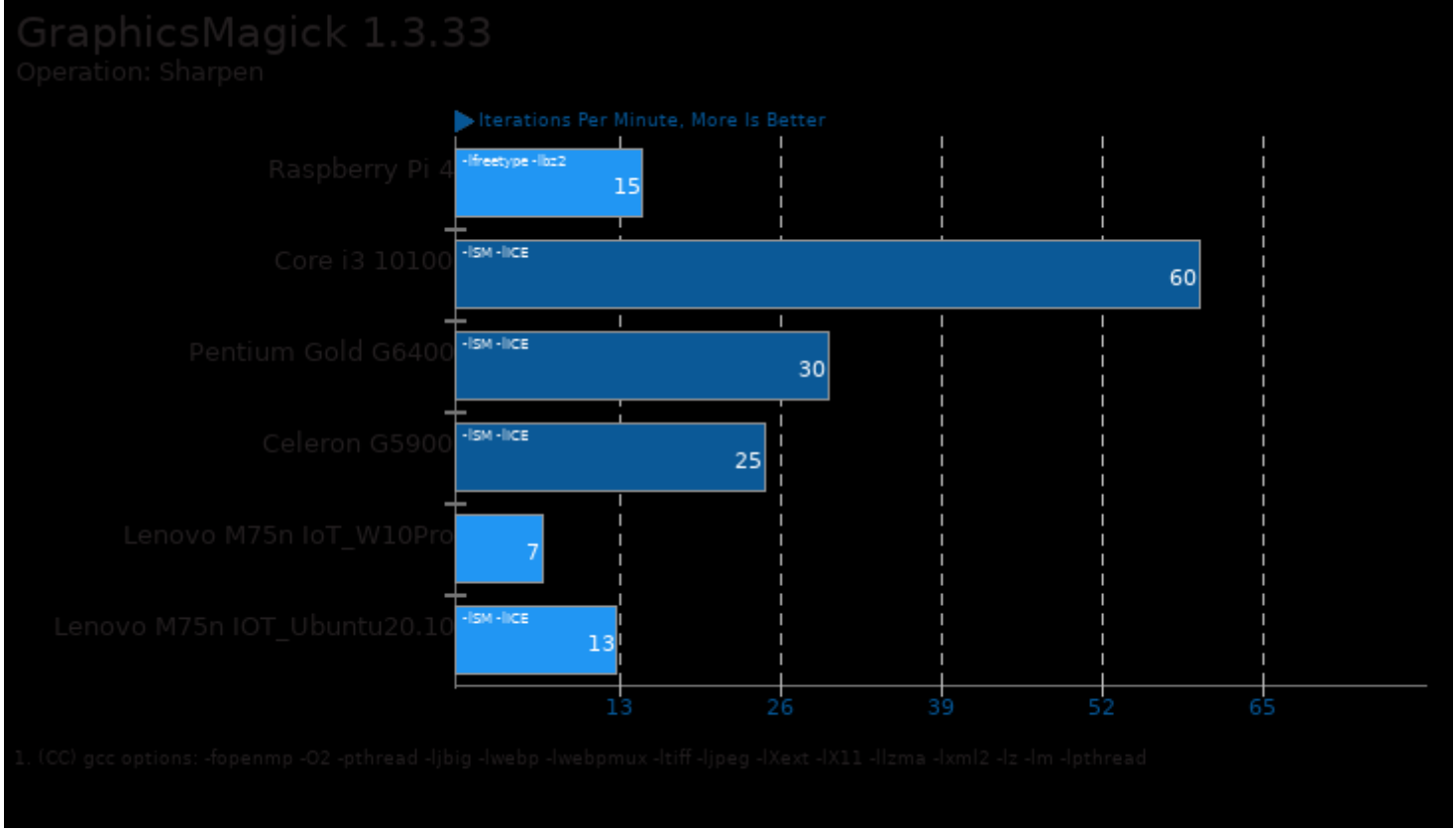

GEGL
Operation: Color Enhance
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 1.03, N = 3
341.55
Core i3 10100
SE +/- 0.02, N = 3
59.44
Pentium Gold G6400
SE +/- 0.05, N = 3
64.28
Celeron G5900
SE +/- 0.06, N = 3
75.07
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.20, N = 3
104.58
70
140
210
280
350
GEGL
Operation: Rotate 90 Degrees
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.40, N = 3
246.62
Core i3 10100
SE +/- 0.05, N = 3
41.73
Pentium Gold G6400
SE +/- 0.11, N = 3
47.59
Celeron G5900
SE +/- 0.03, N = 3
56.29
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.83, N = 3
93.07
50
100
150
200
250
GIMP 2.10.18
Test: resize
Seconds, Fewer Is Better
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.61, N = 3
35.89
8
16
24
32
40

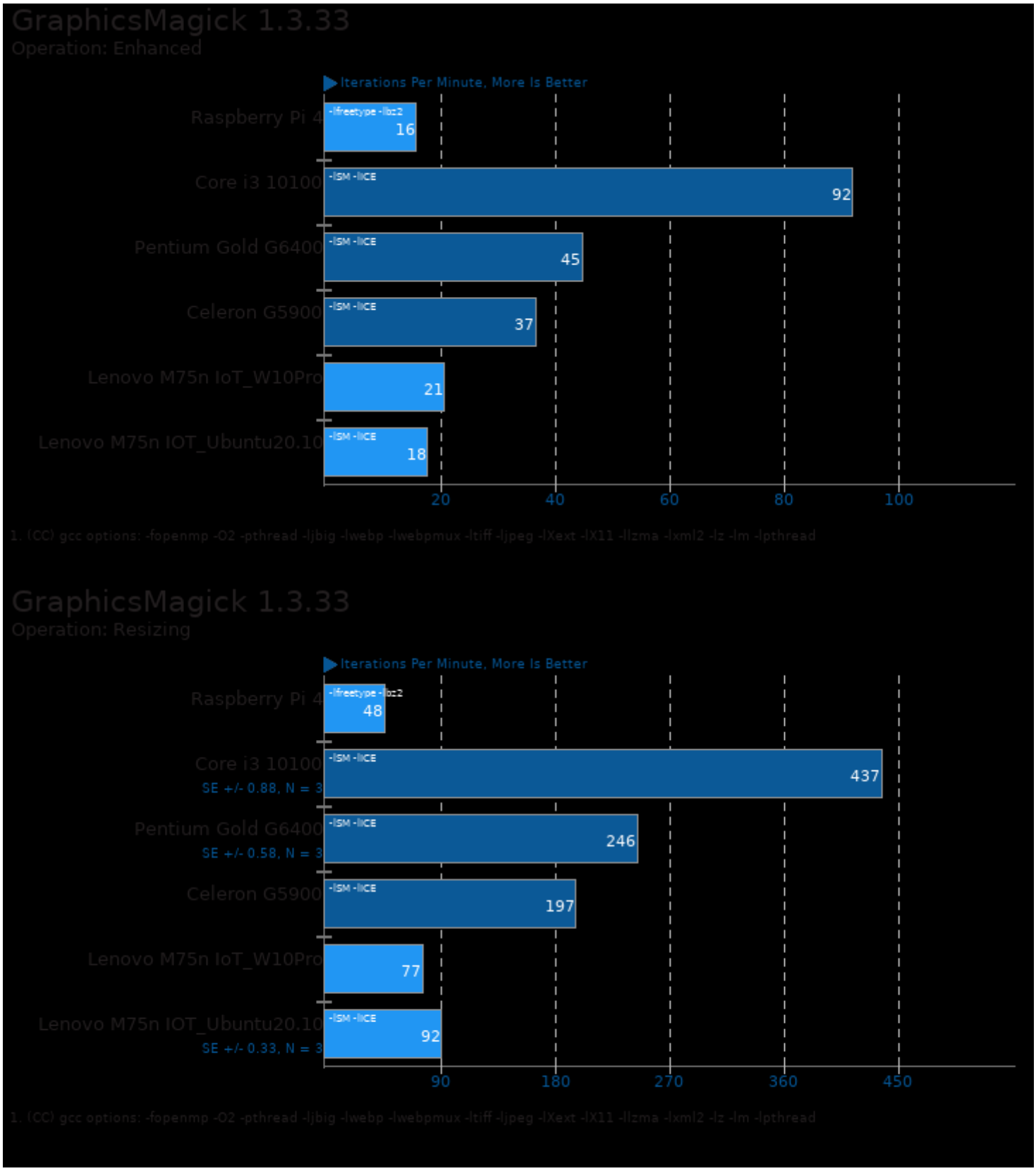

GIMP 2.10.18
Test: rotate
Seconds, Fewer Is Better
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.46, N = 3
28.92
7
14
21
28
35
GIMP 2.10.18
Test: auto-levels
Seconds, Fewer Is Better
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.58, N = 3
38.03
9
18
27
36
45
GIMP 2.10.18
Test: unsharp-mask
Seconds, Fewer Is Better
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.38, N = 10
41.03
9
18
27
36
45
GIMP 2.10.8
Test: resize
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.274, N = 15
4.576
Core i3 10100
SE +/- 0.027, N = 3
8.728
Pentium Gold G6400
SE +/- 0.009, N = 3
10.648
Celeron G5900
SE +/- 0.132, N = 3
13.147
3
6
9
12
15

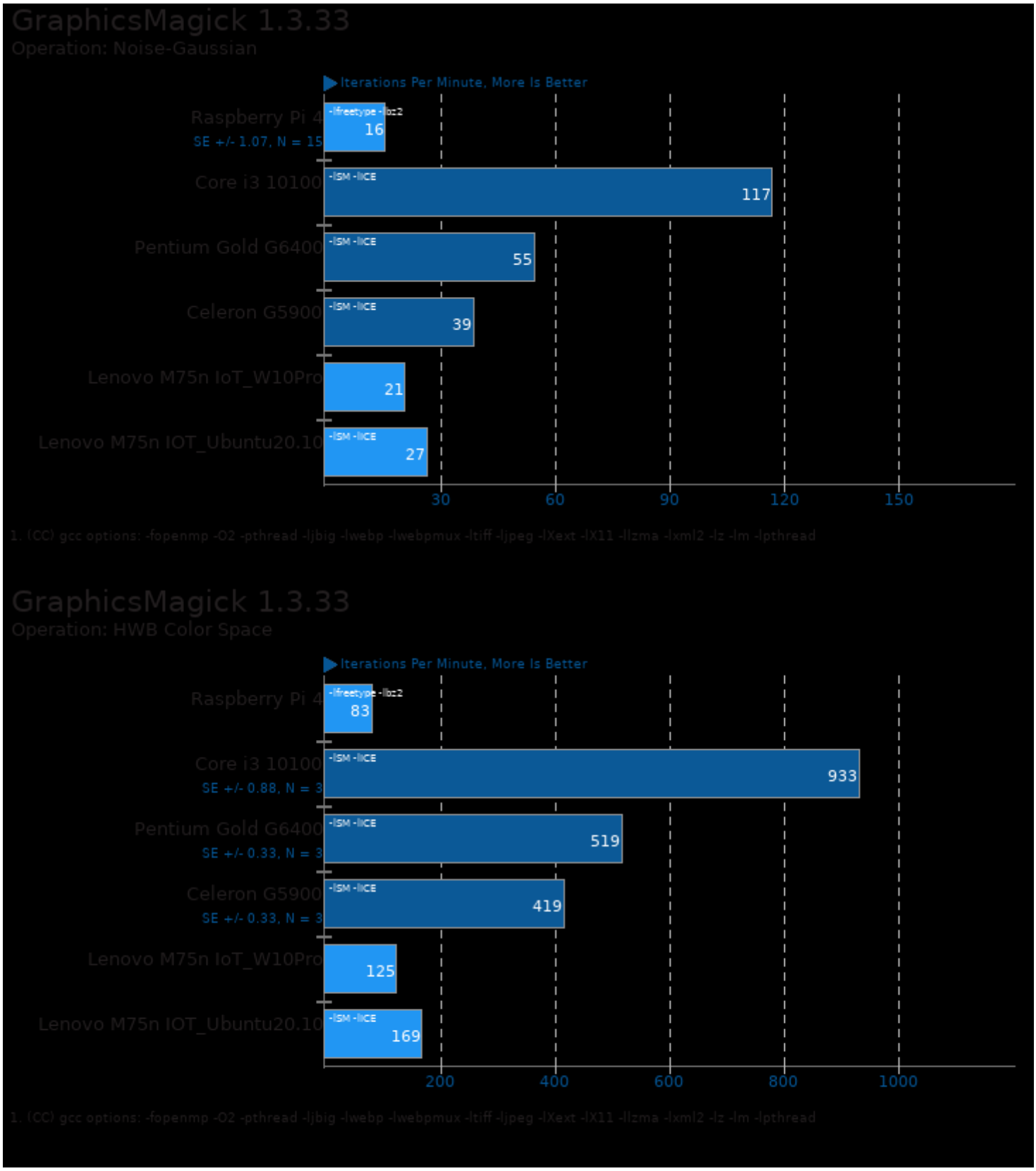

GIMP 2.10.8
Test: rotate
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.105, N = 14
4.389
Core i3 10100
SE +/- 0.005, N = 3
17.599
Pentium Gold G6400
SE +/- 0.019, N = 3
18.878
Celeron G5900
SE +/- 0.007, N = 3
22.125
5
10
15
20
25
GIMP 2.10.8
Test: auto-levels
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.013, N = 3
4.291
Core i3 10100
SE +/- 0.063, N = 3
20.780
Pentium Gold G6400
SE +/- 0.008, N = 3
23.198
Celeron G5900
SE +/- 0.012, N = 3
27.685
7
14
21
28
35
GIMP 2.10.8
Test: unsharp-mask
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.048, N = 3
4.345
Core i3 10100
SE +/- 0.016, N = 3
24.968
Pentium Gold G6400
SE +/- 0.014, N = 3
26.371
Celeron G5900
SE +/- 0.013, N = 3
31.529
7
14
21
28
35

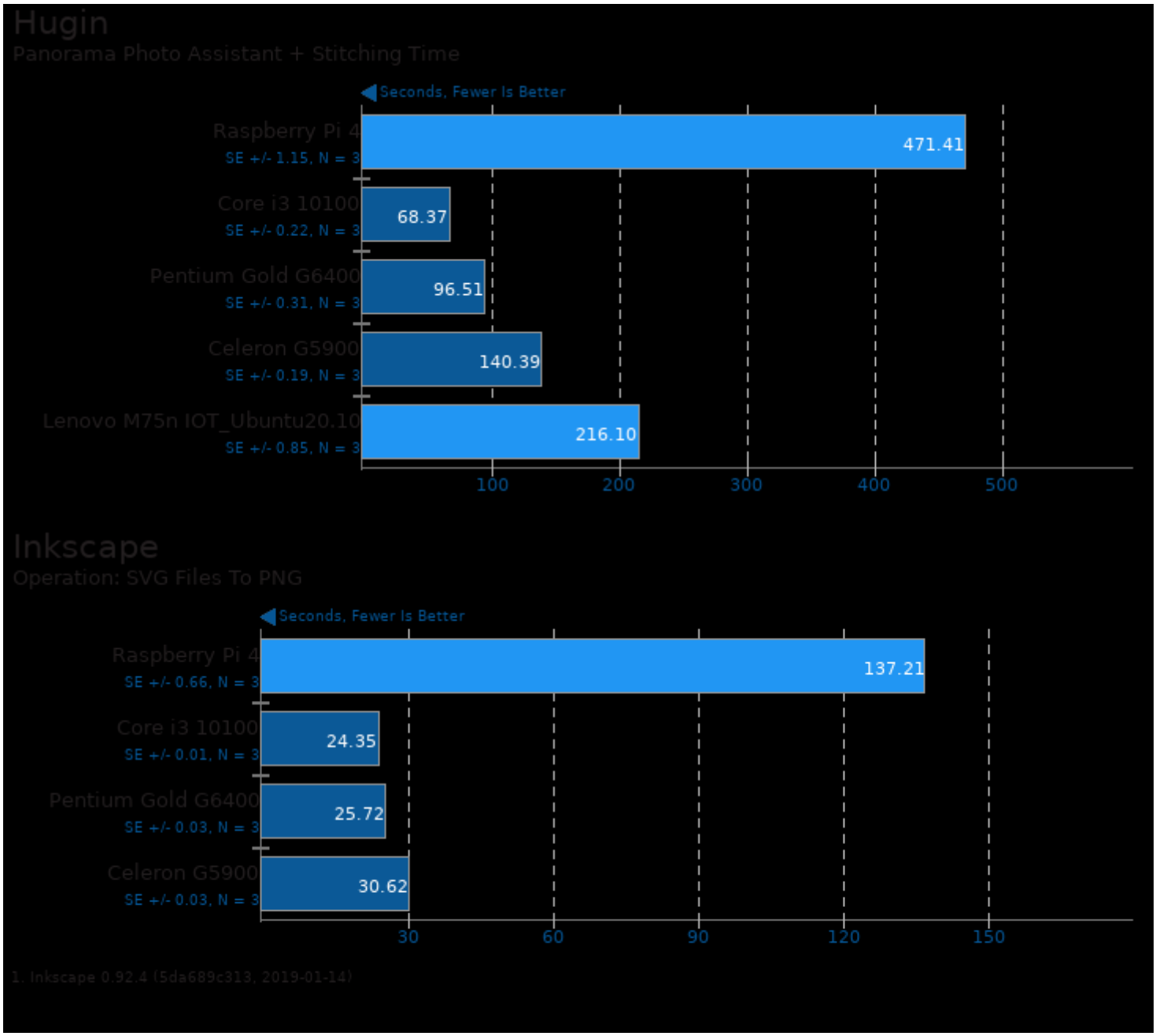

GNU Octave Benchmark 4.4.1
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.206, N = 5
100.389
Core i3 10100
SE +/- 0.011, N = 5
6.167
Pentium Gold G6400
SE +/- 0.034, N = 5
6.605
Celeron G5900
SE +/- 0.032, N = 5
7.633
20
40
60
80
100
GNU Octave Benchmark 5.2.0
Seconds, Fewer Is Better
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.03, N = 5
18.32
5
10
15
20
25
GraphicsMagick 1.3.33
Operation: Swirl
Iterations Per Minute, More Is Better
Raspberry Pi 4
SE +/- 0.33, N = 3
-lfreetype -lbz2
34
Core i3 10100
SE +/- 2.67, N = 3
-ISM -lICE
187
Pentium Gold G6400
-ISM -lICE
94
Celeron G5900
-ISM -lICE
65
Lenovo M75n IoT_W10Pro
45
Lenovo M75n IOT_Ubuntu20.10
SE +/- 1.14, N = 12
-ISM -lICE
44
40
80
120
160
200
1: (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma -lxml2 -lz -lm -lpthread

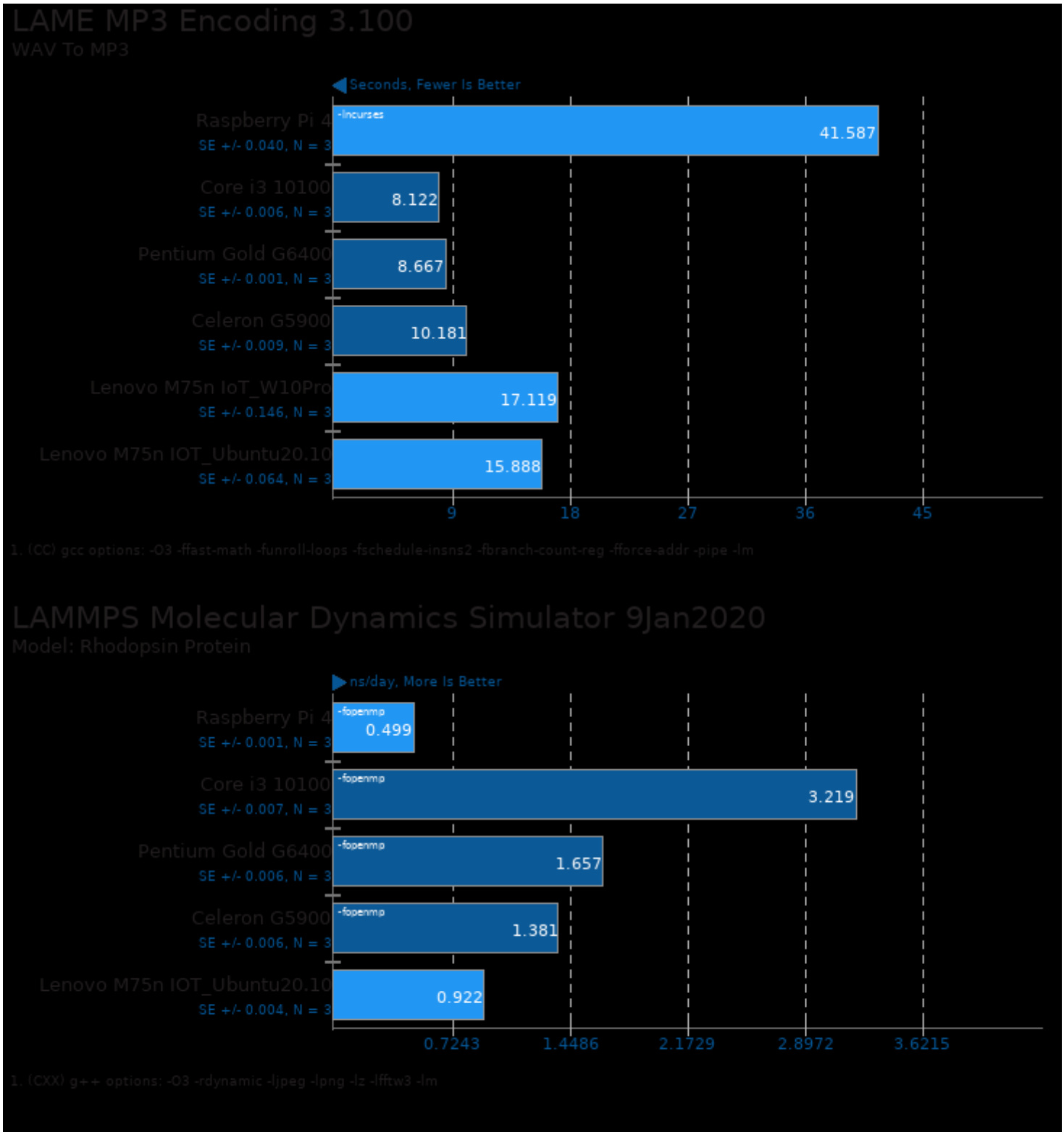

GraphicsMagick 1.3.33
Operation: Rotate
Iterations Per Minute, More Is Better
Raspberry Pi 4
-lfreetype -lbz2
85
Core i3 10100
SE +/- 15.04, N = 4
-lSM -lICE
1134
Pentium Gold G6400
SE +/- 0.33, N = 3
-lSM -lICE
1057
Celeron G5900
SE +/- 3.84, N = 3
-lSM -lICE
873
Lenovo M75n IoT_W10Pro
194
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.88, N = 3
-lSM -lICE
310
200
400
600
800
1000
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma -lxml2 -lz -lm -lpthread

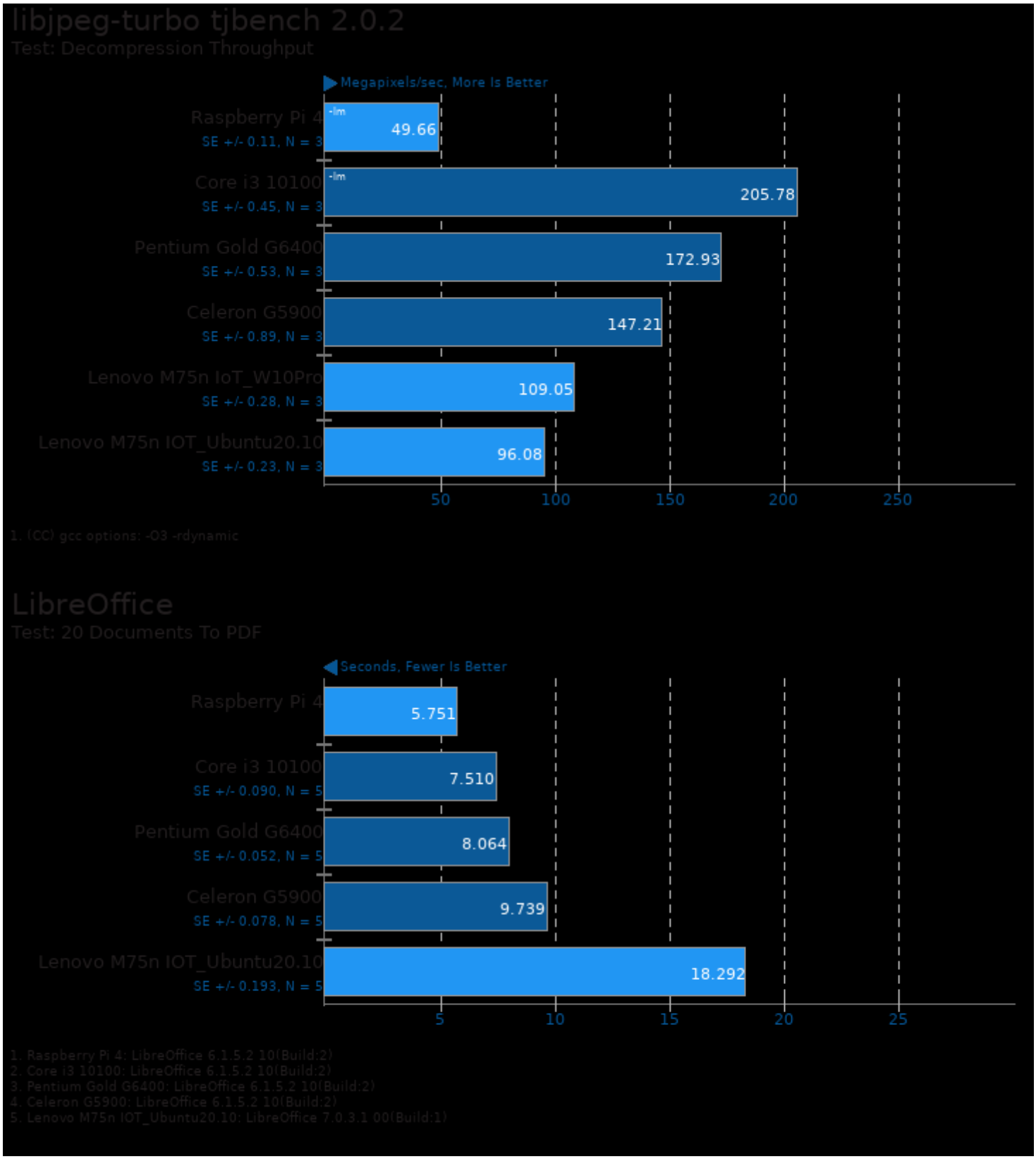

GraphicsMagick 1.3.33
Operation: Sharpen
Iterations Per Minute, More Is Better
Raspberry Pi 4
-lfreetype -lbz2
15
Core i3 10100
-lSM -lICE
60
Pentium Gold G6400
-lSM -lICE
30
Celeron G5900
-lSM -lICE
25
Lenovo M75n IoT_W10Pro
7
Lenovo M75n IOT_Ubuntu20.10
-lSM -lICE
13
13
26
39
52
65
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma -lxml2 -lz -lm -lpthread


GraphicsMagick 1.3.33
Operation: Enhanced
Iterations Per Minute, More Is Better
Raspberry Pi 4
Core i3 10100
Pentium Gold G6400
Celeron G5900
Lenovo M75n IoT_W10Pro
Lenovo M75n IOT_Ubuntu20.10
-lfreetype -lbz2
16
-lSM -lICE
92
45
37
21
18
20
40
60
80
100
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: Resizing
Iterations Per Minute, More Is Better
Raspberry Pi 4
48
Core i3 10100
SE +/- 0.88, N = 3
437
Pentium Gold G6400
SE +/- 0.58, N = 3
246
Celeron G5900
197
Lenovo M75n IoT_W10Pro
77
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.33, N = 3
92
90
180
270
360
450
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma -lxml2 -lz -lm -lpthread


GraphicsMagick 1.3.33
Operation: Noise-Gaussian
Iterations Per Minute, More Is Better
Raspberry Pi 4
SE +/- 1.07, N = 15
Core i3 10100
Pentium Gold G6400
Celeron G5900
Lenovo M75n IoT_W10Pro
Lenovo M75n IOT_Ubuntu20.10
-lfreetype -lbz2
-ISM -lICE
16
117
55
39
21
27
30
60
90
120
150
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma -lxml2 -lz -lm -lpthread
GraphicsMagick 1.3.33
Operation: HWB Color Space
Iterations Per Minute, More Is Better
Raspberry Pi 4
Core i3 10100
SE +/- 0.88, N = 3
Pentium Gold G6400
SE +/- 0.33, N = 3
Celeron G5900
SE +/- 0.33, N = 3
Lenovo M75n IoT_W10Pro
Lenovo M75n IOT_Ubuntu20.10
-lfreetype -lbz2
-ISM -lICE
83
933
519
419
125
169
200
400
600
800
1000
1. (CC) gcc options: -fopenmp -O2 -pthread -ljbig -lwebp -lwebpmux -ltiff -ljpeg -lXext -lX11 -llzma -lxml2 -lz -lm -lpthread

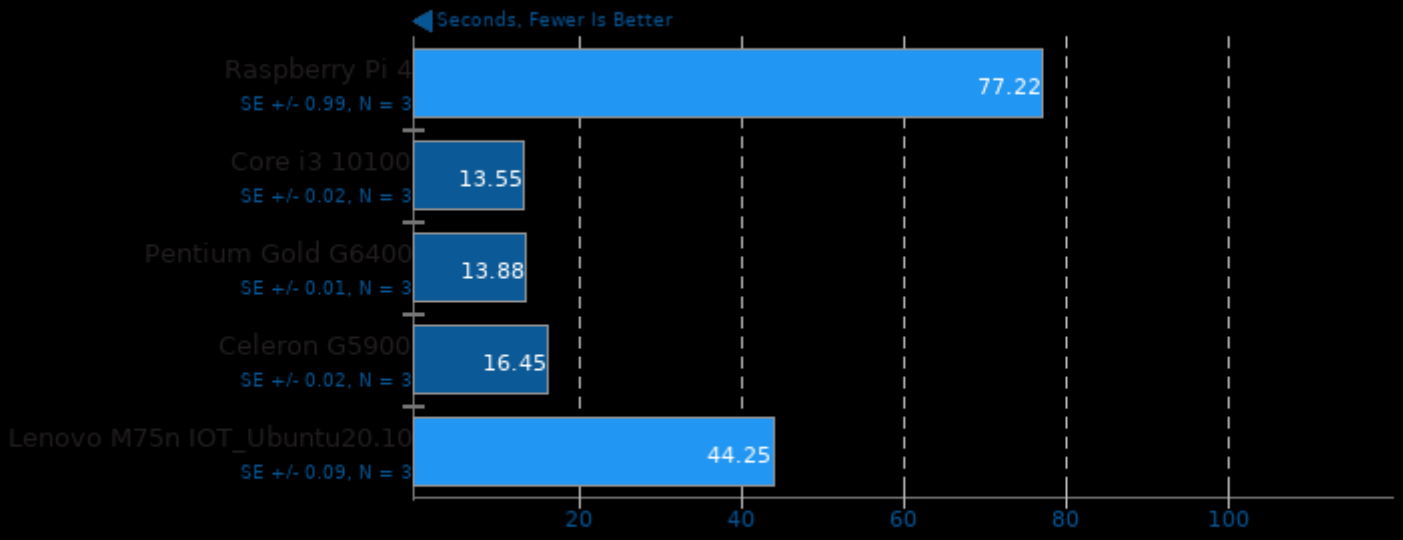

Hugin
Panorama Photo Assistant + Stitching Time
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 1.15, N = 3
471.41
Core i3 10100
SE +/- 0.22, N = 3
68.37
Pentium Gold G6400
SE +/- 0.31, N = 3
96.51
Celeron G5900
SE +/- 0.19, N = 3
140.39
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.85, N = 3
216.10
100
200
300
400
500
Inkscape
Operation: SVG Files To PNG
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.66, N = 3
137.21
Core i3 10100
SE +/- 0.01, N = 3
24.35
Pentium Gold G6400
SE +/- 0.03, N = 3
25.72
Celeron G5900
SE +/- 0.03, N = 3
30.62
30
60
90
120
150
1. Inkscape 0.92.4 (5da689c313, 2019-01-14)


LAME MP3 Encoding 3.100
WAV To MP3
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.040, N = 3
-lncurses
41.587
Core i3 10100
SE +/- 0.006, N = 3
8.122
Pentium Gold G6400
SE +/- 0.001, N = 3
8.667
Celeron G5900
SE +/- 0.009, N = 3
10.181
Lenovo M75n IoT_W10Pro
SE +/- 0.146, N = 3
17.119
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.064, N = 3
15.888
9
18
27
36
45
1. (CC) gcc options: -O3 -ffast-math -funroll-loops -fschedule-insns2 -fbranch-count-reg -fforce-addr -pipe -lm
LAMMPS Molecular Dynamics Simulator 9Jan2020
Model: Rhodopsin Protein
ns/day, More Is Better
Raspberry Pi 4
SE +/- 0.001, N = 3
-fopenmp
0.499
Core i3 10100
SE +/- 0.007, N = 3
-fopenmp
3.219
Pentium Gold G6400
SE +/- 0.006, N = 3
-fopenmp
1.657
Celeron G5900
SE +/- 0.006, N = 3
-fopenmp
1.381
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.004, N = 3
0.922
0.7243
1.4486
2.1729
2.8972
3.6215
1. (CXX) g++ options: -O3 -rdynamic -ljpeg -lpng -lz -lfftw3 -lm


libjpeg-turbo tjbench 2.0.2
Test: Decompression Throughput
Megapixels/sec, More Is Better
Raspberry Pi 4
SE +/- 0.11, N = 3
-lm
49.66
Core i3 10100
SE +/- 0.45, N = 3
-lm
205.78
Pentium Gold G6400
SE +/- 0.53, N = 3
172.93
Celeron G5900
SE +/- 0.89, N = 3
147.21
Lenovo M75n IoT_W10Pro
SE +/- 0.28, N = 3
109.05
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.23, N = 3
96.08
50
100
150
200
250
1. (CC) gcc options: -O3 -rdynamic
LibreOffice
Test: 20 Documents To PDF
Seconds, Fewer Is Better
Raspberry Pi 4
5.751
Core i3 10100
SE +/- 0.090, N = 5
7.510
Pentium Gold G6400
SE +/- 0.052, N = 5
8.064
Celeron G5900
SE +/- 0.078, N = 5
9.739
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.193, N = 5
18.292
5
10
15
20
25
1. Raspberry Pi 4: LibreOffice 6.1.5.2 10(Build:2)
2. Core i3 10100: LibreOffice 6.1.5.2 10(Build:2)
3. Pentium Gold G6400: LibreOffice 6.1.5.2 10(Build:2)
4. Celeron G5900: LibreOffice 6.1.5.2 10(Build:2)
5. Lenovo M75n IOT_Ubuntu20.10: LibreOffice 7.0.3.1 00(Build:1)

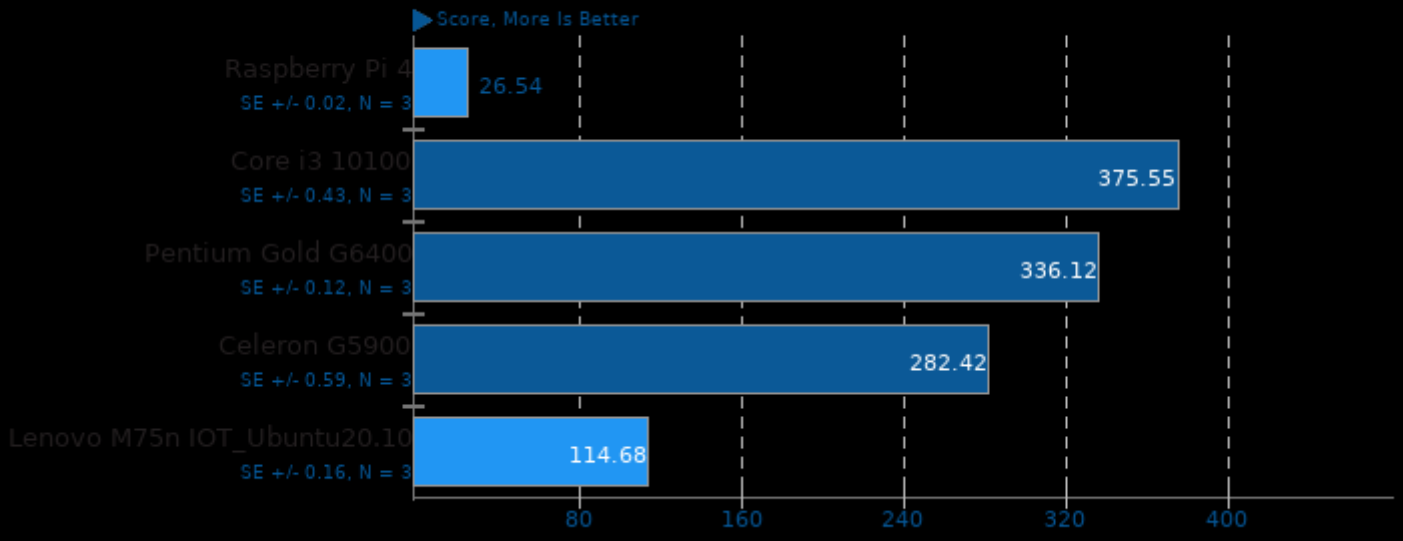
librsvg

Operation: SVG Files To PNG



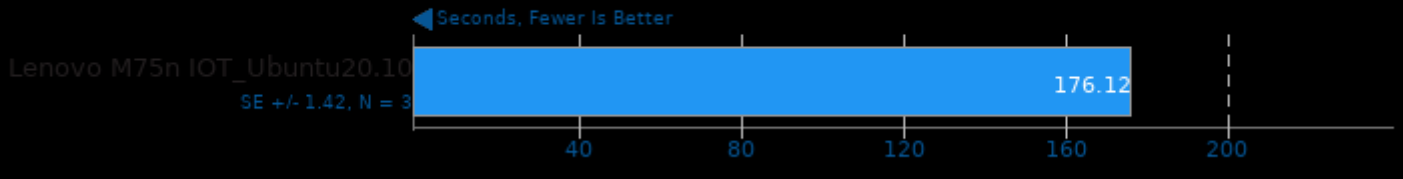
1. Raspberry Pi 4: rsvg-convert version 2.44.10
2. Core i3 10100: rsvg-convert version 2.44.10
3. Pentium Gold G6400: rsvg-convert version 2.44.10
4. Celeron G5900: rsvg-convert version 2.44.10
5. Lenovo M75n IOT_Ubuntu20.10: rsvg-convert version 2.50.1

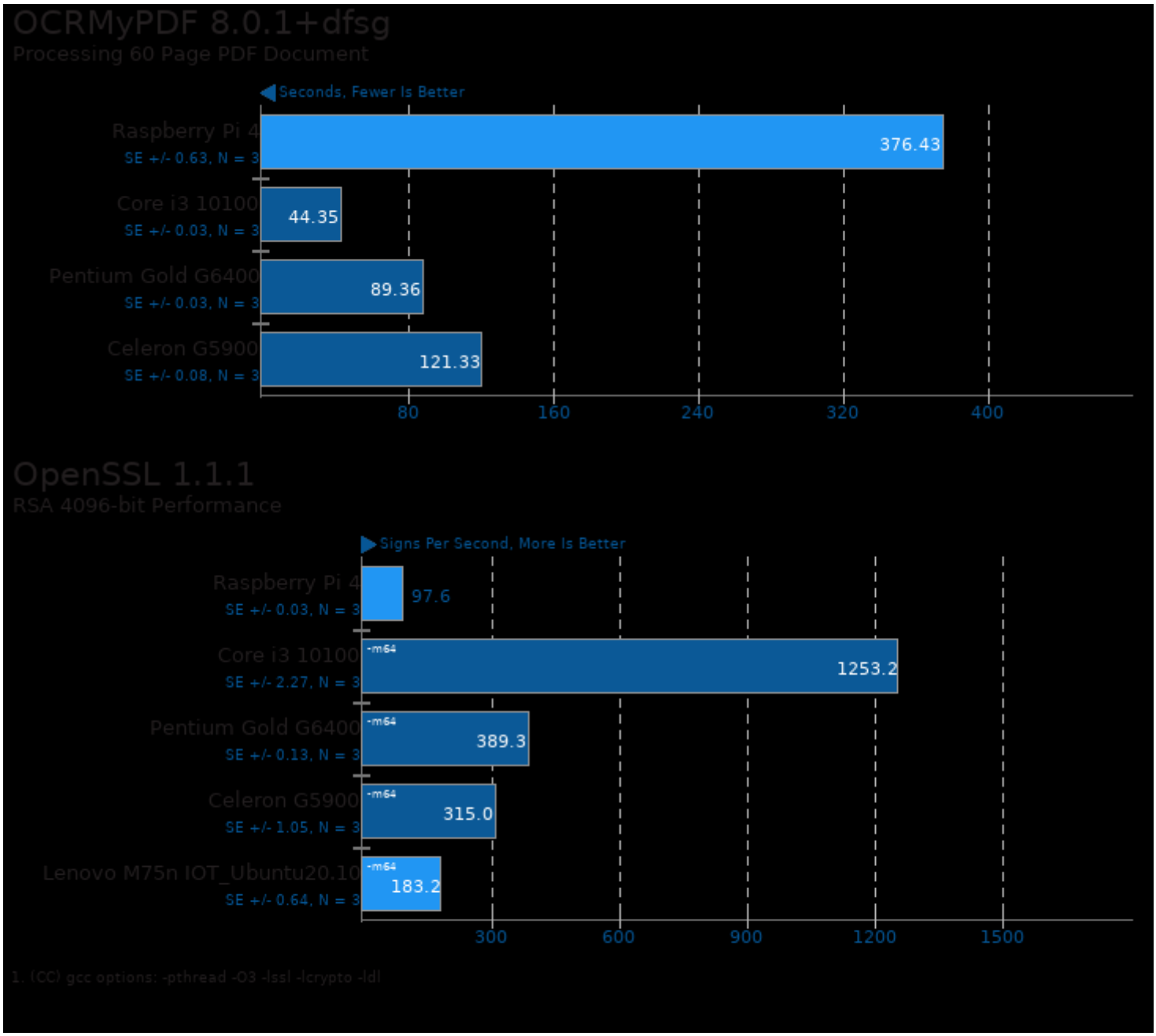
Numpy Benchmark

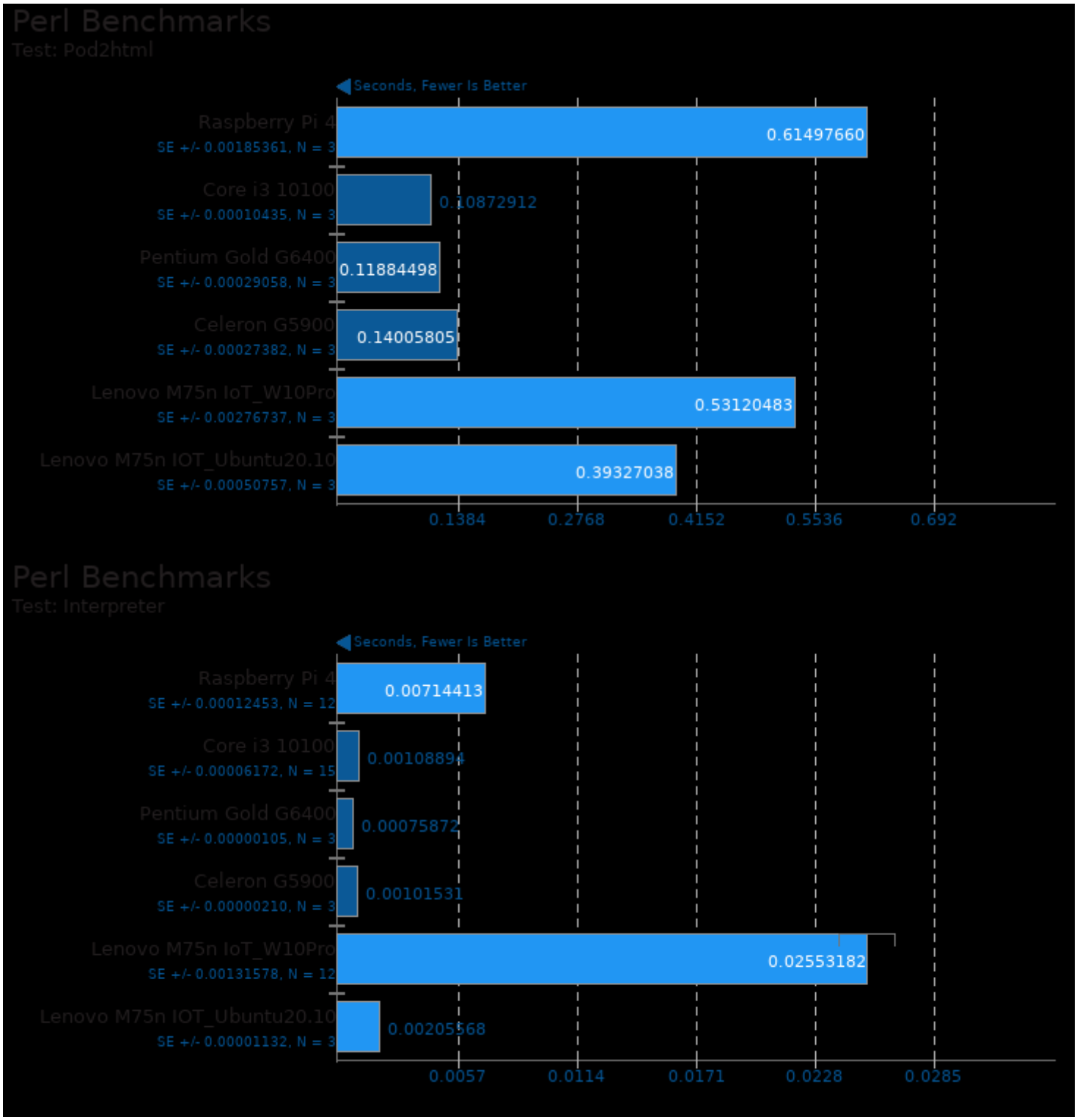


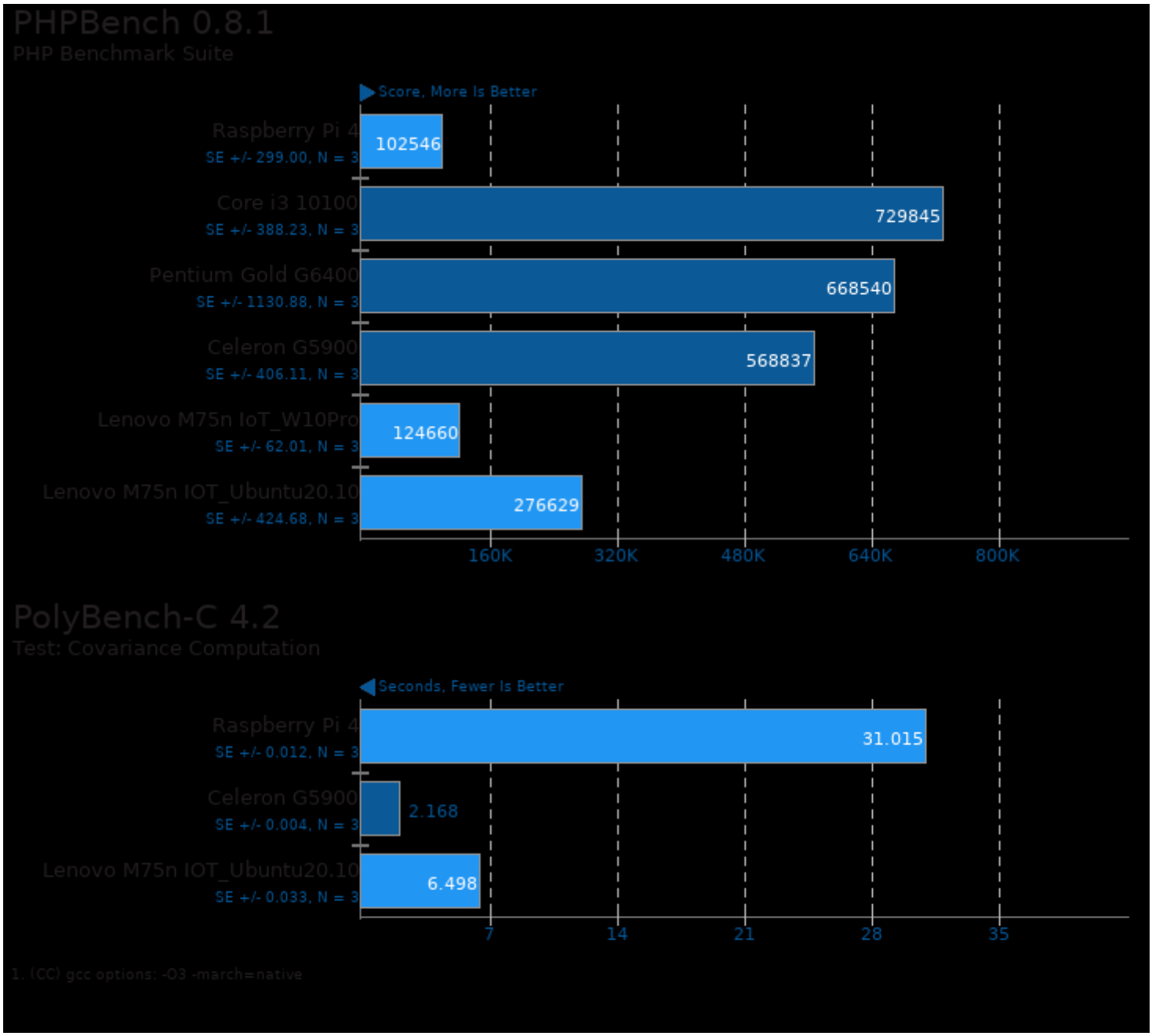
OCRMyPDF 10.3.1+dfsg

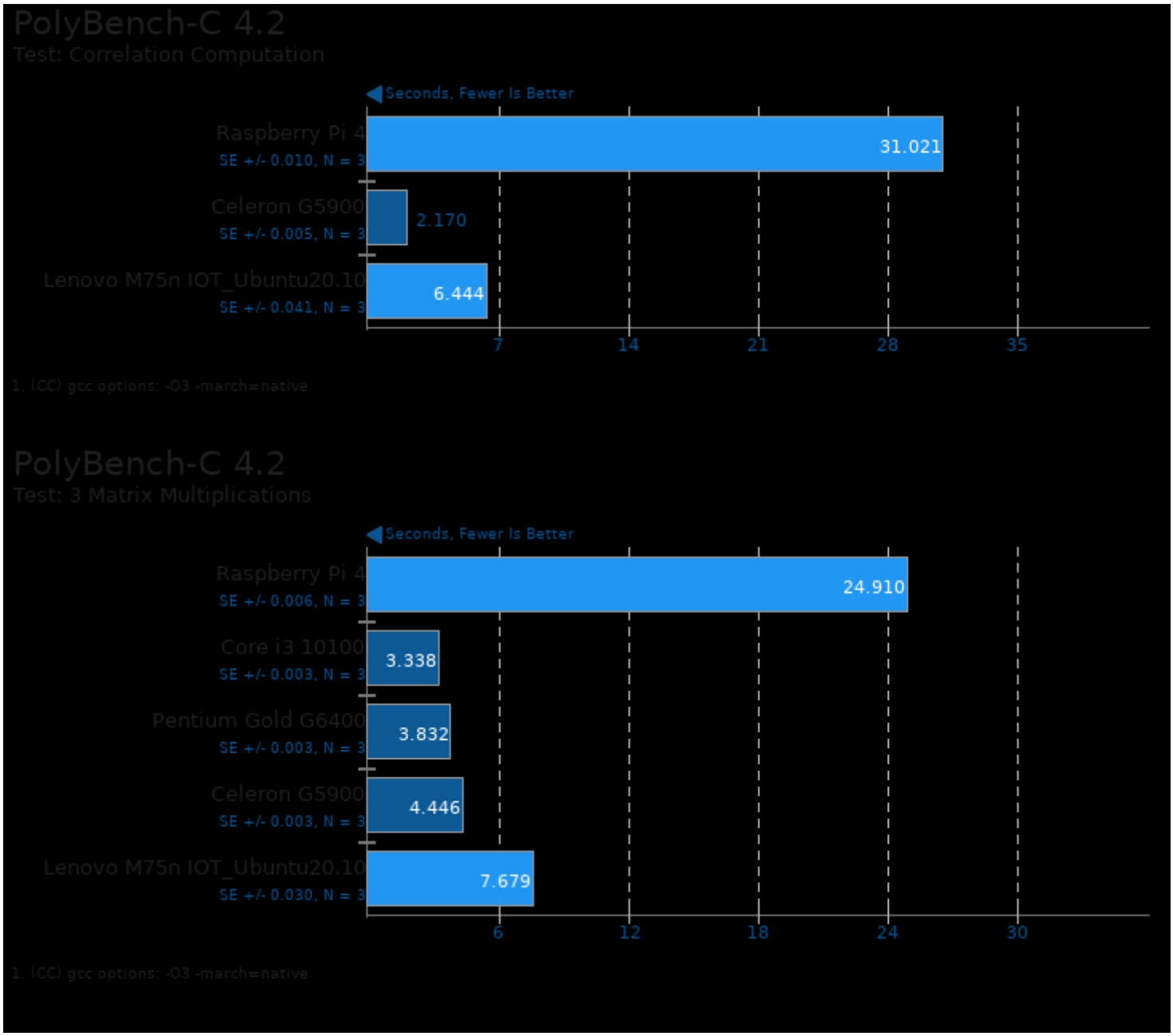
Processing 60 Page PDF Document

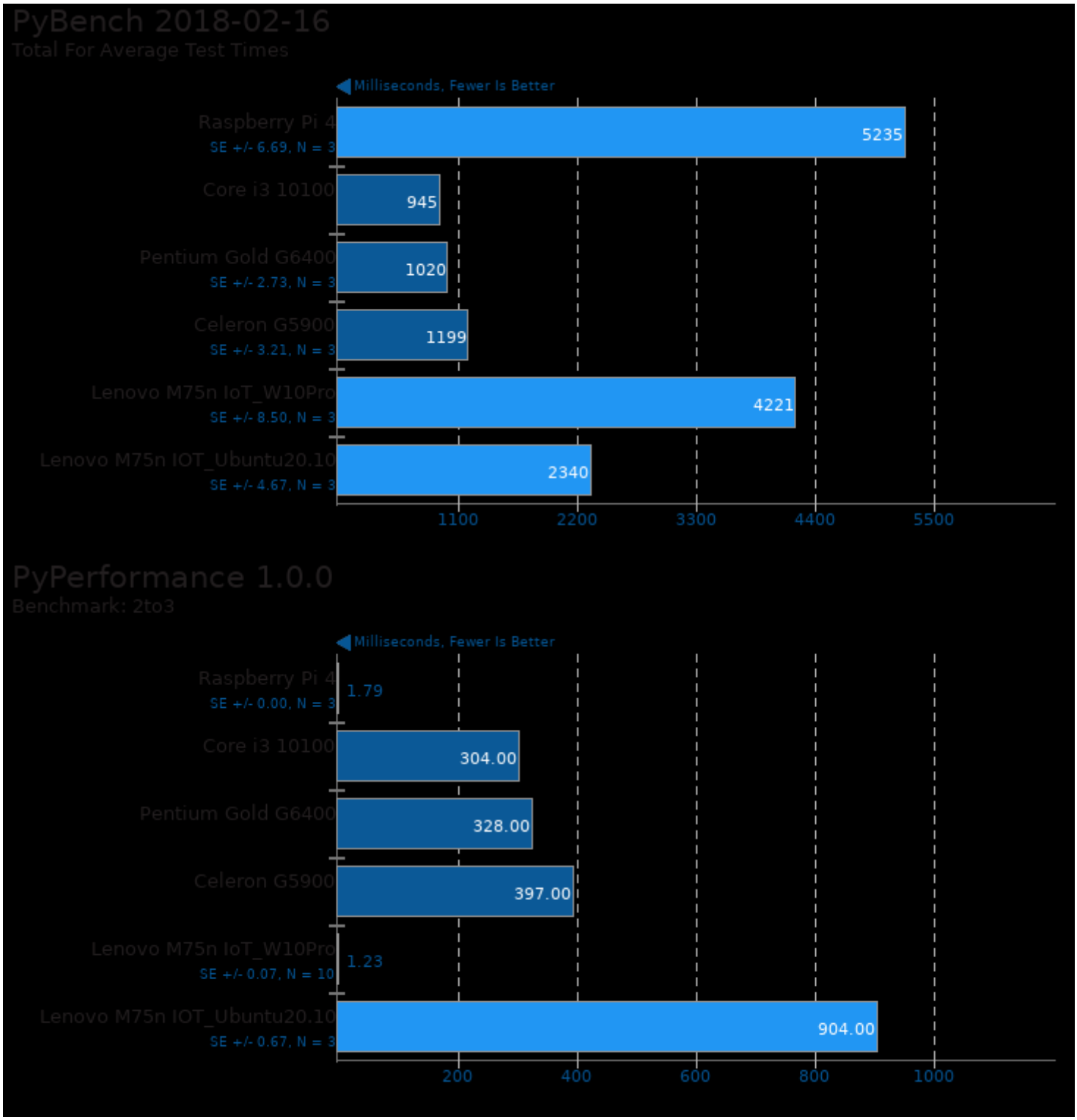


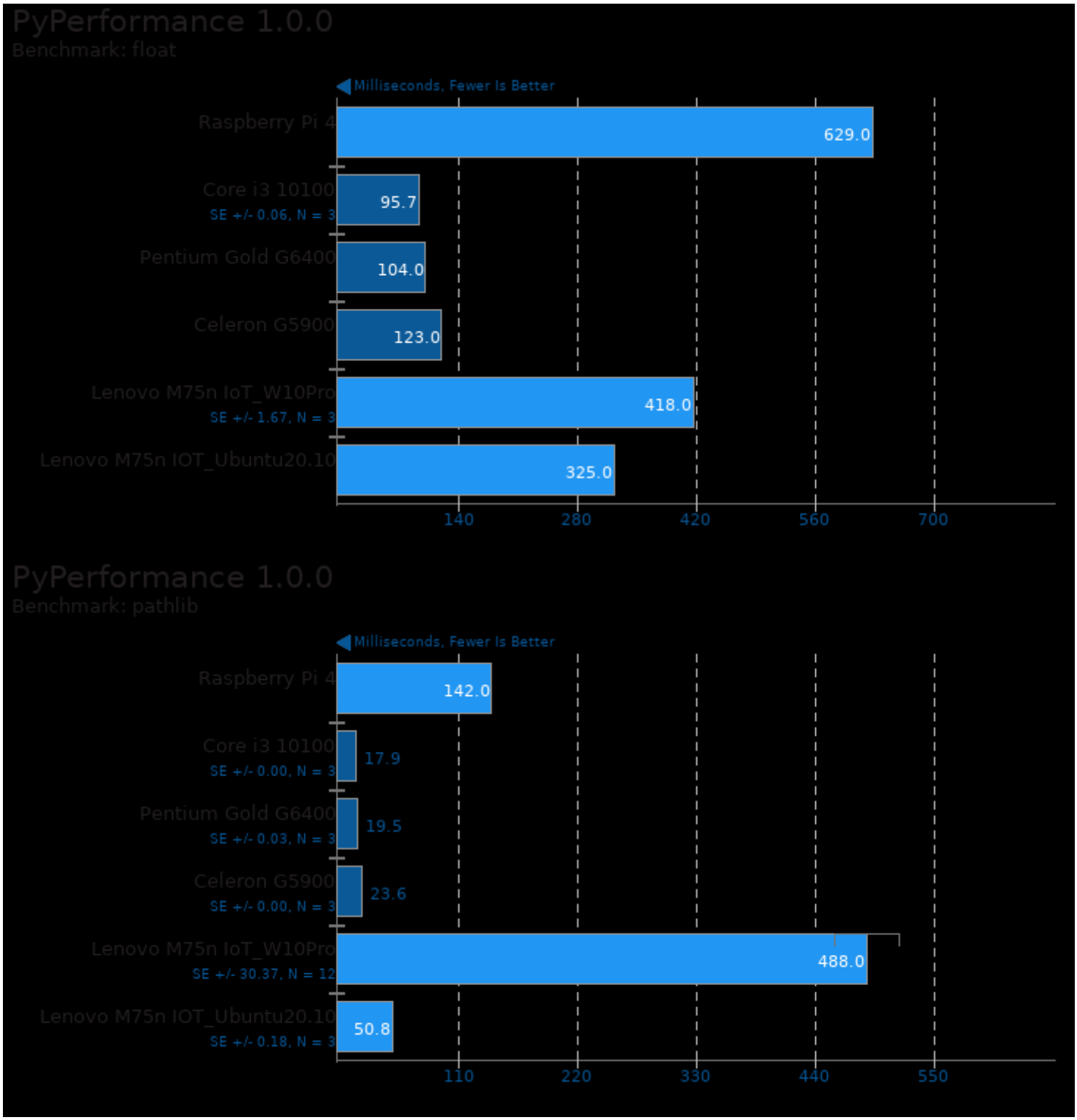

OCRMyPDF 8.0.1+dfsg
Processing 60 Page PDF Document
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.63, N = 3
376.43
Core i3 10100
SE +/- 0.03, N = 3
44.35
Pentium Gold G6400
SE +/- 0.03, N = 3
89.36
Celeron G5900
SE +/- 0.08, N = 3
121.33
80
160
240
320
400
OpenSSL 1.1.1
RSA 4096-bit Performance
Signs Per Second, More Is Better
Raspberry Pi 4
SE +/- 0.03, N = 3
97.6
Core i3 10100
SE +/- 2.27, N = 3
-m64
1253.2
Pentium Gold G6400
SE +/- 0.13, N = 3
-m64
389.3
Celeron G5900
SE +/- 1.05, N = 3
-m64
315.0
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.64, N = 3
-m64
183.2
300
600
900
1200
1500
1. (CC) gcc options: -pthread -O3 -lssl -lcrypto -ldl

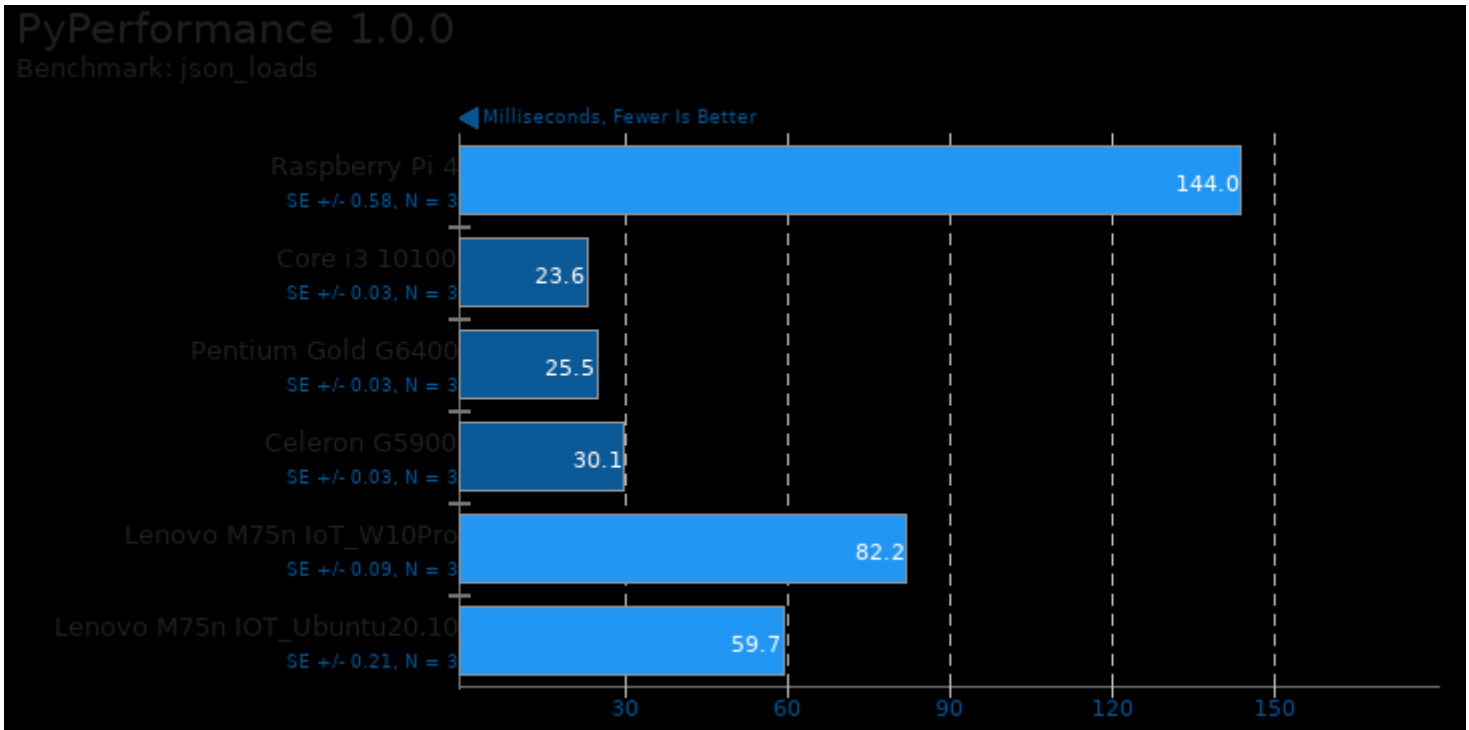

Perl Benchmarks
Test: Pod2html
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.00185361, N = 3
0.61497660
Core i3 10100
SE +/- 0.00010435, N = 3
0.10872912
Pentium Gold G6400
SE +/- 0.00029058, N = 3
0.11884498
Celeron G5900
SE +/- 0.00027382, N = 3
0.14005805
Lenovo M75n IoT_W10Pro
SE +/- 0.00276737, N = 3
0.53120483
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.00050757, N = 3
0.39327038
0.1384
0.2768
0.4152
0.5536
0.692
Perl Benchmarks
Test: Interpreter
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.00012453, N = 12
0.00714413
Core i3 10100
SE +/- 0.00006172, N = 15
0.00108894
Pentium Gold G6400
SE +/- 0.00000105, N = 3
0.00075872
Celeron G5900
SE +/- 0.00000210, N = 3
0.00101531
Lenovo M75n IoT_W10Pro
SE +/- 0.00131578, N = 12
0.02553182
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.00001132, N = 3
0.00205568
0.0057
0.0114
0.0171
0.0228
0.0285

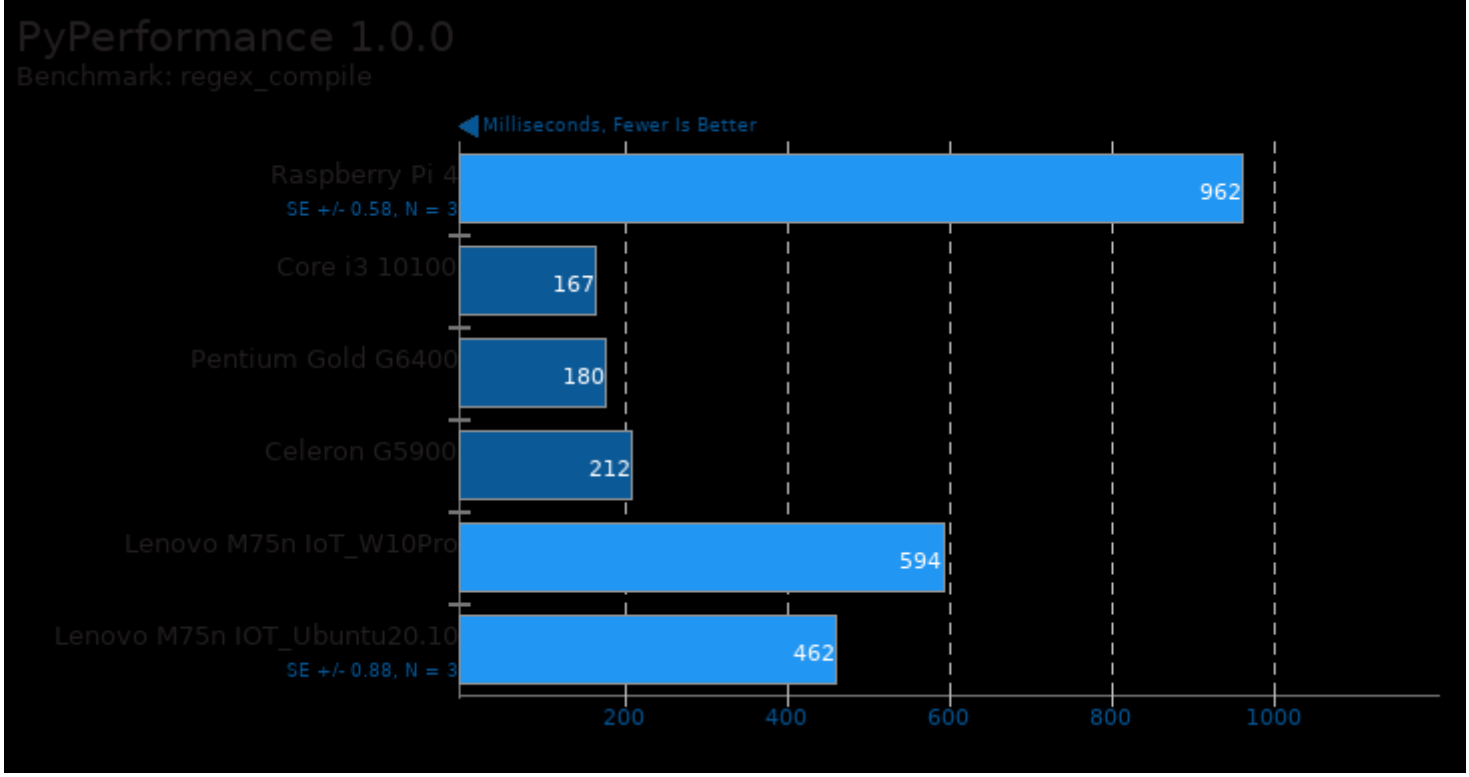

PHPBench 0.8.1
PHP Benchmark Suite
Score, More Is Better
Raspberry Pi 4
SE +/- 299.00, N = 3
102546
Core i3 10100
SE +/- 388.23, N = 3
729845
Pentium Gold G6400
SE +/- 1130.88, N = 3
668540
Celeron G5900
SE +/- 406.11, N = 3
568837
Lenovo M75n IoT_W10Pro
SE +/- 62.01, N = 3
124660
Lenovo M75n IOT_Ubuntu20.10
SE +/- 424.68, N = 3
276629
160K
320K
480K
640K
800K
PolyBench-C 4.2
Test: Covariance Computation
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.012, N = 3
31.015
Celeron G5900
SE +/- 0.004, N = 3
2.168
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.033, N = 3
6.498
7
14
21
28
35
1. (CC) gcc options: -O3 -march=native


PolyBench-C 4.2
Test: Correlation Computation
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.010, N = 3
31.021
Celeron G5900
SE +/- 0.005, N = 3
2.170
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.041, N = 3
6.444
7
14
21
28
35
1. (CC) gcc options: -O3 -march=native
PolyBench-C 4.2
Test: 3 Matrix Multiplications
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.006, N = 3
24.910
Core i3 10100
SE +/- 0.003, N = 3
3.338
Pentium Gold G6400
SE +/- 0.003, N = 3
3.832
Celeron G5900
SE +/- 0.003, N = 3
4.446
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.030, N = 3
7.679
6
12
18
24
30
1. (CC) gcc options: -O3 -march=native

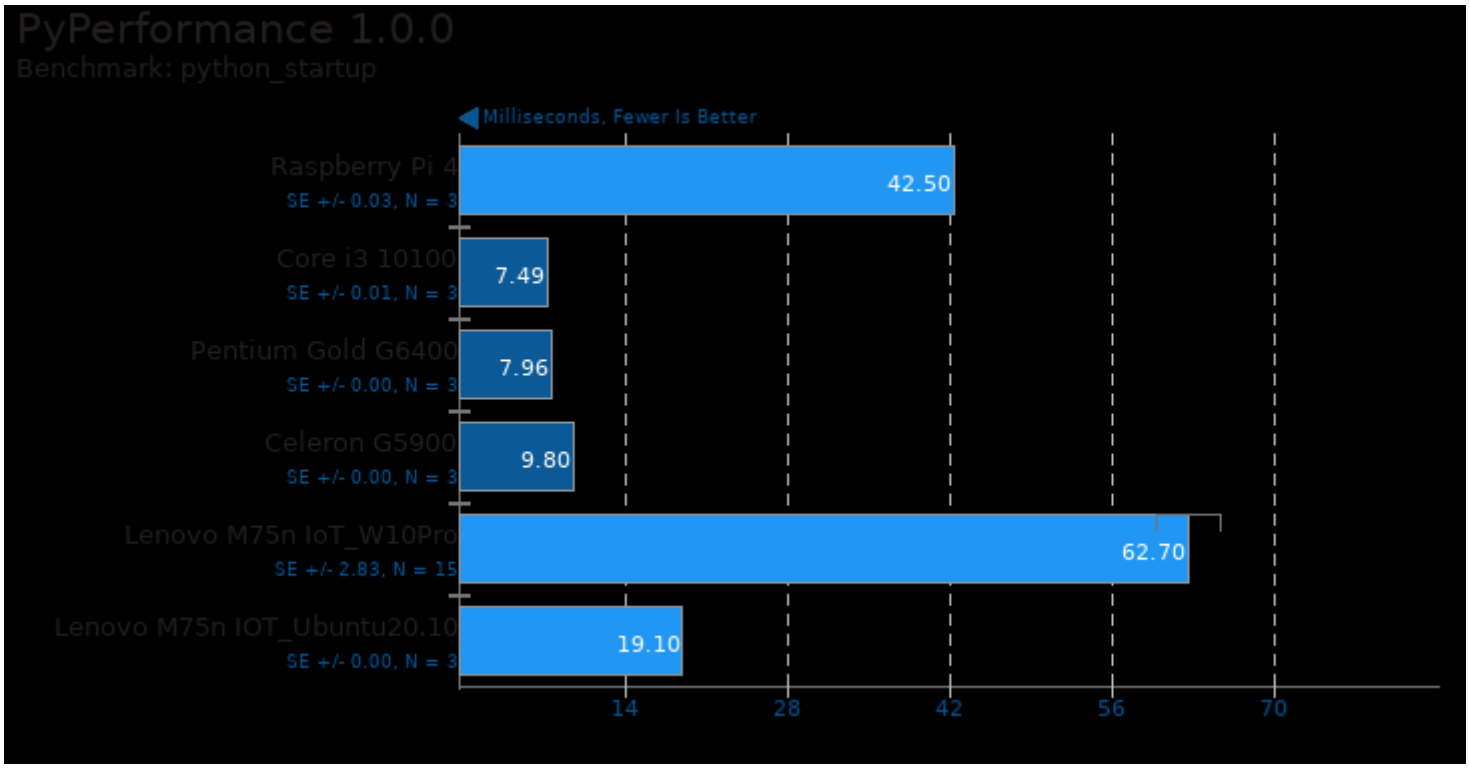

PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
Raspberry Pi 4
SE +/- 6.69, N = 3
5235
Core i3 10100
945
Pentium Gold G6400
SE +/- 2.73, N = 3
1020
Celeron G5900
SE +/- 3.21, N = 3
1199
Lenovo M75n IoT_W10Pro
SE +/- 8.50, N = 3
4221
Lenovo M75n IOT_Ubuntu20.10
SE +/- 4.67, N = 3
2340
1100
2200
3300
4400
5500
PyPerformance 1.0.0
Benchmark: 2to3
Milliseconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.00, N = 3
1.79
Core i3 10100
304.00
Pentium Gold G6400
328.00
Celeron G5900
397.00
Lenovo M75n IoT_W10Pro
SE +/- 0.07, N = 10
1.23
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.67, N = 3
904.00
200
400
600
800
1000

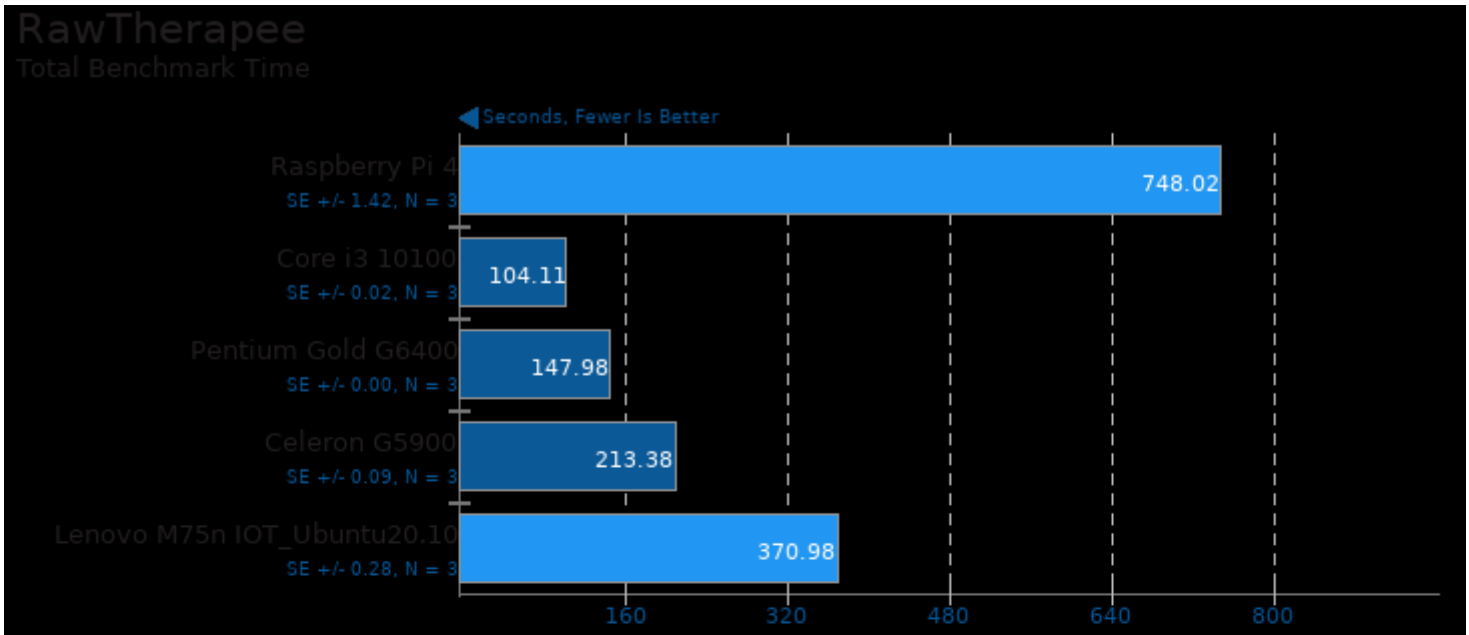

PyPerformance 1.0.0
Benchmark: float
Milliseconds, Fewer Is Better
Raspberry Pi 4
629.0
Core i3 10100
SE +/- 0.06, N = 3
95.7
Pentium Gold G6400
104.0
Celeron G5900
123.0
Lenovo M75n IoT_W10Pro
SE +/- 1.67, N = 3
418.0
Lenovo M75n IOT_Ubuntu20.10
325.0
140
280
420
560
700
PyPerformance 1.0.0
Benchmark: pathlib
Milliseconds, Fewer Is Better
Raspberry Pi 4
142.0
Core i3 10100
SE +/- 0.00, N = 3
17.9
Pentium Gold G6400
SE +/- 0.03, N = 3
19.5
Celeron G5900
SE +/- 0.00, N = 3
23.6
Lenovo M75n IoT_W10Pro
SE +/- 30.37, N = 12
488.0
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.18, N = 3
50.8
110
220
330
440
550


PyPerformance 1.0.0
Benchmark: json_loads
Milliseconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.58, N = 3
144.0
Core i3 10100
SE +/- 0.03, N = 3
23.6
Pentium Gold G6400
SE +/- 0.03, N = 3
25.5
Celeron G5900
SE +/- 0.03, N = 3
30.1
Lenovo M75n IoT_W10Pro
SE +/- 0.09, N = 3
82.2
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.21, N = 3
59.7
30
60
90
120
150


PyPerformance 1.0.0
Benchmark: regex_compile
Milliseconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.58, N = 3
962
Core i3 10100
167
Pentium Gold G6400
180
Celeron G5900
212
Lenovo M75n IoT_W10Pro
594
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.88, N = 3
462
200
400
600
800
1000

Raspberry Pi 4 vs. Intel Comet Lake





1. Raspberry Pi 4: RawTherapee, version 5.5, command line.
An advanced, cross-platform program for developing raw photos.

Website: http://www.rawtherapee.com/
Documentation: http://rawpedia.rawtherapee.com/
Forum: https://discuss.pixls.us/c/software/rawtherapee
Code and bug reports: https://github.com/Beep6581/RawTherapee

Symbols:
<Chevrons> indicate parameters you can change.
[Square brackets] mean the parameter is optional.
The pipe symbol | indicates a choice of one or the other.
The dash symbol - denotes a range of possible values from one to the other.

Usage:
rawtherapee-cli -c <dir>|<files> Convert files in batch with default parameters.
rawtherapee-cli <other options> -c <dir>|<files> Convert files in batch with your own settings.

Options:
rawtherapee-cli[-o <output>|-O <output>] [-q] [-a] [-s|-S] [-p <one.pp3> [-p <two.pp3> ...]] [-d] [-j[1-100] -js<1-3> | -t[z] -b<8|16|16f|32> | -n -b<8

-c <files> Specify one or more input files or folders.
When specifying folders, Rawtherapee will look for image file types which comply
with the selected extensions (see also '-a').
-c must be the last option.

-o <file>|<dir> Set output file or folder.
Saves output file alongside input file if -o is not specified.

-O <file>|<dir> Set output file or folder and copy pp3 file into it.

-q Quick-start mode. Does not load cached files to speedup start time.

-a Process all supported image file types when specifying a folder, even those
not currently selected in Preferences > File Browser > Parsed Extensions.

-s Use the existing sidecar file to pull the processing parameters,
and save the output to a new one should be a pp3 extension file in the same folder.
If the sidecar file does not exist, neutral values will be used.

-S Like -s but skip if the sidecar file does not exist.

-p <file.pp3> Specify processing profile to be used for all conversions.
It can be specified multiple times to build a queue of "-p <file.pp3>" options as you like,
each will be built on top of the previous one, as explained below.
Use the default raw or non-raw processing profile as setup in
Preferences > Image Processing > Default Processing Profile

-j[1-100] Specify output to be JPEG (default, if -t and -n are not set).
Optionally specify compression 1-100 (default value: 92).

-js<1-3> Specify the JPEG chroma subsampling parameter, where:
1 = Best compression: 2x2, 1x1, 1x1 (4:2:0)
Chroma halved vertically and horizontally.
2 = Balanced (default): 2x1, 1x1, 1x1 (4:2:2)
Chroma halved horizontally.
3 = Best quality: 1x1, 1x1, 1x1 (4:4:4)

-t[z] Specify output to be uncompressed TIFF.
Optionally specify 'z' for deflate compression.

-b<8|16|16f|32> Specify bit depth per channel:
8 = 8 bit integer. Applies to JPEG, PNG and TIFF. Default for JPEG and PNG.
16 = 16 bit integer. Applies to TIFF and PNG. Default for TIFF.
16f = 16 bit float. Applies to TIFF.
32 = 32 bit float. Applies to TIFF.

-n Specify output to be compressed PNG.

2. Core i3 10100: RawTherapee, version 5.5, command line.
An advanced, cross-platform program for developing raw photos.

Website: http://www.rawtherapee.com/
Documentation: http://rawpedia.rawtherapee.com/
Forum: https://discuss.pixls.us/c/software/rawtherapee
Code and bug reports: https://github.com/Beep6581/RawTherapee

Symbols:
<Chevrons> indicate parameters you can change.
[Square brackets] mean the parameter is optional.
The pipe symbol | indicates a choice of one or the other.
The dash symbol - denotes a range of possible values from one to the other.

Usage:
rawtherapee-cli -c <dir>|<files> Convert files in batch with default parameters.
rawtherapee-cli <other options> -c <dir>|<files> Convert files in batch with your own settings.

Options:
rawtherapee-cli[-o <output>|-O <output>] [-q] [-a] [-s|-S] [-p <one.pp3> [-p <two.pp3> ...]] [-d] [-j[1-100] -js<1-3> | -t[z] -b<8|16|16f|32> | -n -b<8

-c <files> Specify one or more input files or folders.
When specifying folders, Rawtherapee will look for image file types which comply
with the selected extensions (see also '-a').
-c must be the last option.

-o <file>|<dir> Set output file or folder.
Saves output file alongside input file if -o is not specified.

-O <file>|<dir> Set output file or folder and copy pp3 file into it.

-q Quick-start mode. Does not load cached files to speedup start time.

-a Process all supported image file types when specifying a folder, even those
not currently selected in Preferences > File Browser > Parsed Extensions.

-s Use the existing sidecar file to pull the processing parameters,
and save the output to a new one should be a pp3 extension file in the same folder.
If the sidecar file does not exist, neutral values will be used.

-S Like -s but skip if the sidecar file does not exist.

-p <file.pp3> Specify processing profile to be used for all conversions.
It can be specified multiple times to build a queue of "-p <file.pp3>" options as you like,
each will be built on top of the previous one, as explained below.
Use the default raw or non-raw processing profile as setup in
Preferences > Image Processing > Default Processing Profile

-j[1-100] Specify output to be JPEG (default, if -t and -n are not set).
Optionally specify compression 1-100 (default value: 92).

-js<1-3> Specify the JPEG chroma subsampling parameter, where:
1 = Best compression: 2x2, 1x1, 1x1 (4:2:0)
Chroma halved vertically and horizontally.
2 = Balanced (default): 2x1, 1x1, 1x1 (4:2:2)
Chroma halved horizontally.
3 = Best quality: 1x1, 1x1, 1x1 (4:4:4)

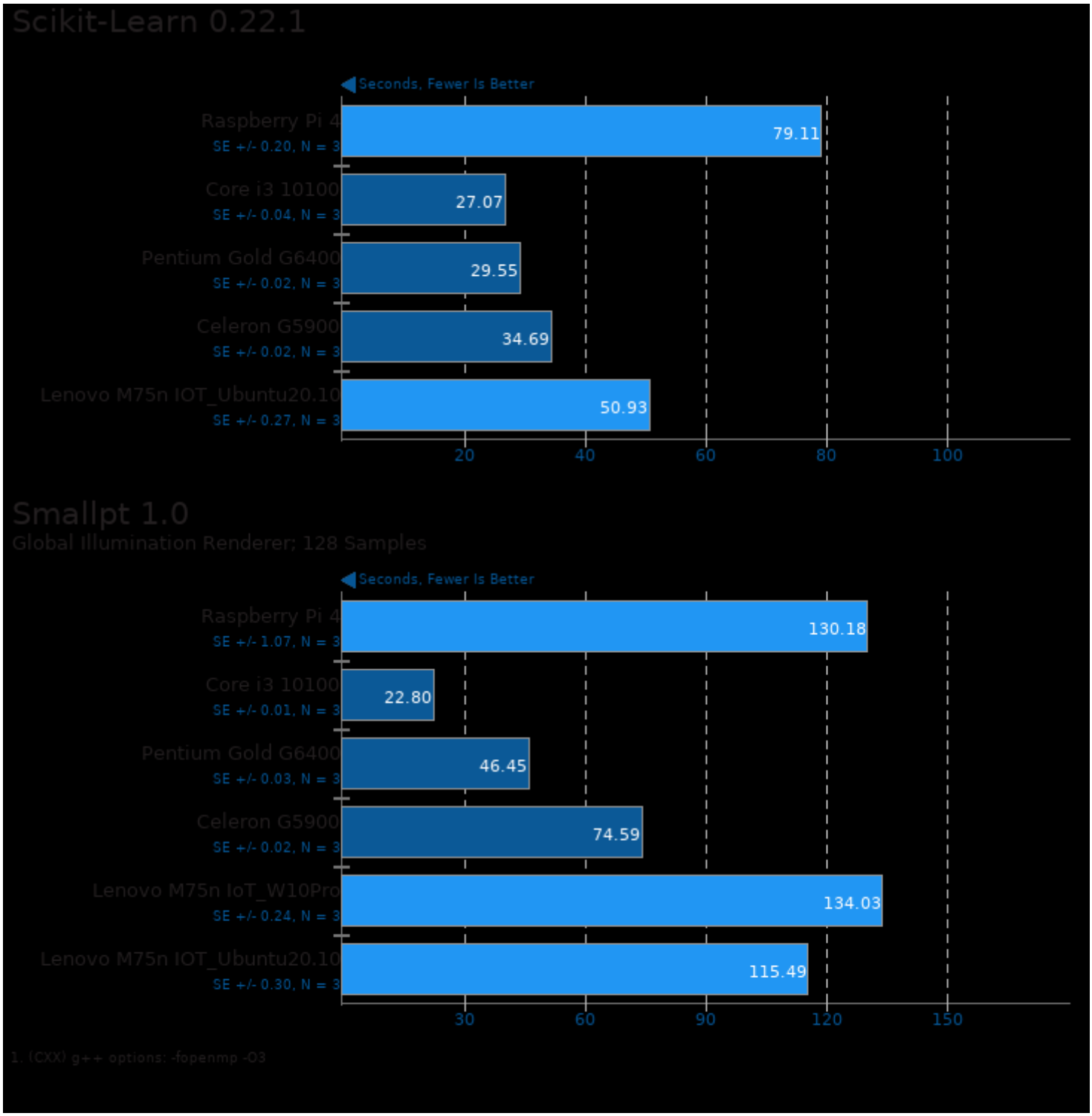
-t[z] Specify output to be uncompressed TIFF.
Optionally specify 'z' for deflate compression.

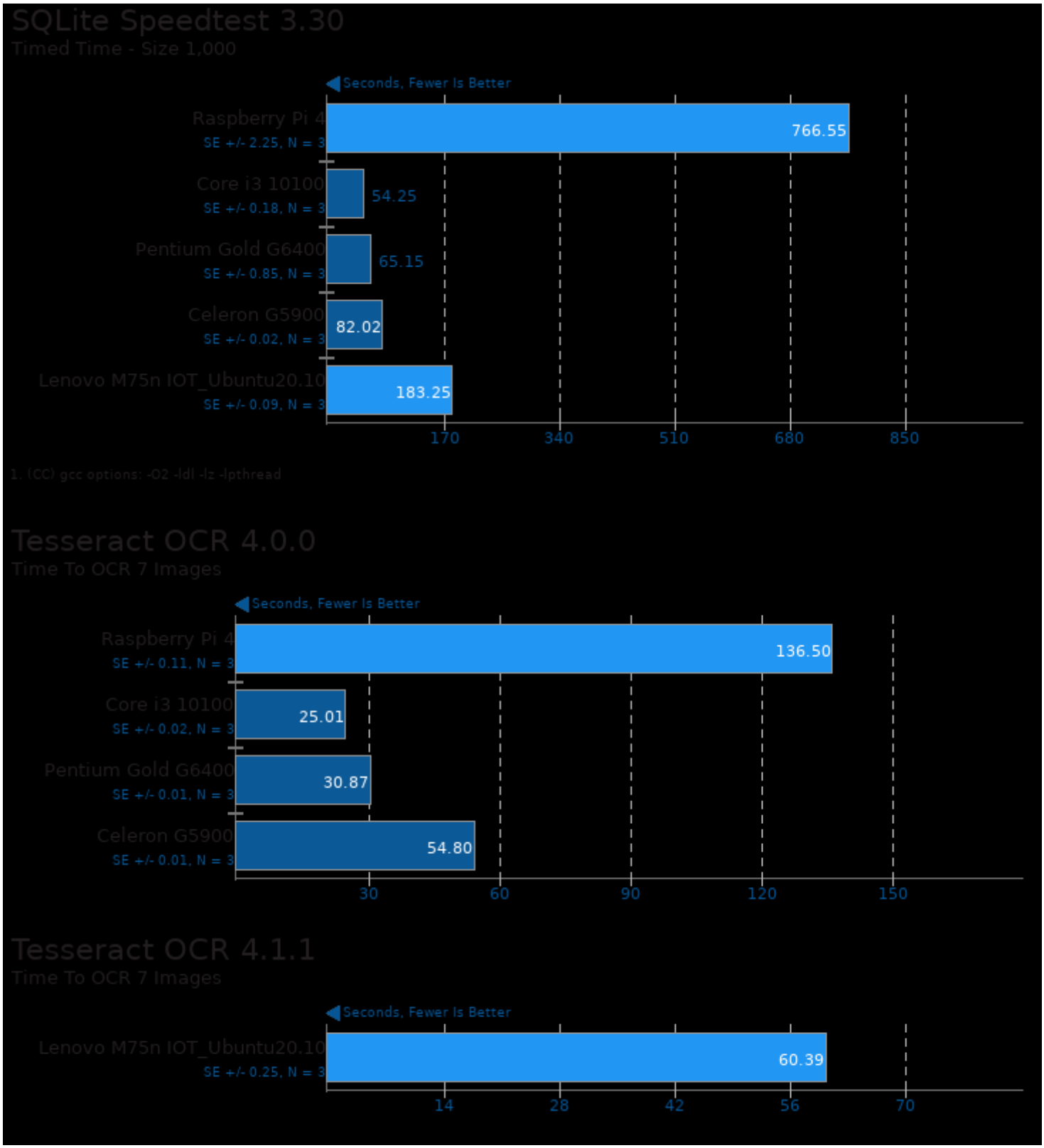
-b<8|16|16f|32> Specify bit depth per channel:
8 = 8 bit integer. Applies to JPEG, PNG and TIFF. Default for JPEG and PNG.
16 = 16 bit integer. Applies to TIFF and PNG. Default for TIFF.
16f = 16 bit float. Applies to TIFF.
32 = 32 bit float. Applies to TIFF.

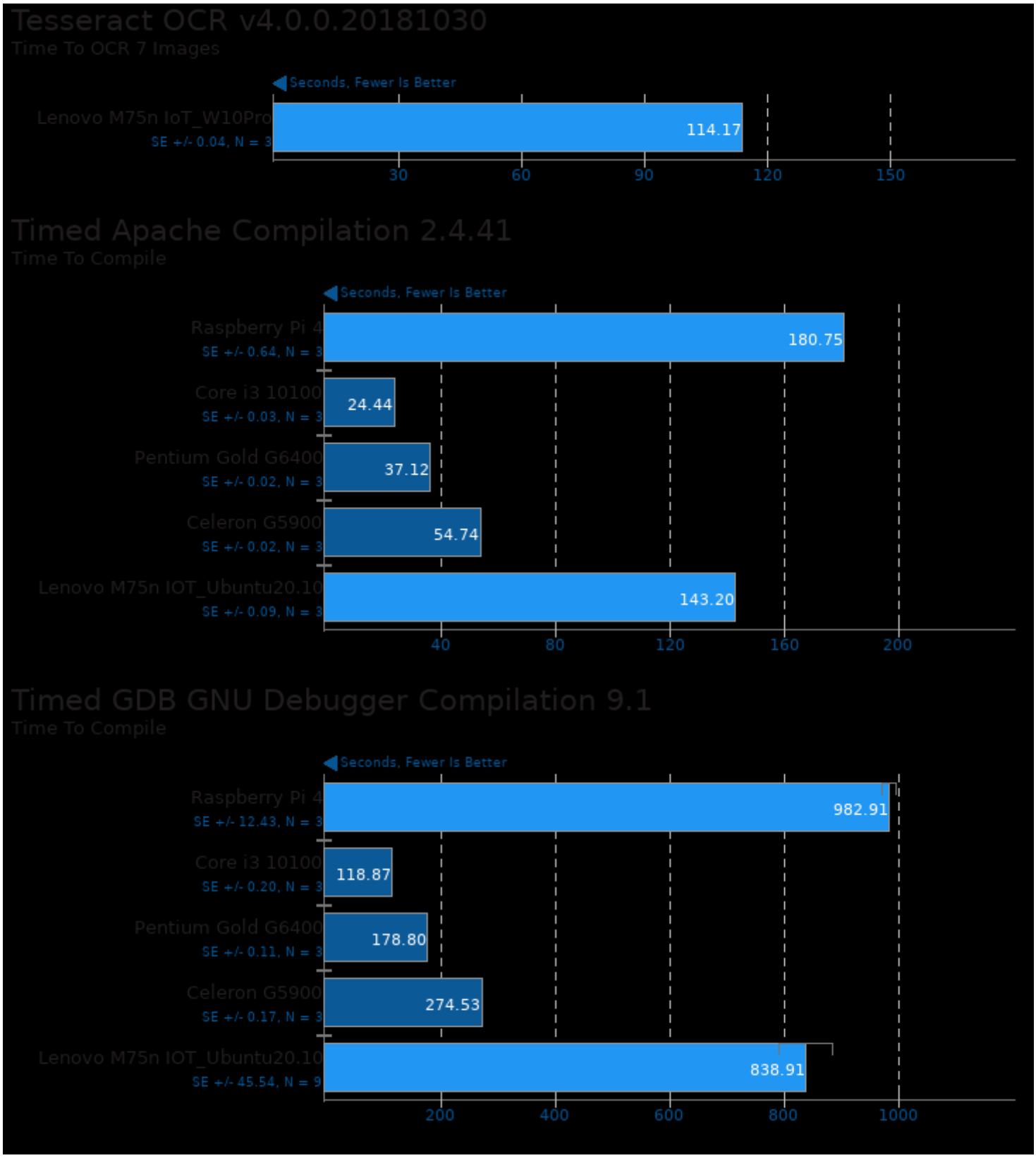
-n Specify output to be compressed PNG.

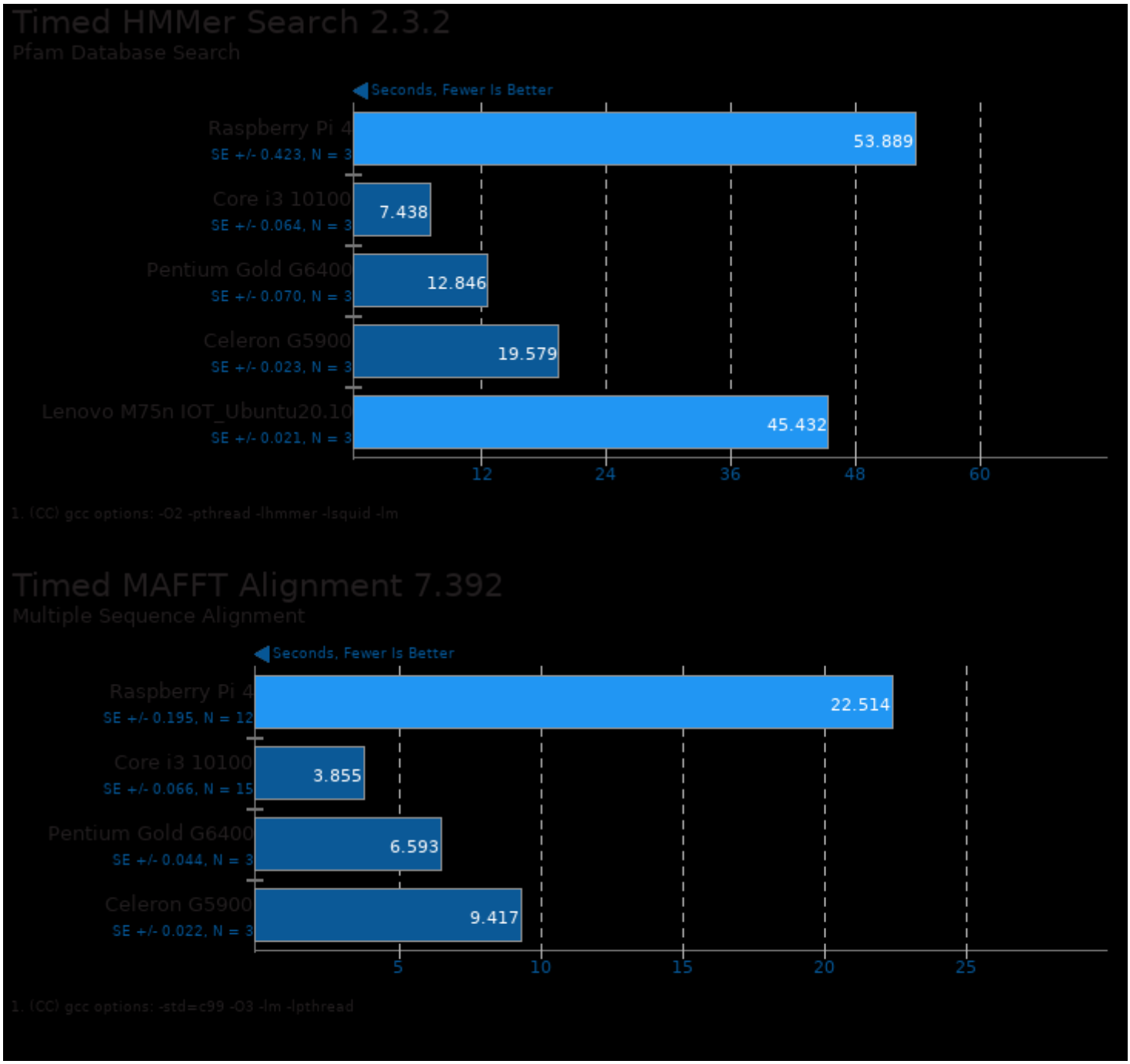
3. Pentium Gold G6400: RawTherapee, version 5.5, command line.
An advanced, cross-platform program for developing raw photos.

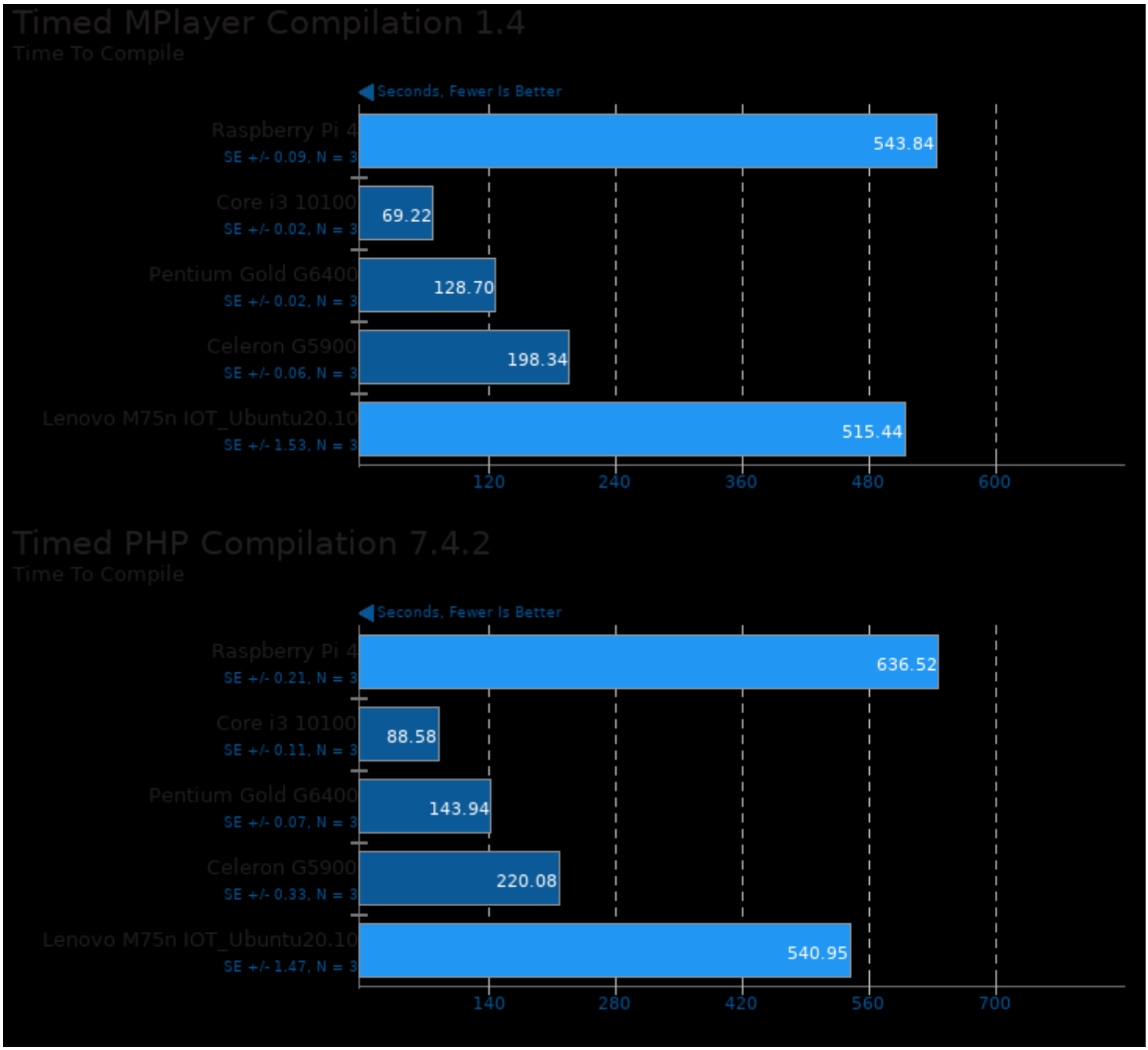
Website: http://www.rawtherapee.com/
Documentation: http://rawpedia.rawtherapee.com/
Forum: https://discuss.pixls.us/c/software/rawtherapee
Code and bug reports: https://github.com/Beep6581/RawTherapee

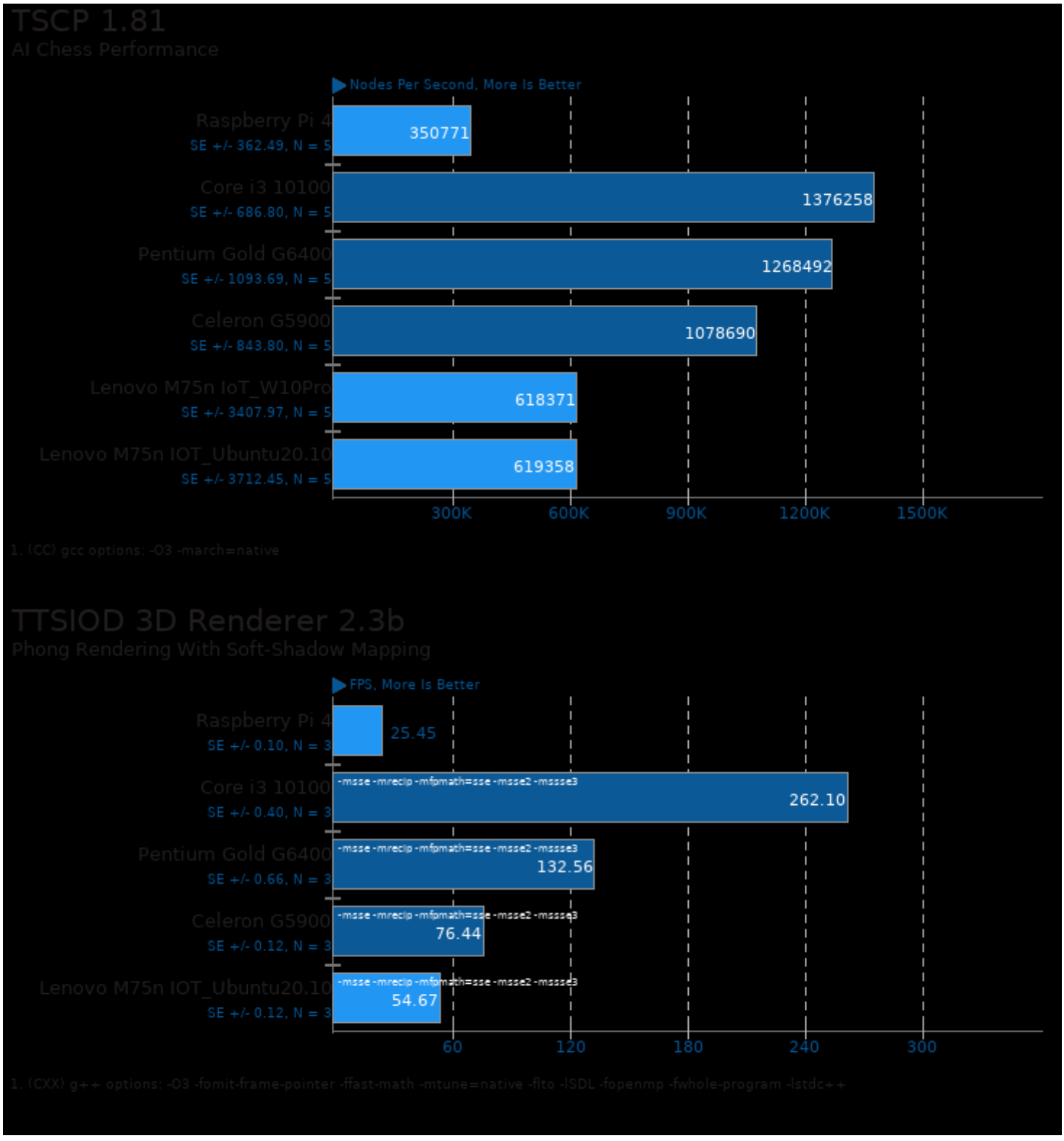

Scikit-Learn 0.22.1
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.20, N = 3
79.11
Core i3 10100
SE +/- 0.04, N = 3
27.07
Pentium Gold G6400
SE +/- 0.02, N = 3
29.55
Celeron G5900
SE +/- 0.02, N = 3
34.69
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.27, N = 3
50.93
20
40
60
80
100
Smallpt 1.0
Global Illumination Renderer; 128 Samples
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 1.07, N = 3
130.18
Core i3 10100
SE +/- 0.01, N = 3
22.80
Pentium Gold G6400
SE +/- 0.03, N = 3
46.45
Celeron G5900
SE +/- 0.02, N = 3
74.59
Lenovo M75n IoT_W10Pro
SE +/- 0.24, N = 3
134.03
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.30, N = 3
115.49
30
60
90
120
150
1. (CXX) g++ options: -fopenmp -O3

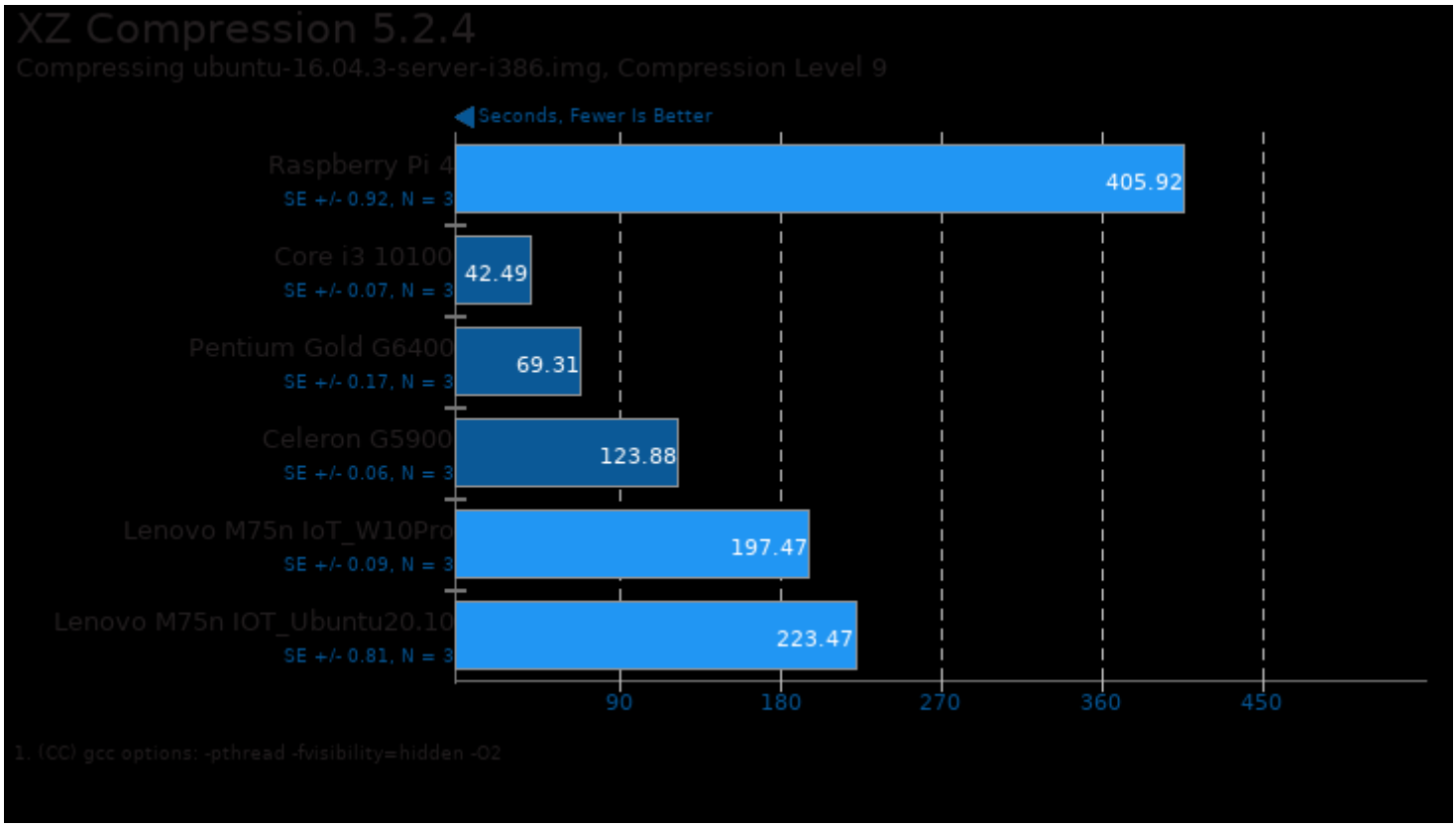

SQLite Speedtest 3.30
Timed Time - Size 1,000
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 2.25, N = 3
766.55
Core i3 10100
SE +/- 0.18, N = 3
54.25
Pentium Gold G6400
SE +/- 0.85, N = 3
65.15
Celeron G5900
SE +/- 0.02, N = 3
82.02
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.09, N = 3
183.25
170
340
510
680
850
1. (CC) gcc options: -O2 -ldl -lz -lpthread
Tesseract OCR 4.0.0
Time To OCR 7 Images
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.11, N = 3
136.50
Core i3 10100
SE +/- 0.02, N = 3
25.01
Pentium Gold G6400
SE +/- 0.01, N = 3
30.87
Celeron G5900
SE +/- 0.01, N = 3
54.80
30
60
90
120
150
Tesseract OCR 4.1.1
Time To OCR 7 Images
Seconds, Fewer Is Better
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.25, N = 3
60.39
14
28
42
56
70


Tesseract OCR v4.0.0.20181030
Time To OCR 7 Images
Seconds, Fewer Is Better
Lenovo M75n IoT_W10Pro
SE +/- 0.04, N = 3
114.17
30
60
90
120
150
Timed Apache Compilation 2.4.41
Time To Compile
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.64, N = 3
180.75
Core i3 10100
SE +/- 0.03, N = 3
24.44
Pentium Gold G6400
SE +/- 0.02, N = 3
37.12
Celeron G5900
SE +/- 0.02, N = 3
54.74
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.09, N = 3
143.20
40
80
120
160
200
Timed GDB GNU Debugger Compilation 9.1
Time To Compile
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 12.43, N = 3
982.91
Core i3 10100
SE +/- 0.20, N = 3
118.87
Pentium Gold G6400
SE +/- 0.11, N = 3
178.80
Celeron G5900
SE +/- 0.17, N = 3
274.53
Lenovo M75n IOT_Ubuntu20.10
SE +/- 45.54, N = 9
838.91
200
400
600
800
1000

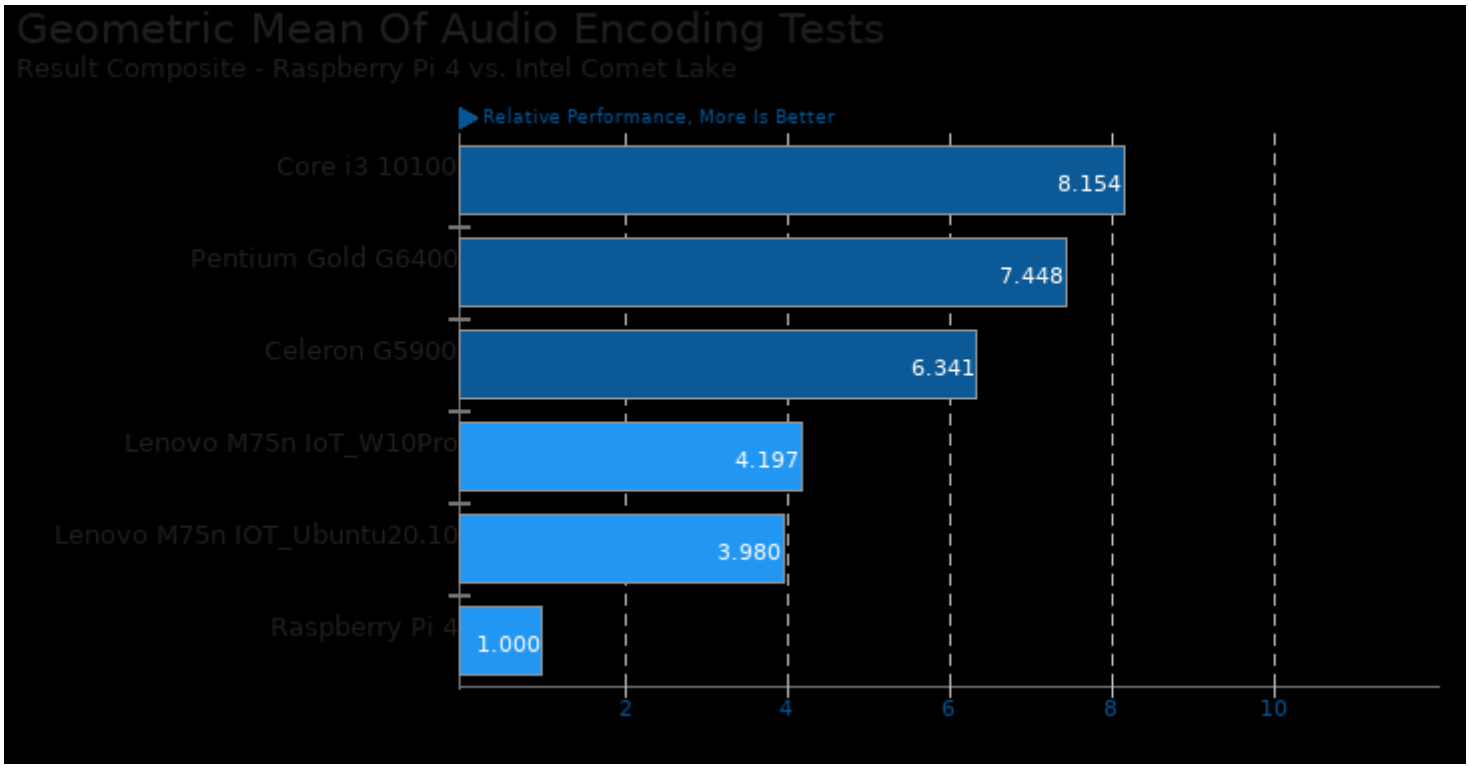

Timed HMMer Search 2.3.2
Pfam Database Search
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.423, N = 3
53.889
Core i3 10100
SE +/- 0.064, N = 3
7.438
Pentium Gold G6400
SE +/- 0.070, N = 3
12.846
Celeron G5900
SE +/- 0.023, N = 3
19.579
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.021, N = 3
45.432
12
24
36
48
60
1. (CC) gcc options: -O2 -pthread -lhmmer -lsquid -lm
Timed MAFFT Alignment 7.392
Multiple Sequence Alignment
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.195, N = 12
22.514
Core i3 10100
SE +/- 0.066, N = 15
3.855
Pentium Gold G6400
SE +/- 0.044, N = 3
6.593
Celeron G5900
SE +/- 0.022, N = 3
9.417
5
10
15
20
25
1. (CC) gcc options: -std=c99 -O3 -lm -lpthread


Timed MPlayer Compilation 1.4
Time To Compile
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.09, N = 3
543.84
Core i3 10100
SE +/- 0.02, N = 3
69.22
Pentium Gold G6400
SE +/- 0.02, N = 3
128.70
Celeron G5900
SE +/- 0.06, N = 3
198.34
Lenovo M75n IOT_Ubuntu20.10
SE +/- 1.53, N = 3
515.44
120
240
360
480
600
Timed PHP Compilation 7.4.2
Time To Compile
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.21, N = 3
636.52
Core i3 10100
SE +/- 0.11, N = 3
88.58
Pentium Gold G6400
SE +/- 0.07, N = 3
143.94
Celeron G5900
SE +/- 0.33, N = 3
220.08
Lenovo M75n IOT_Ubuntu20.10
SE +/- 1.47, N = 3
540.95
140
280
420
560
700

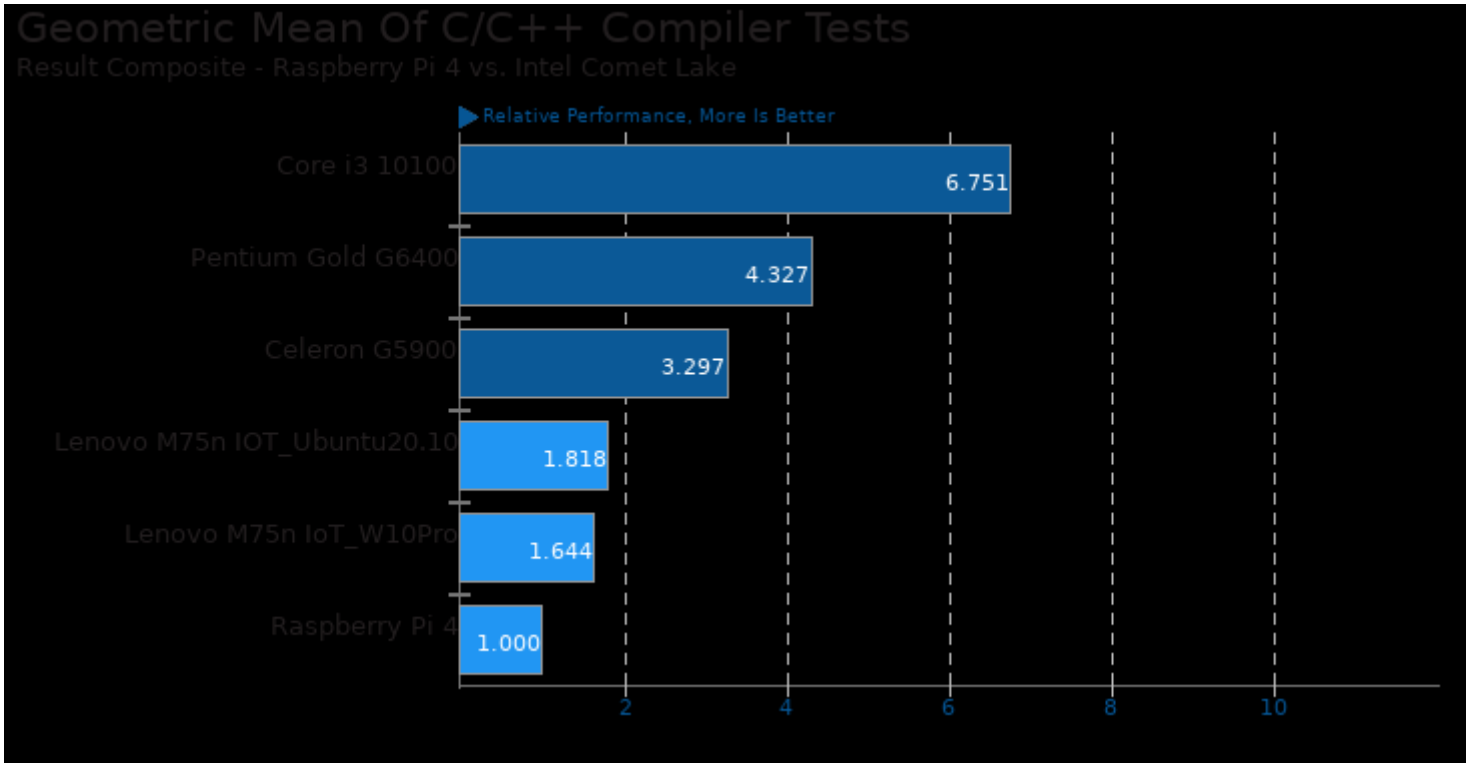

TSCP 1.81
AI Chess Performance
Nodes Per Second, More Is Better
Raspberry Pi 4
SE +/- 362.49, N = 5
350771
Core i3 10100
SE +/- 686.80, N = 5
1376258
Pentium Gold G6400
SE +/- 1093.69, N = 5
1268492
Celeron G5900
SE +/- 843.80, N = 5
1078690
Lenovo M75n IoT_W10Pro
SE +/- 3407.97, N = 5
618371
Lenovo M75n IOT_Ubuntu20.10
SE +/- 3712.45, N = 5
619358
300K
600K
900K
1200K
1500K
1. (CC) gcc options: -O3 -march=native
TTSIOD 3D Renderer 2.3b
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
Raspberry Pi 4
SE +/- 0.10, N = 3
25.45
Core i3 10100
SE +/- 0.40, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
262.10
Pentium Gold G6400
SE +/- 0.66, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
132.56
Celeron G5900
SE +/- 0.12, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
76.44
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.12, N = 3
-msse -mrecip -mfpmath=sse -msse2 -mssse3
54.67
60
120
180
240
300
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -lSDL -fopenmp -fwhole-program -lstdc++


XZ Compression 5.2.4
Compressing ubuntu-16.04.3-server-i386.img, Compression Level 9
Seconds, Fewer Is Better
Raspberry Pi 4
SE +/- 0.92, N = 3
405.92
Core i3 10100
SE +/- 0.07, N = 3
42.49
Pentium Gold G6400
SE +/- 0.17, N = 3
69.31
Celeron G5900
SE +/- 0.06, N = 3
123.88
Lenovo M75n IoT_W10Pro
SE +/- 0.09, N = 3
197.47
Lenovo M75n IOT_Ubuntu20.10
SE +/- 0.81, N = 3
223.47
90
180
270
360
450
1. (CC) gcc options: -pthread -fvisibility=hidden -O2

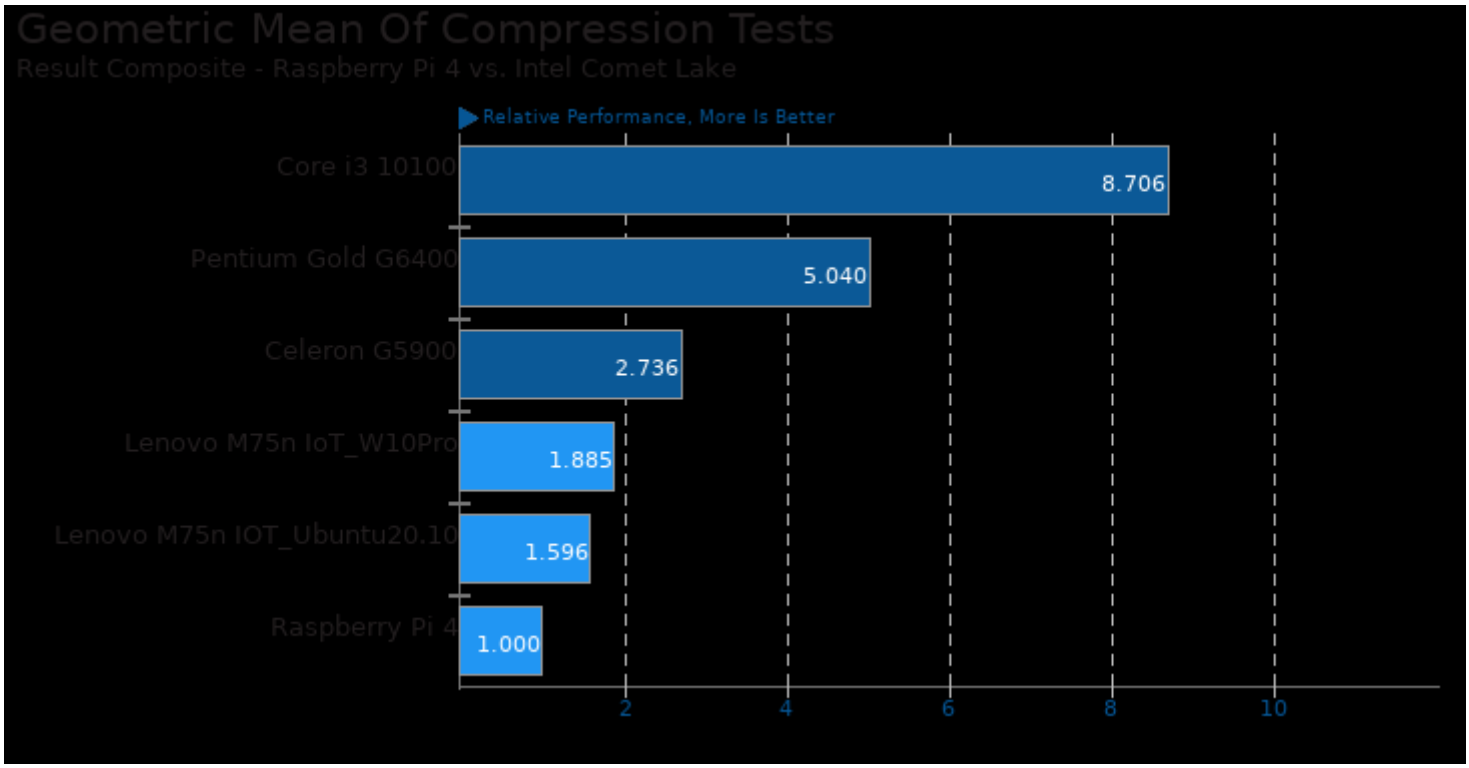
These geometric means are based upon test groupings / test suites for this result file.



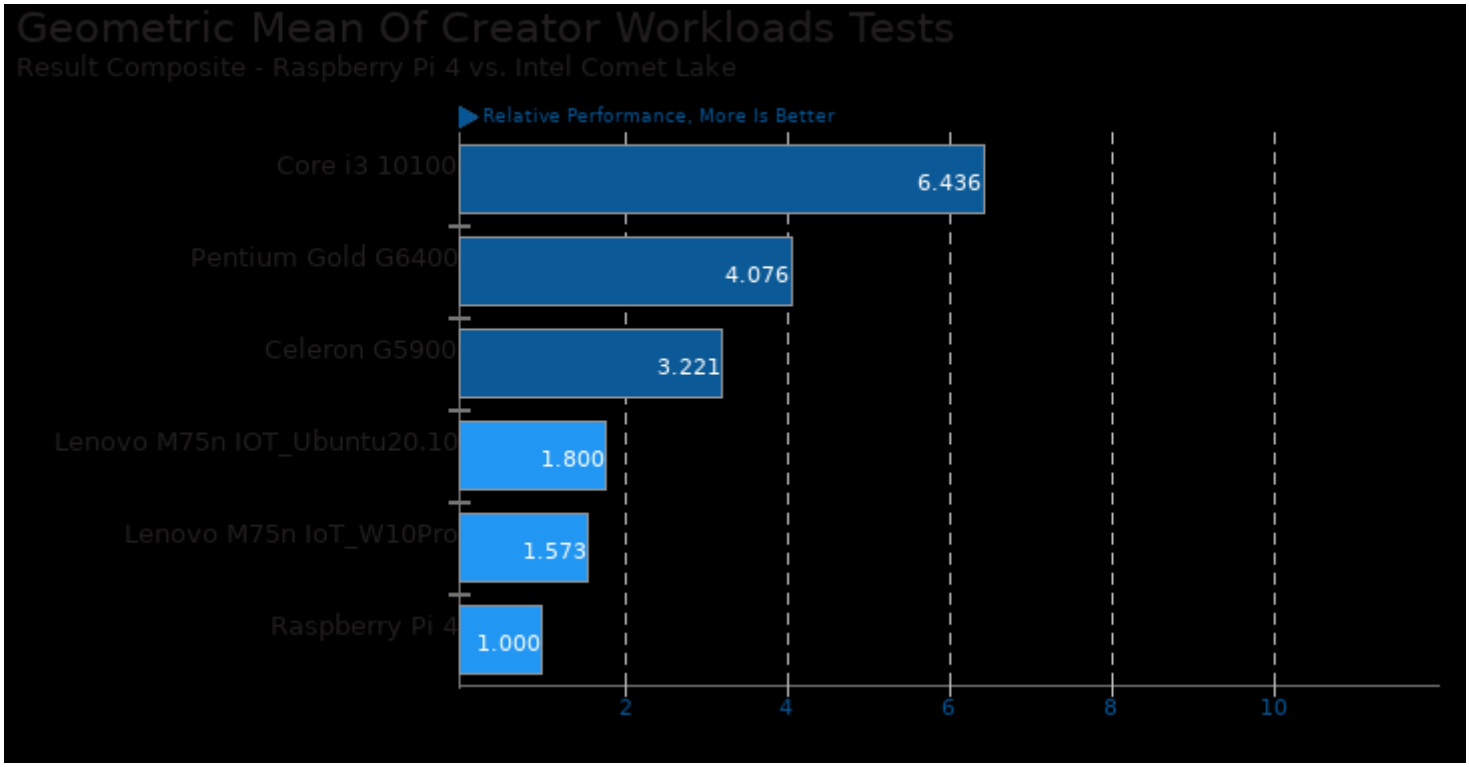
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



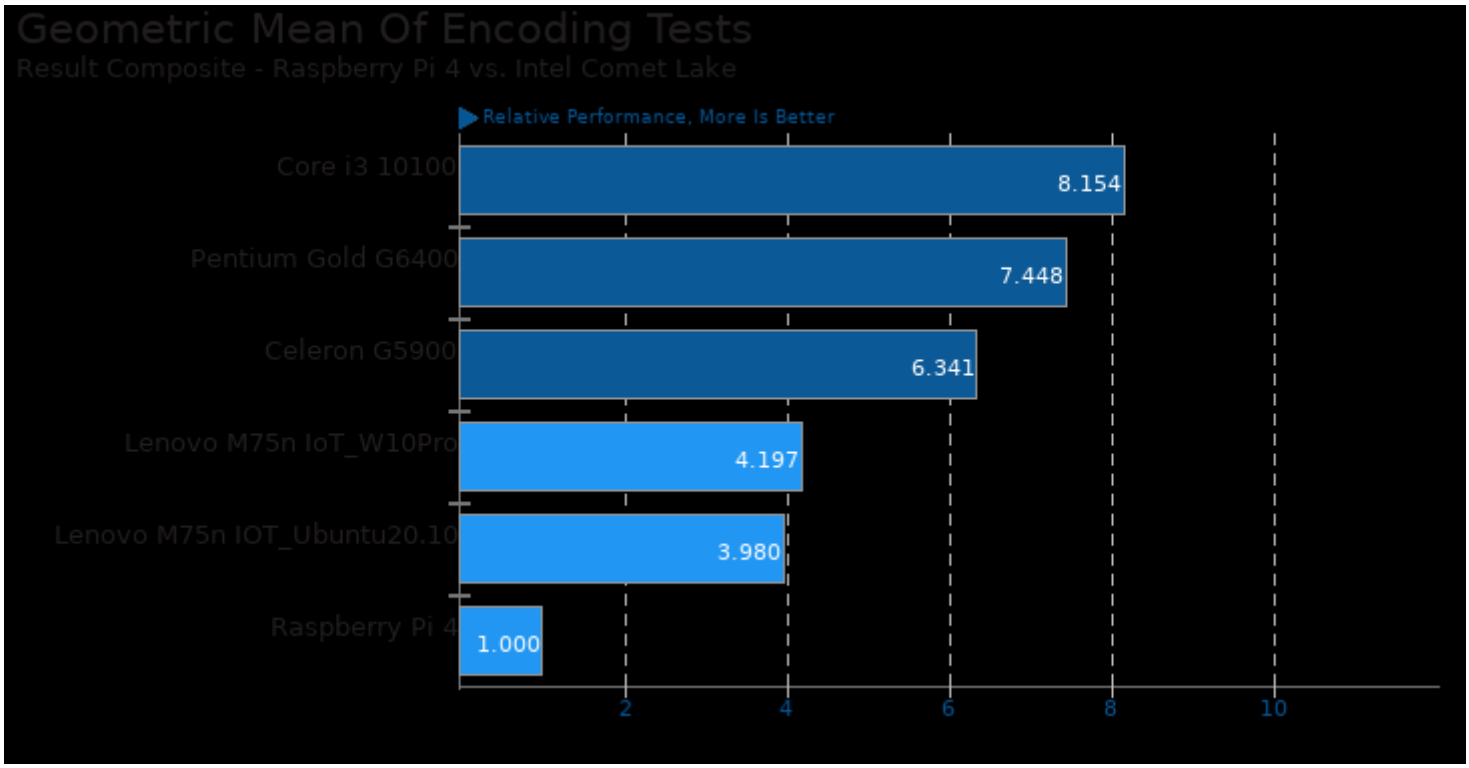
Geometric mean based upon tests: pts/mafft, pts/aobench, pts/tscp, pts/graphics-magick, pts/hmmer, pts/build-php, pts/c-ray, pts/compress-7zip, pts/encode-mp3, pts/encode-flac, pts/sqlite-speedtest, pts/compress-xz, pts/openssl, pts/lammps, pts/aircrack-ng, pts/build-gdb, pts/build-apache and pts/build-mplayer



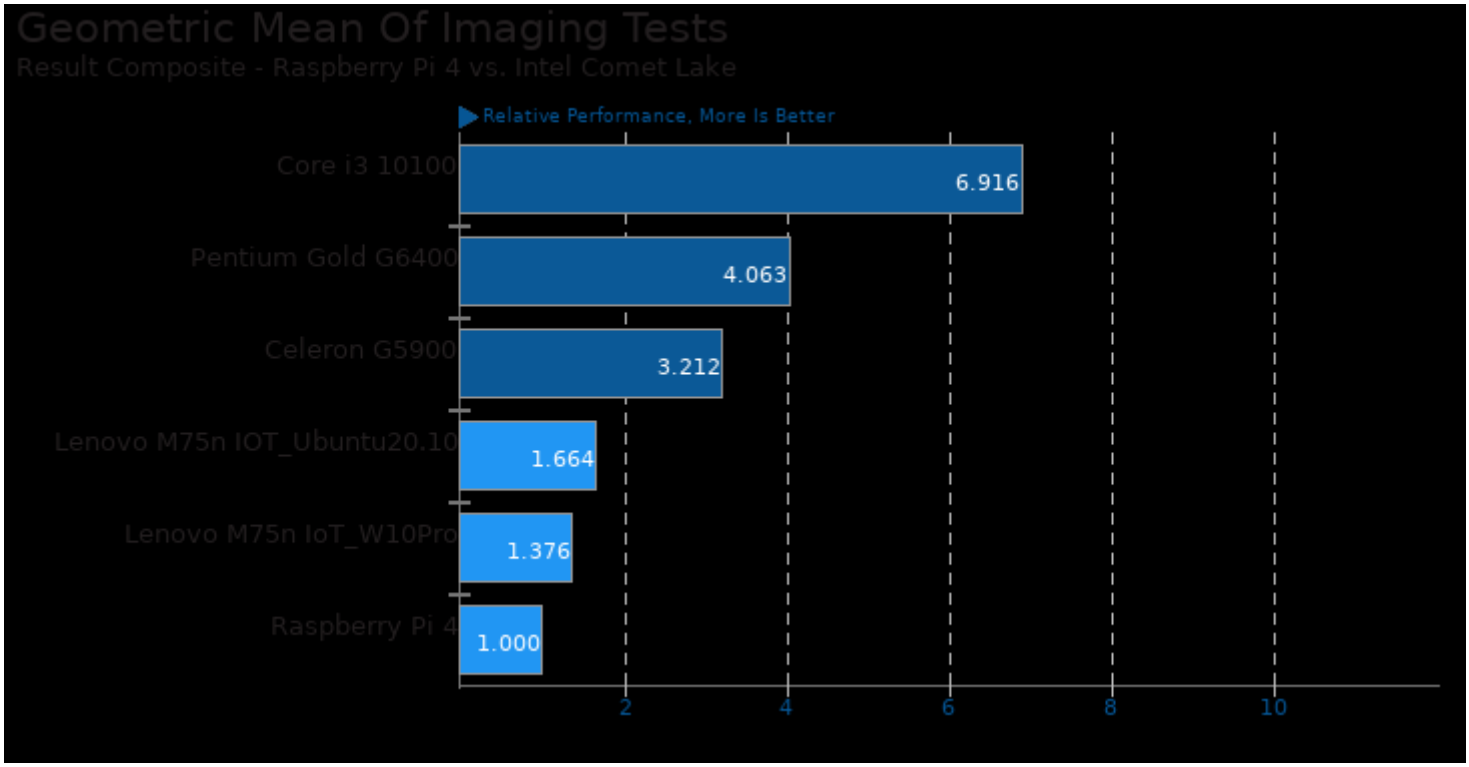
Geometric mean based upon tests: pts/compress-7zip and pts/compress-xz



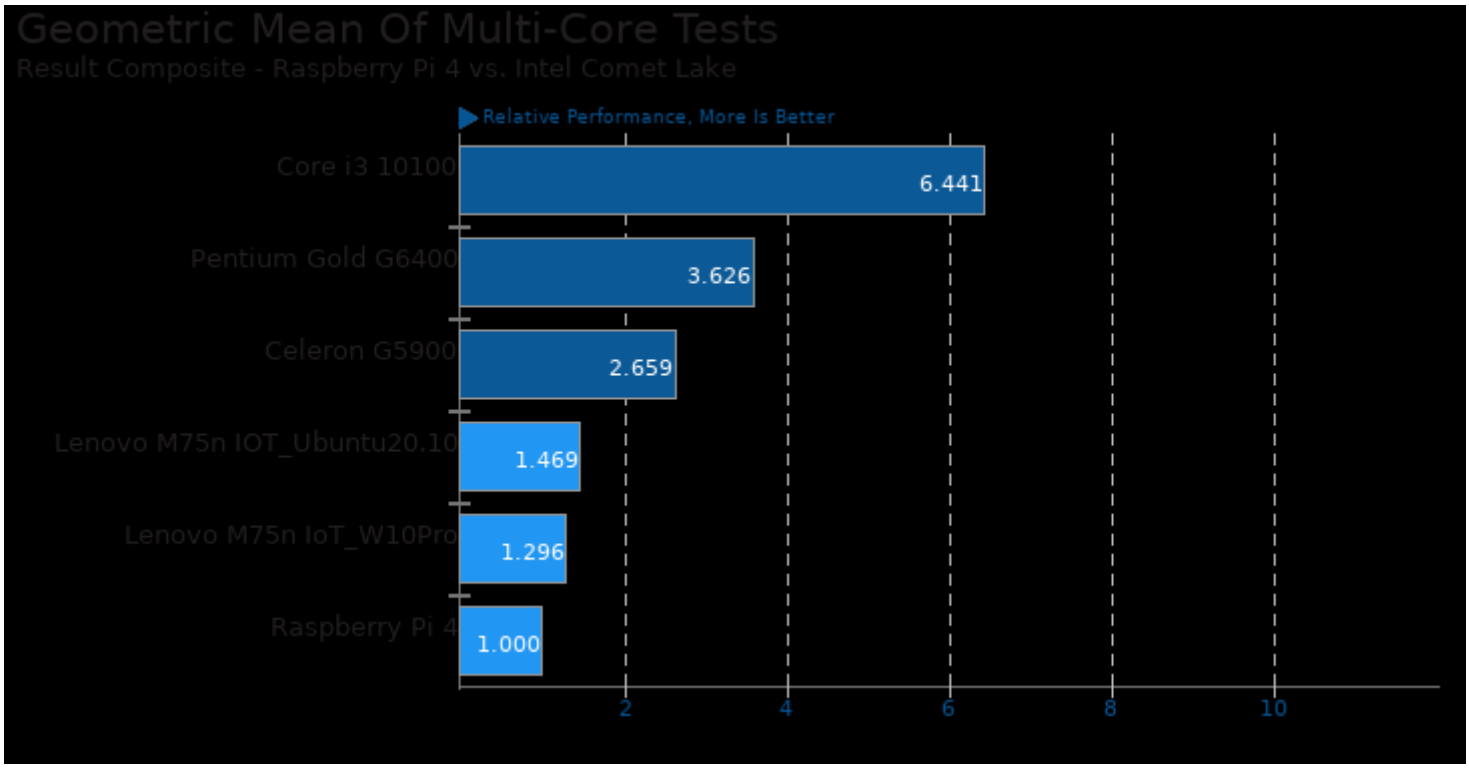
Geometric mean based upon tests: pts/c-ray, pts/aobench, pts/smallpt, pts/ttsiod-renderer, system/tesseract-ocr, system/ocrmypdf, pts/encode-mp3, pts/encode-flac, pts/graphics-magick, system/inkscape, system/rawtherapee, pts/tjbench, system/gimp, system/hugin, system/rsvg and system/gegl



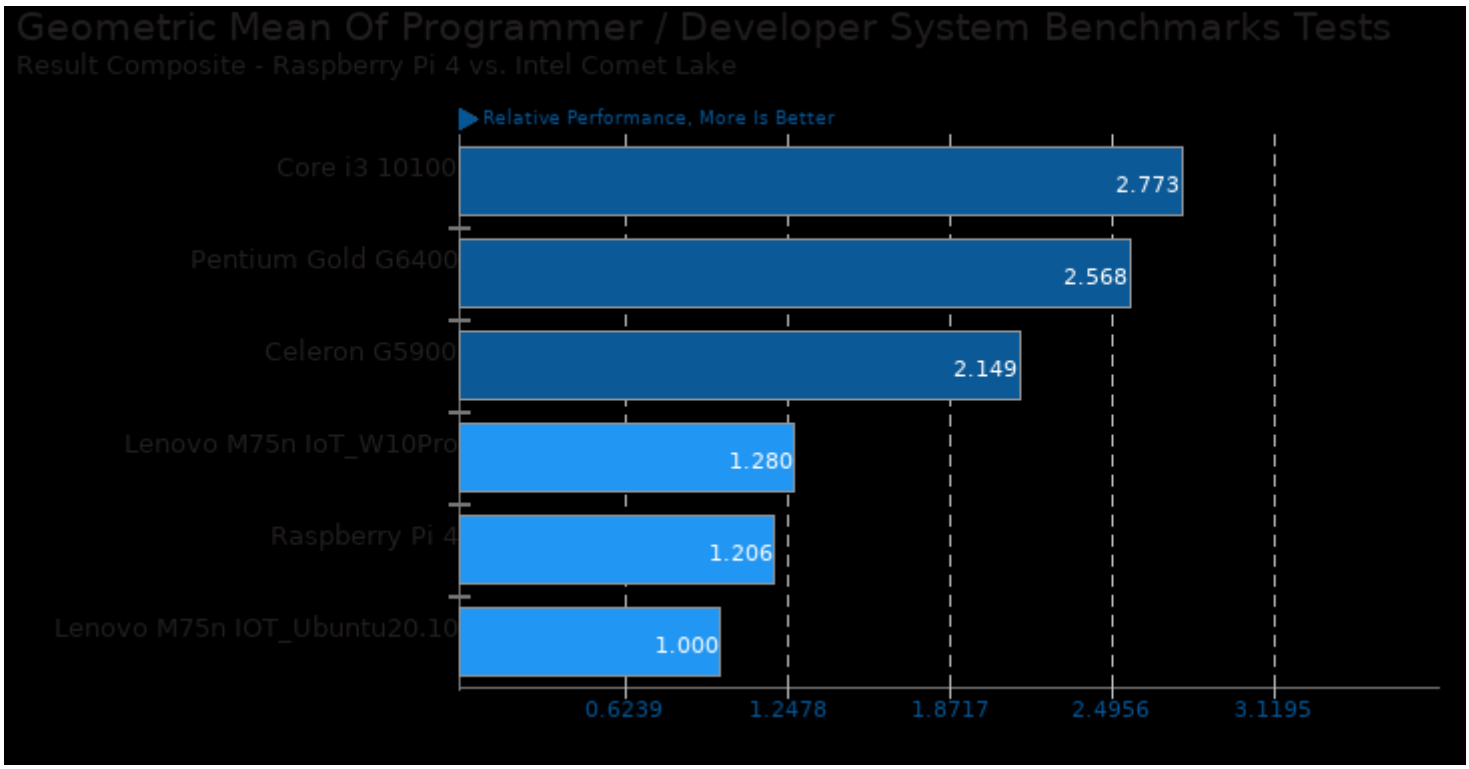
Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac



Geometric mean based upon tests: pts/graphics-magick, system/inkscape, system/rawtherapee, pts/tjbench, system/gimp, system/hugin, system/rsvg and system/gegl

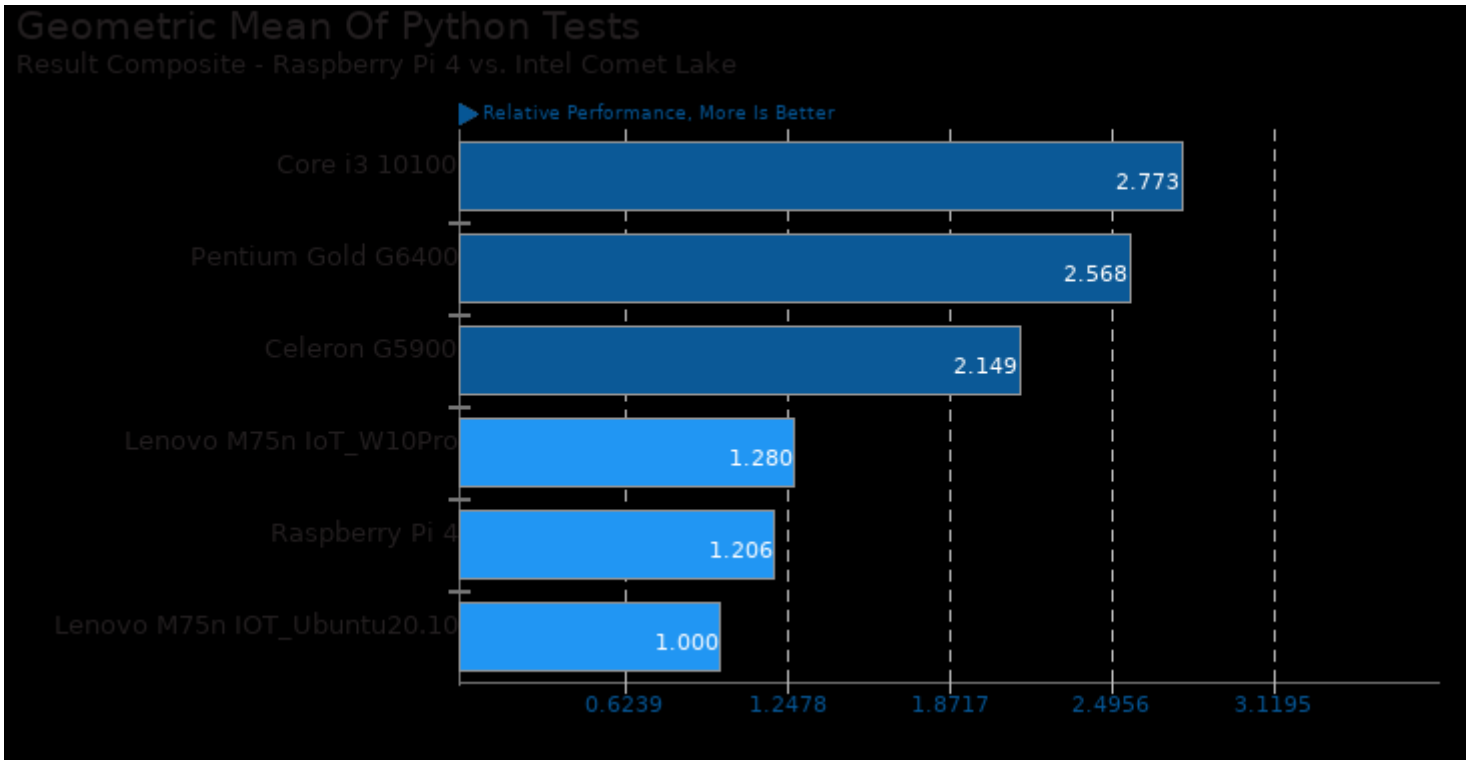


Geometric mean based upon tests: pts/c-ray, pts/coremark, pts/aircrack-ng, pts/smallpt, pts/graphics-magick, pts/lammps, pts/compress-7zip, pts/build-apache, pts/build-php, pts/build-gdb, pts/build-mplayer, pts/aobench and pts/ttsiod-renderer

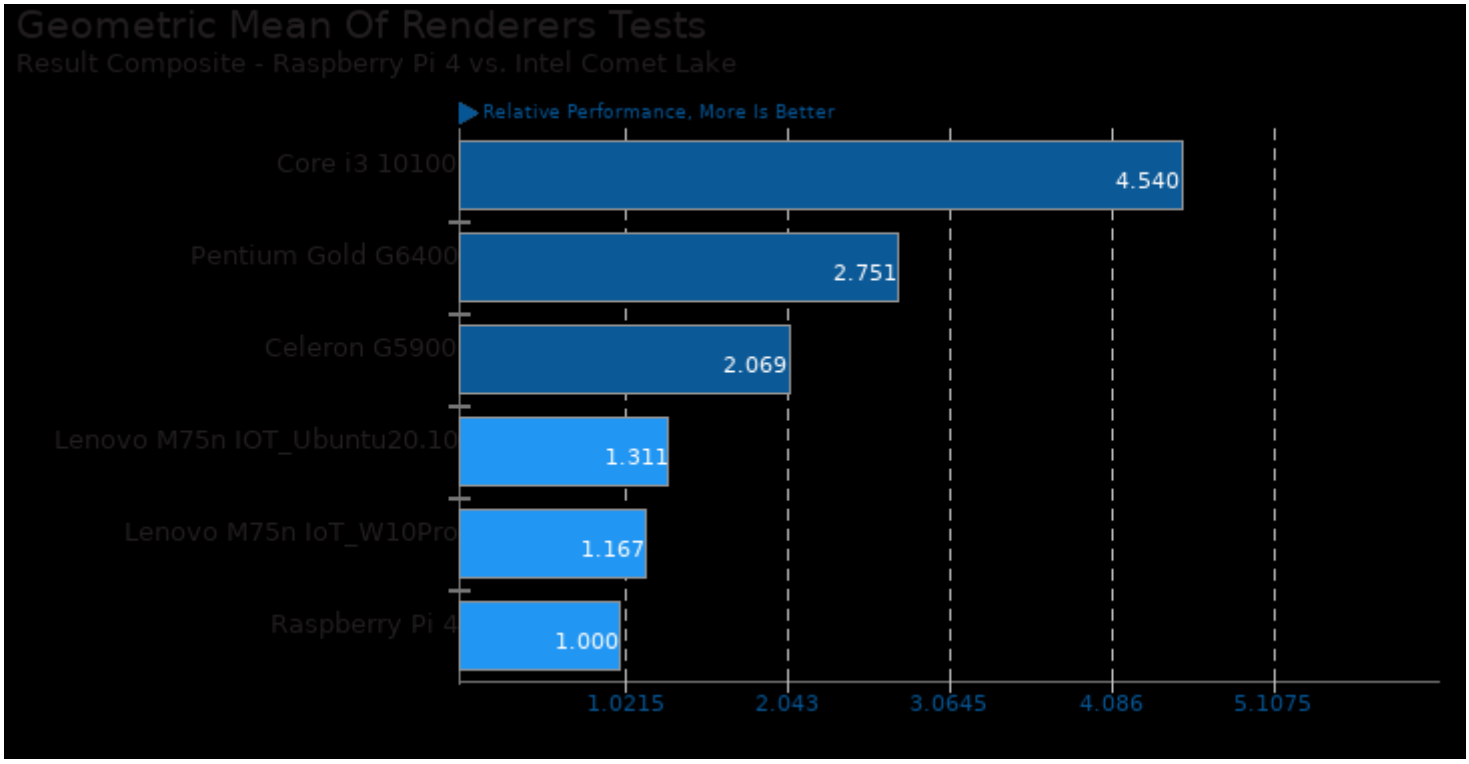


Geometric mean based upon tests: pts/sqlite-speedtest, pts/pyperformance, pts/pybench, pts/build-apache, pts/build-php, pts/build-gdb and pts/build-mplayer

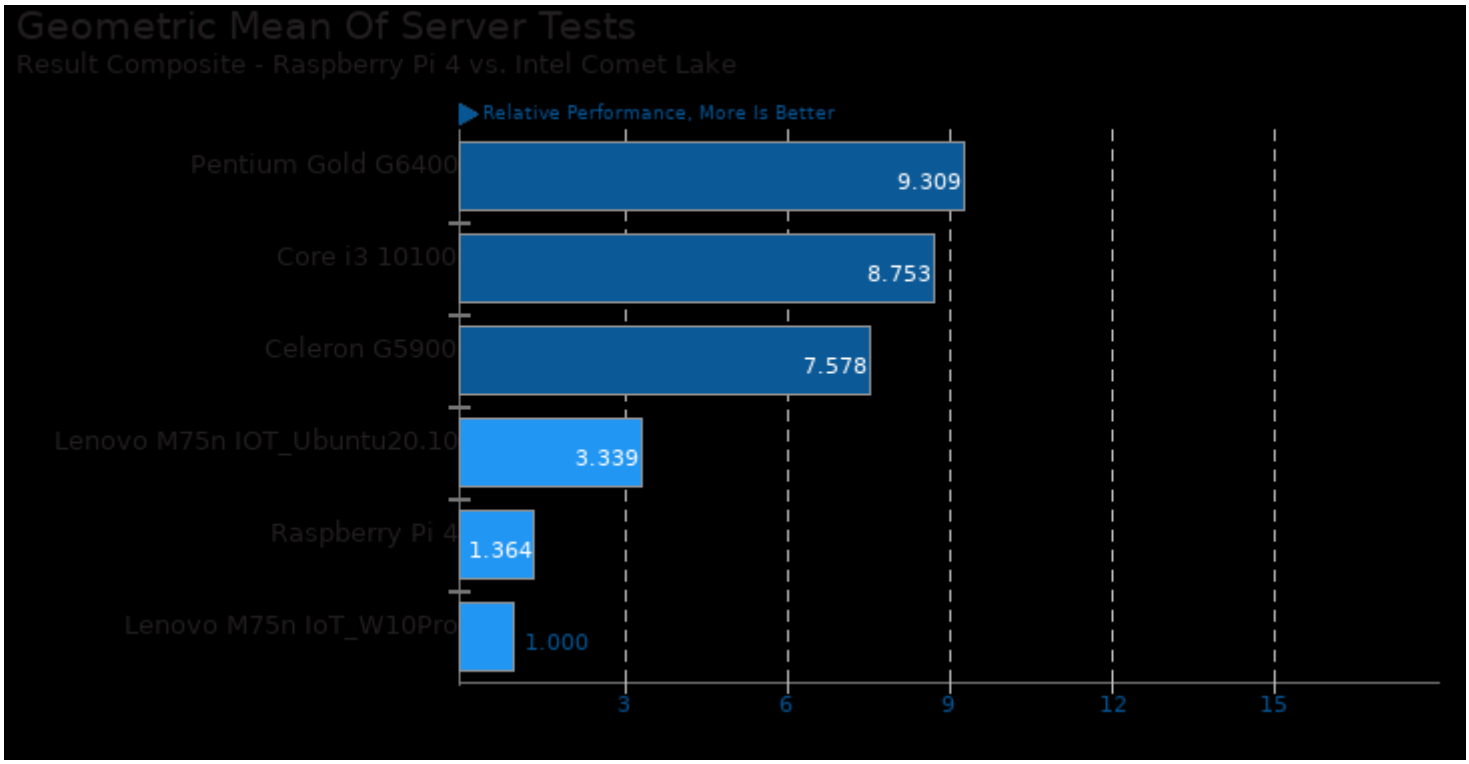
Raspberry Pi 4 vs. Intel Comet Lake



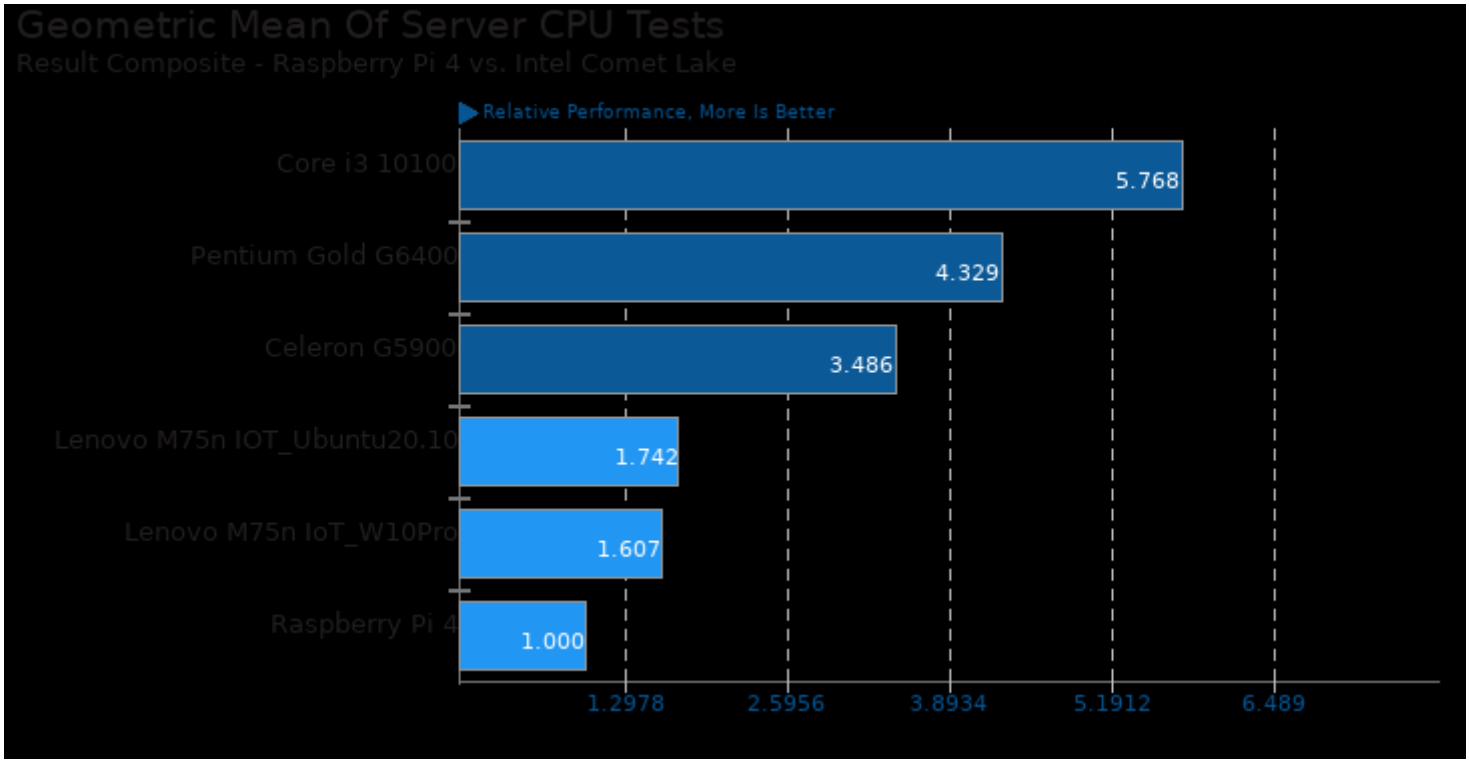
Geometric mean based upon tests: pts/pybench, pts/numpy, pts/scikit-learn and pts/pyperformance



Geometric mean based upon tests: pts/c-ray, pts/aobench, pts/smallpt and pts/ttsiod-renderer

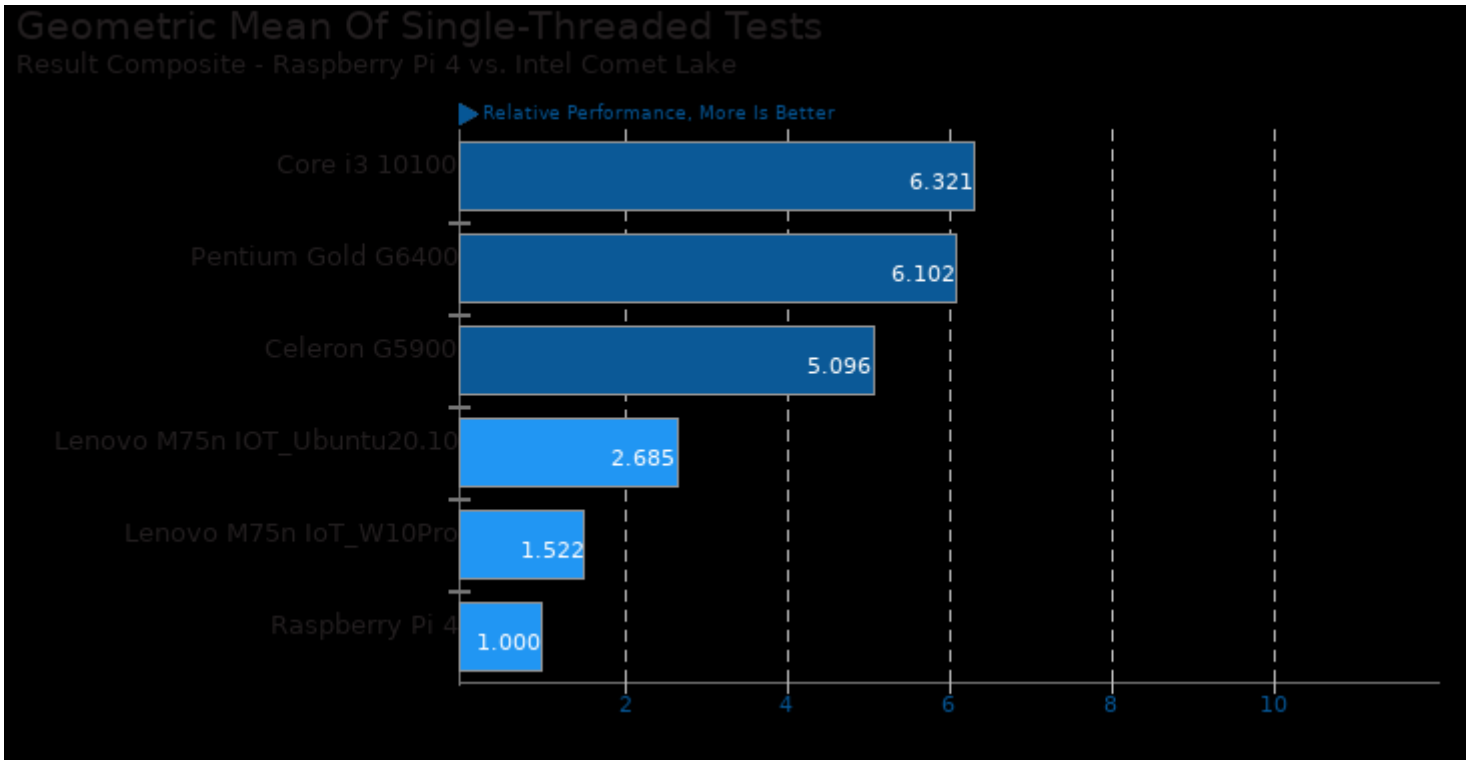


Geometric mean based upon tests: pts/phpbench, pts/openssl, pts/perl-benchmark and pts/sqlite-speedtest



Geometric mean based upon tests: pts/dacapobench, pts/compress-7zip, pts/build-php, pts/c-ray, pts/openssl, pts/tjbench, system/gimp, pts/pybench, pts/numpy, pts/phpbench, pts/scikit-learn and system/tesseract-ocr

Raspberry Pi 4 vs. Intel Comet Lake



Geometric mean based upon tests: pts/polybench-c, pts/numpy, pts/encode-flac, pts/encode-mp3, pts/perl-benchmark, pts/tjbench, system/inkscape, pts/pybench, pts/phpbench and system/tesseract-ocr

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 19:59.