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AMD Ryzen 9 5950X 16-Core testing with a ASUS ROG CROSSHAIR VIII HERO (WI-FI) (4006 BIOS) and llvmpipe on Ubuntu 22.04 via the Phoronix Test Suite.

Automated Executive Summary

C had the most wins, coming in first place for 33% of the tests.

Based on the geometric mean of all complete results, the fastest (A) was 1.004x the speed of the slowest (D). C was 1x the speed of A, B was 1x the speed of C, D was 0.996x the speed of B.

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

Apache Spark (Row Count: 1000000 - Partitions: 100 - Inner Join Test Time) at 1.166x
Apache Spark (Row Count: 1000000 - Partitions: 2000 - Broadcast Inner Join Test Time) at 1.138x
Apache Spark (Row Count: 1000000 - Partitions: 100 - Repartition Test Time) at 1.098x
Apache Spark (Row Count: 1000000 - Partitions: 1000 - SHA-512 Benchmark Time) at 1.097x
Apache Spark (Row Count: 1000000 - Partitions: 2000 - Inner Join Test Time) at 1.086x
Apache Spark (Row Count: 10000000 - Partitions: 2000 - Broadcast Inner Join Test Time) at 1.084x
Apache Spark (Row Count: 40000000 - Partitions: 1000 - Inner Join Test Time) at 1.079x
Apache Spark (Row Count: 20000000 - Partitions: 1000 - Broadcast Inner Join Test Time) at 1.077x
Apache Spark (Row Count: 10000000 - Partitions: 100 - Broadcast Inner Join Test Time) at 1.077x

Apache Spark (Row Count: 20000000 - Partitions: 2000 - Inner Join Test Time) at 1.07x.

Test Systems:

A

B

C

D

Processor: AMD Ryzen 9 5950X 16-Core @ 3.40GHz (16 Cores / 32 Threads), Motherboard: ASUS ROG CROSSHAIR VIII HERO (WI-FI) (4006 BIOS), Chipset: AMD Starship/Matisse, Memory: 32GB, Disk: 1000GB Sabrent Rocket 4.0 Plus, Graphics: llvmpipe, Audio: AMD Navi 21 HDMI Audio, Network: Realtek RTL8125 2.5GbE + Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 22.04, Kernel: 5.15.0-40-generic (x86_64), Desktop: GNOME Shell 42.2, Display Server: X Server 1.21.1.3, OpenGL: 4.5 Mesa 22.0.1 (LLVM 13.0.1 256 bits), Vulkan: 1.2.204, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 3840x2160

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --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-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-gBFGDP/gcc-11-11.2.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-11-gBFGDP/gcc-11-11.2.0/debian/tmp-gcn/usr --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-build-config=bootstrap-lto-lean --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 schedutil (Boost: Enabled) - CPU Microcode: 0xa201016
Java Notes: OpenJDK Runtime Environment (build 11.0.16+8-post-Ubuntu-0ubuntu122.04)
Python Notes: Python 3.10.4
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio_stale_data: 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 Retpolines IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	A	B	C	D
LAMMPS Molecular Dynamics Simulator - 20k Atoms (ns/day)	12.647	12.58	**12.69**	**12.563**
Normalized	99.66%	99.13%	100%	99%
Standard Deviation	0.6%			
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein	12.576	**12.357**	12.605	**12.736**
Normalized	98.74%	97.02%	98.97%	100%
Standard Deviation	2.3%			

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SVT-AV1 - Preset 4 - Bosphorus 4K (FPS)	**2.433**	**2.414**	2.428	2.42
Normalized	100%	99.22%	99.79%	99.47%
Standard Deviation	0.3%			
SVT-AV1 - Preset 8 - Bosphorus 4K (FPS)	**52.025**	51.538	**50.477**	51.017
Normalized	100%	99.06%	97.02%	98.06%
Standard Deviation	0.2%			
SVT-AV1 - Preset 10 - Bosphorus 4K (FPS)	**89.621**	88.175	88.079	**86.744**
Normalized	100%	98.39%	98.28%	96.79%
Standard Deviation	1.1%			
SVT-AV1 - Preset 12 - Bosphorus 4K (FPS)	**119.522**	117.609	112.778	**112.206**
Normalized	100%	98.4%	94.36%	93.88%
Standard Deviation	0.2%			
SVT-AV1 - Preset 4 - Bosphorus 1080p (FPS)	7.093	7.087	**7.206**	**7.061**
Normalized	98.43%	98.35%	100%	97.99%
Standard Deviation	1.5%			
SVT-AV1 - Preset 8 - Bosphorus 1080p (FPS)	142.242	**143.357**	**140.848**	141.942
Normalized	99.22%	100%	98.25%	99.01%
Standard Deviation	0.9%			
SVT-AV1 - Preset 10 - Bosphorus 1080p (FPS)	**305.709**	303.45	300.674	**298.746**
Normalized	100%	99.26%	98.35%	97.72%
Standard Deviation	0.5%			
SVT-AV1 - Preset 12 - Bosphorus 1080p (FPS)	**446.746**	443.173	441.567	**439.841**
Normalized	100%	99.2%	98.84%	98.45%
Standard Deviation	1.2%			
Primesieve - 1e12 (sec)	10.625	**10.568**	10.628	**10.652**
Normalized	99.46%	100%	99.44%	99.21%
Standard Deviation	0.2%			
Primesieve - 1e13 (sec)	**134.358**	**133.792**	134.048	134.26
Normalized	99.58%	100%	99.81%	99.65%
Standard Deviation	0.2%			
Aircrack-ng (k/s)	72757		**72788**	**72751**
Normalized	99.96%		100%	99.95%
Standard Deviation	0.3%			
Node.js V8 Web Tooling Benchmark (runs/s)	14.62	**14.74**	14.69	**14.55**
Normalized	99.19%	100%	99.66%	98.71%
Standard Deviation	0.7%			
Apache Spark - 1000000 - 100 - S.5.B.T (sec)	3.31	3.28	**3.41**	**3.25**
Normalized	98.19%	99.09%	95.31%	100%
Standard Deviation	1.3%			
Apache Spark - 1000000 - 100 - C.P.B (sec)	85.020832690	**85.094623072**	84.62	**84.48**
Normalized	99.36%	99.28%	99.83%	100%
Standard Deviation	0.5%			

Apache Spark - 1000000 - 100 - C.P.B.U.D (sec)	5.05	**5.09**	**5.01**	5.07
Normalized	99.21%	98.43%	100%	98.82%
Standard Deviation	0.4%			
Apache Spark - 1000000 - 100 - Group By Test Time (sec)	3.41	**3.40**	3.41	**3.60**
Normalized	99.71%	100%	99.71%	94.44%
Standard Deviation	0.9%			
Apache Spark - 1000000 - 100 - R.T.T (sec)	1.90	1.89	**1.74**	**1.91**
Normalized	91.58%	92.06%	100%	91.1%
Standard Deviation	0.1%			
Apache Spark - 1000000 - 100 - I.J.T.T (sec)	**1.69**	1.56	**1.45**	1.67
Normalized	85.8%	92.95%	100%	86.83%
Standard Deviation	2.4%			
Apache Spark - 1000000 - 100 - B.I.J.T.T (sec)	1.50	**1.60**	**1.47**	1.50
Normalized	98%	91.88%	100%	98%
Standard Deviation	13%			
Apache Spark - 1000000 - 500 - S.5.B.T (sec)	3.32	3.31	**3.45**	**3.26**
Normalized	98.19%	98.49%	94.49%	100%
Standard Deviation	0.6%			
Apache Spark - 1000000 - 500 - C.P.B (sec)	**85.14**	86.60	85.83	**87.33**
Normalized	100%	98.31%	99.2%	97.49%
Standard Deviation	0.5%			
Apache Spark - 1000000 - 500 - C.P.B.U.D (sec)	5.06	**5.11**	**5.02**	5.09
Normalized	99.21%	98.24%	100%	98.62%
Standard Deviation	1.7%			
Apache Spark - 1000000 - 500 - Group By Test Time (sec)	**3.40**	**3.40**	3.38	**3.23**
Normalized	95%	95%	95.56%	100%
Standard Deviation	0.9%			
Apache Spark - 1000000 - 500 - R.T.T (sec)	1.90	**1.87**	**1.91**	**1.87**
Normalized	98.42%	100%	97.91%	100%
Standard Deviation	1.3%			
Apache Spark - 1000000 - 500 - I.J.T.T (sec)	**1.73**	**1.73**	1.732037627	**1.83**
Normalized	100%	100%	99.88%	94.54%
Standard Deviation	5.6%			
Apache Spark - 1000000 - 500 - B.I.J.T.T (sec)	1.43	**1.48**	**1.41**	**1.41**
Normalized	98.6%	95.27%	100%	100%
Standard Deviation	5.3%			
Apache Spark - 1000000 - 1000 - S.5.B.T (sec)	3.50	**3.31**	**3.63**	3.50
Normalized	94.57%	100%	91.18%	94.57%
Standard Deviation	0.4%			

Apache Spark - 1000000 - 1000 - C.P.B (sec)	85.61	**86.36**	**84.740388275**	85.28
Normalized	98.98%	98.12%	100%	99.37%
Standard Deviation	1.6%			
Apache Spark - 1000000 - 1000 - C.P.B.U.D (sec)	5.06	**5.01**	**5.11**	5.10
Normalized	99.01%	100%	98.04%	98.24%
Standard Deviation	1.3%			
Apache Spark - 1000000 - 1000 - Group By Test Time (sec)	**3.37**	3.46	**3.472859857**	3.38
Normalized	100%	97.4%	97.04%	99.7%
Standard Deviation	0.9%			
Apache Spark - 1000000 - 1000 - R.T.T (sec)	2.00	2.02	**1.99**	**2.03**
Normalized	99.5%	98.51%	100%	98.03%
Standard Deviation	1.5%			
Apache Spark - 1000000 - 1000 - I.J.T.T (sec)	**1.91**	**1.79**	1.88	1.88
Normalized	93.72%	100%	95.21%	95.21%
Standard Deviation	3.6%			
Apache Spark - 1000000 - 1000 - B.I.J.T.T (sec)	**1.68**	**1.66**	1.67	1.67
Normalized	98.81%	100%	99.4%	99.4%
Standard Deviation	5.3%			
Apache Spark - 1000000 - 2000 - S.5.B.T (sec)	**3.70**	3.77	3.73	**3.86**
Normalized	100%	98.14%	99.2%	95.85%
Standard Deviation	2.4%			
Apache Spark - 1000000 - 2000 - C.P.B (sec)	85.35	**85.510915166**	85.26	**85.20**
Normalized	99.82%	99.64%	99.93%	100%
Standard Deviation	0.7%			
Apache Spark - 1000000 - 2000 - C.P.B.U.D (sec)	**5.03**	**5.03**	**5.04**	**5.03**
Normalized	100%	100%	99.8%	100%
Standard Deviation	0.7%			
Apache Spark - 1000000 - 2000 - Group By Test Time (sec)	**3.86**	3.90	**3.95**	3.90
Normalized	100%	98.97%	97.72%	98.97%
Standard Deviation	1.8%			
Apache Spark - 1000000 - 2000 - R.T.T (sec)	2.46	2.42	**2.40**	**2.55**
Normalized	97.56%	99.17%	100%	94.12%
Standard Deviation	2.3%			
Apache Spark - 1000000 - 2000 - I.J.T.T (sec)	2.49	2.44	**2.53**	**2.33**
Normalized	93.57%	95.49%	92.09%	100%
Standard Deviation	2.7%			
Apache Spark - 1000000 - 2000 - B.I.J.T.T (sec)	1.98	2.12	**1.96**	**2.23**
Normalized	98.99%	92.45%	100%	87.89%
Standard Deviation	5.3%			

Apache Spark - 10000000 - 100 - S.5.B.T (sec)	**16.207961663**	16.19	16.19	**16.09**
Normalized	99.27%	99.38%	99.38%	100%
Standard Deviation	0.1%			
Apache Spark - 10000000 - 100 - C.P.B (sec)	85.57	**84.922710339**	**85.95**	85.49
Normalized	99.24%	100%	98.8%	99.34%
Standard Deviation	0.5%			
Apache Spark - 10000000 - 100 - C.P.B.U.D (sec)	**5.07**	5.06	**5.01**	5.03
Normalized	98.82%	99.01%	100%	99.6%
Standard Deviation	0.5%			
Apache Spark - 10000000 - 100 - Group By Test Time (sec)	6.84	6.78	**6.70**	**6.92**
Normalized	97.95%	98.82%	100%	96.82%
Standard Deviation	1.3%			
Apache Spark - 10000000 - 100 - R.T.T (sec)	10.225342330	10.45	**10.59**	**10.21**
Normalized	99.85%	97.7%	96.41%	100%
Standard Deviation	0.7%			
Apache Spark - 10000000 - 100 - I.J.T.T (sec)	11.895787558	**11.70**	11.98	**12.190615157**
Normalized	98.35%	100%	97.66%	95.98%
Standard Deviation	3.5%			
Apache Spark - 10000000 - 100 - B.I.J.T.T (sec)	11.770975614	**11.14**	**12.00**	11.20
Normalized	94.64%	100%	92.83%	99.46%
Standard Deviation	1.3%			
Apache Spark - 10000000 - 500 - S.5.B.T (sec)	15.86	**16.60**	15.94	**15.68**
Normalized	98.87%	94.46%	98.37%	100%
Standard Deviation	0.7%			
Apache Spark - 10000000 - 500 - C.P.B (sec)	85.61	**86.11**	85.93	**84.90**
Normalized	99.17%	98.59%	98.8%	100%
Standard Deviation	0.7%			
Apache Spark - 10000000 - 500 - C.P.B.U.D (sec)	**5.05**	**5.09**	**5.05**	5.06
Normalized	100%	99.21%	100%	99.8%
Standard Deviation	0.5%			
Apache Spark - 10000000 - 500 - Group By Test Time (sec)	6.40	**6.39**	**6.51**	6.50
Normalized	99.84%	100%	98.16%	98.31%
Standard Deviation	0.5%			
Apache Spark - 10000000 - 500 - R.T.T (sec)	10.01	**9.92**	**10.22**	10.02
Normalized	99.1%	100%	97.06%	99%
Standard Deviation	1.8%			
Apache Spark - 10000000 - 500 - I.J.T.T (sec)	11.287056352	**11.220928559**	11.45	**11.72**
Normalized	99.41%	100%	98%	95.74%
Standard Deviation	1.2%			

Apache Spark - 10000000 - 500 - B.I.J.T.T (sec)	**10.73**	10.99	**11.34**	11.17
Normalized	100%	97.63%	94.62%	96.06%
Standard Deviation	2.7%			
Apache Spark - 20000000 - 100 - S.5.B.T (sec)	30.56	30.42	**31.69**	**30.349860224**
Normalized	99.31%	99.77%	95.77%	100%
Standard Deviation	1.5%			
Apache Spark - 20000000 - 100 - C.P.B (sec)	**85.18**	85.55	**85.80114946**	85.75
Normalized	100%	99.57%	99.28%	99.34%
Standard Deviation	0.1%			
Apache Spark - 20000000 - 100 - C.P.B.U.D (sec)	5.06	**5.07**	**5.00**	**5.07**
Normalized	98.81%	98.62%	100%	98.62%
Standard Deviation	0.4%			
Apache Spark - 20000000 - 100 - Group By Test Time (sec)	10.50	10.19	**10.13**	**10.56**
Normalized	96.48%	99.41%	100%	95.93%
Standard Deviation	1.8%			
Apache Spark - 20000000 - 100 - R.T.T (sec)	**20.61**	20.77	**20.87**	20.72
Normalized	100%	99.23%	98.75%	99.47%
Standard Deviation	0.4%			
Apache Spark - 20000000 - 100 - I.J.T.T (sec)	23.408429797	23.79	**24.11**	**23.04**
Normalized	98.43%	96.85%	95.56%	100%
Standard Deviation	3.2%			
Apache Spark - 20000000 - 100 - B.I.J.T.T (sec)	**22.503354842**	**23.60**	22.88	23.00
Normalized	100%	95.35%	98.35%	97.84%
Standard Deviation	1%			
Apache Spark - 20000000 - 500 - S.5.B.T (sec)	29.76	29.75	**29.79**	**29.47**
Normalized	99.03%	99.06%	98.93%	100%
Standard Deviation	0.4%			
Apache Spark - 20000000 - 500 - C.P.B (sec)	85.63	**84.91**	**87.04**	85.91
Normalized	99.16%	100%	97.55%	98.84%
Standard Deviation	0.3%			
Apache Spark - 20000000 - 500 - C.P.B.U.D (sec)	**5.06**	**5.10**	**5.06**	5.08
Normalized	100%	99.22%	100%	99.61%
Standard Deviation	0.2%			
Apache Spark - 20000000 - 500 - Group By Test Time (sec)	9.71	**9.83**	9.75	**9.67**
Normalized	99.59%	98.37%	99.18%	100%
Standard Deviation	1.4%			
Apache Spark - 20000000 - 500 - R.T.T (sec)	20.00	19.75	**19.44**	**20.18**
Normalized	97.2%	98.43%	100%	96.33%
Standard Deviation	0.3%			

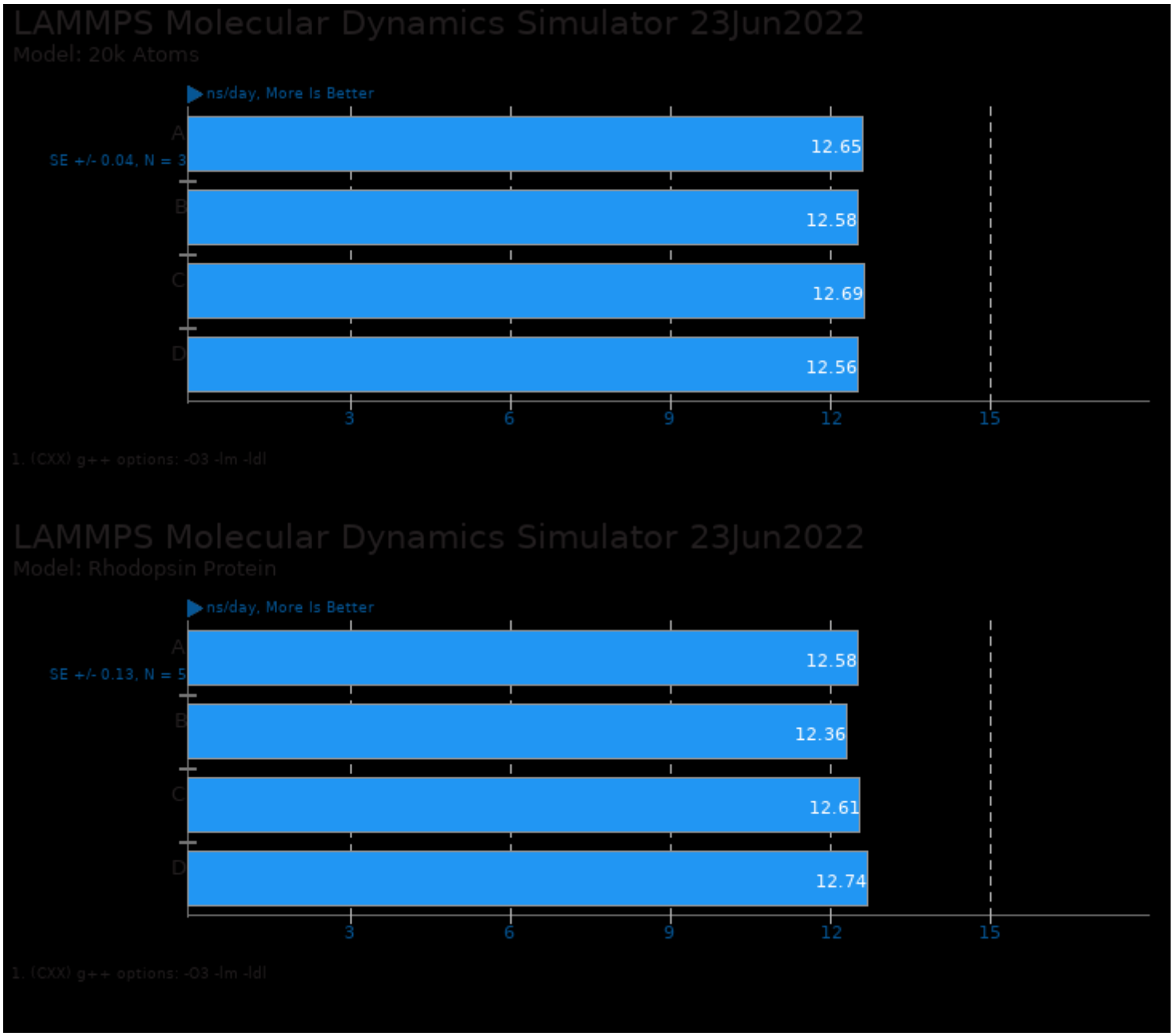
Apache Spark - 20000000 - 500 - I.J.T.T (sec)	22.57	22.14	21.40	22.29
Normalized	94.82%	96.66%	100%	96.01%
Standard Deviation	1.1%			
Apache Spark - 20000000 - 500 - B.I.J.T.T (sec)	21.69	21.68	21.22	21.665859572
Normalized	97.83%	97.88%	100%	97.94%
Standard Deviation	1.6%			
Apache Spark - 40000000 - 100 - S.5.B.T (sec)	60.77	61.57	59.39	59.424458504
Normalized	97.73%	96.46%	100%	99.94%
Standard Deviation	2.2%			
Apache Spark - 40000000 - 100 - C.P.B (sec)	86.18	85.779159799	85.10	85.36
Normalized	98.75%	99.21%	100%	99.7%
Standard Deviation	2%			
Apache Spark - 40000000 - 100 - C.P.B.U.D (sec)	5.05	5.10	5.02	5.08
Normalized	99.41%	98.43%	100%	98.82%
Standard Deviation	1.1%			
Apache Spark - 40000000 - 100 - Group By Test Time (sec)	30.24	30.285293939	30.38	30.77
Normalized	100%	99.85%	99.54%	98.28%
Standard Deviation	0.7%			
Apache Spark - 40000000 - 100 - R.T.T (sec)	41.09	40.893068701	40.57	40.93
Normalized	98.73%	99.21%	100%	99.12%
Standard Deviation	0.5%			
Apache Spark - 40000000 - 100 - I.J.T.T (sec)	45.17	45.995650851	44.64	45.77
Normalized	98.83%	97.05%	100%	97.53%
Standard Deviation	0.8%			
Apache Spark - 40000000 - 100 - B.I.J.T.T (sec)	44.444641786	44.53	45.16	45.68
Normalized	100%	99.81%	98.42%	97.3%
Standard Deviation	0.9%			
Apache Spark - 40000000 - 500 - S.5.B.T (sec)	58.20	56.46	56.37	59.74
Normalized	96.86%	99.84%	100%	94.36%
Standard Deviation	2.9%			
Apache Spark - 40000000 - 500 - C.P.B (sec)	85.56	85.76	85.05	85.39
Normalized	99.4%	99.17%	100%	99.6%
Standard Deviation	0.5%			
Apache Spark - 40000000 - 500 - C.P.B.U.D (sec)	5.06	5.10	5.11	4.99
Normalized	98.62%	97.84%	97.65%	100%
Standard Deviation	0.9%			
Apache Spark - 40000000 - 500 - Group By Test Time (sec)	28.57	28.64	28.51	28.71
Normalized	99.79%	99.55%	100%	99.3%
Standard Deviation	0.5%			

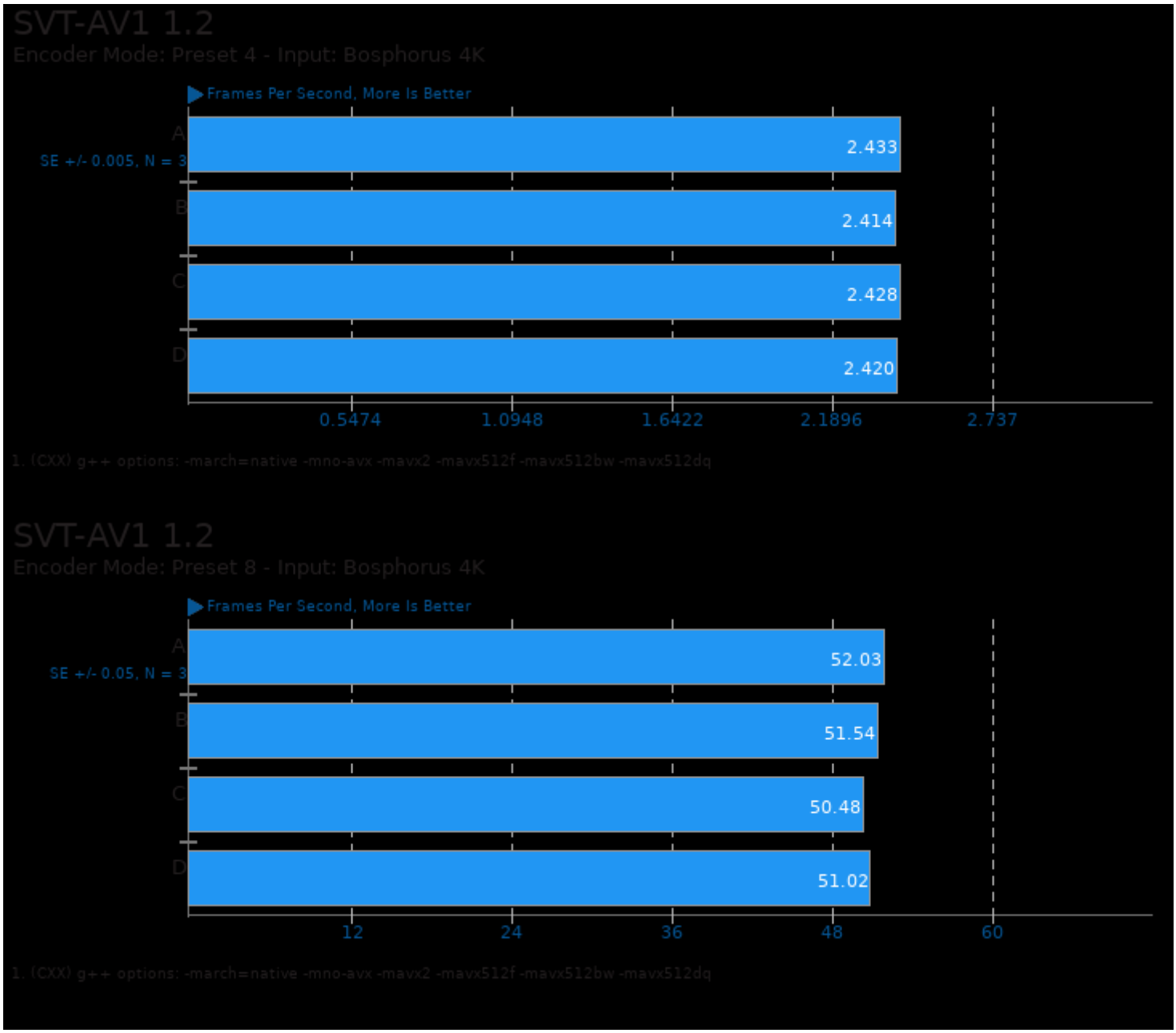
Apache Spark - 40000000 - 500 - R.T.T (sec)	39.84	39.71	**40.07**	**39.65**
Normalized	99.52%	99.85%	98.95%	100%
Standard Deviation	1.3%			
Apache Spark - 40000000 - 500 - I.J.T.T (sec)	43.66	**43.45**	**44.39**	43.96
Normalized	99.52%	100%	97.88%	98.84%
Standard Deviation	1.5%			
Apache Spark - 40000000 - 500 - B.I.J.T.T (sec)	43.30	43.58	**43.61**	**42.28**
Normalized	97.64%	97.02%	96.95%	100%
Standard Deviation	0.8%			
Apache Spark - 10000000 - 1000 - S.5.B.T (sec)	**15.90**	16.17	**16.91**	15.96
Normalized	100%	98.33%	94.03%	99.62%
Standard Deviation	0.3%			
Apache Spark - 10000000 - 1000 - C.P.B (sec)	85.91	86.03	**86.15**	**84.896864782**
Normalized	98.82%	98.68%	98.55%	100%
Standard Deviation	0.8%			
Apache Spark - 10000000 - 1000 - C.P.B.U.D (sec)	5.05	**5.09**	**5.02**	**5.09**
Normalized	99.41%	98.62%	100%	98.62%
Standard Deviation	0.2%			
Apache Spark - 10000000 - 1000 - Group By Test Time (sec)	6.86	6.75	**6.60**	**6.93**
Normalized	96.21%	97.78%	100%	95.24%
Standard Deviation	0.9%			
Apache Spark - 10000000 - 1000 - R.T.T (sec)	10.28	10.14	**10.05**	**10.310181768**
Normalized	97.76%	99.11%	100%	97.48%
Standard Deviation	1.3%			
Apache Spark - 10000000 - 1000 - I.J.T.T (sec)	11.37	**11.14**	11.26	**11.89**
Normalized	97.98%	100%	98.93%	93.69%
Standard Deviation	4.5%			
Apache Spark - 10000000 - 1000 - B.I.J.T.T (sec)	**10.99**	11.154432133	**11.16**	11.12
Normalized	100%	98.53%	98.48%	98.83%
Standard Deviation	0.6%			
Apache Spark - 10000000 - 2000 - S.5.B.T (sec)	16.34	**16.24**	**16.51**	16.25
Normalized	99.39%	100%	98.36%	99.94%
Standard Deviation	0.6%			
Apache Spark - 10000000 - 2000 - C.P.B (sec)	**85.20**	85.78	85.30	**85.99377701**
Normalized	100%	99.32%	99.88%	99.08%
Standard Deviation	0.5%			
Apache Spark - 10000000 - 2000 - C.P.B.U.D (sec)	5.03	**5.05**	**5.02**	5.03
Normalized	99.8%	99.41%	100%	99.8%
Standard Deviation	0.6%			

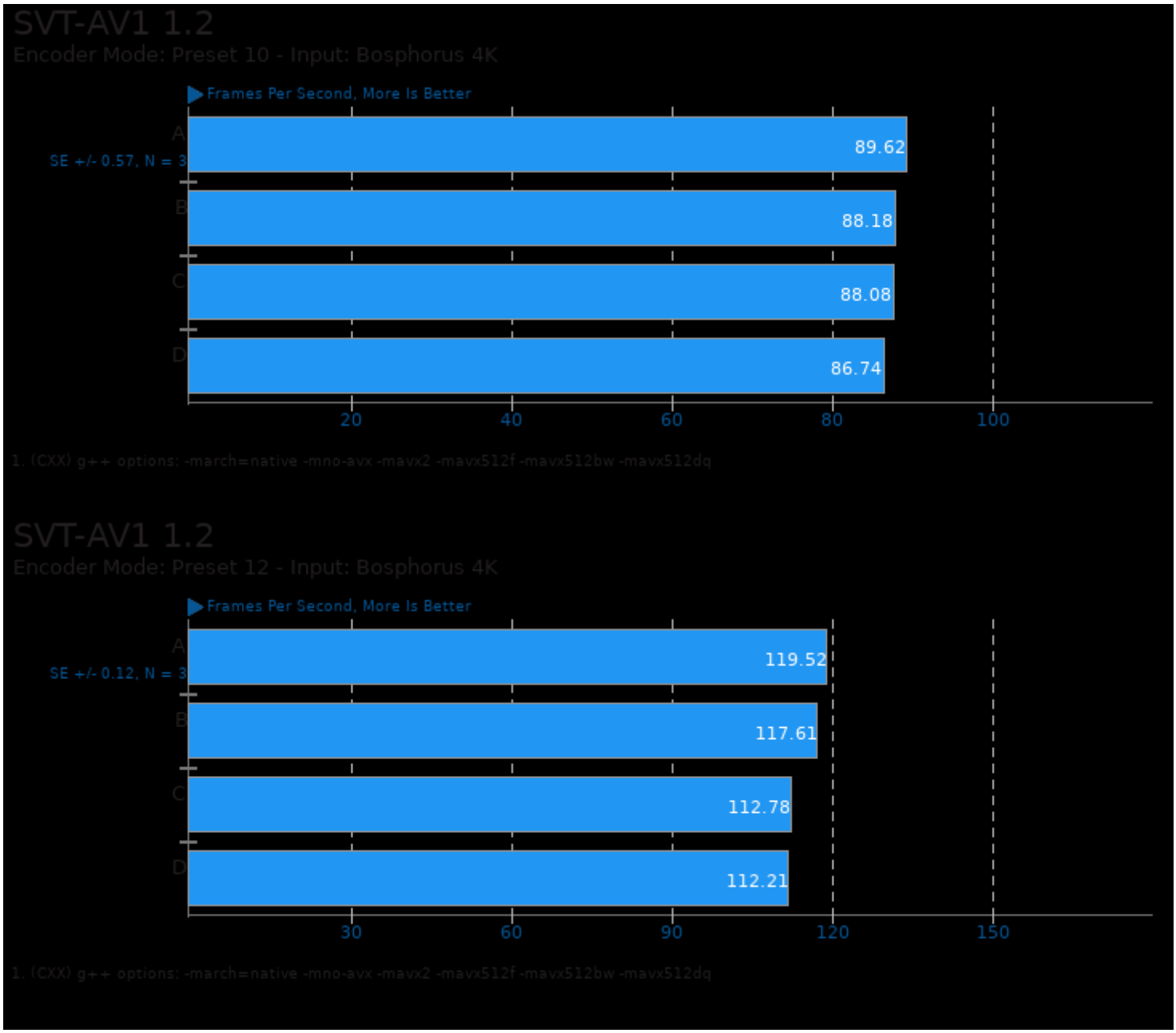
Apache Spark - 10000000 - 2000 - Group By Test Time (sec)	7.29	**7.06**	7.27	**7.38**
Normalized	96.84%	100%	97.11%	95.66%
Standard Deviation	2%			
Apache Spark - 10000000 - 2000 - R.T.T (sec)	10.48	10.476039948	**10.35**	**10.72**
Normalized	98.76%	98.8%	100%	96.55%
Standard Deviation	1.3%			
Apache Spark - 10000000 - 2000 - I.J.T.T (sec)	11.89	12.19	**11.73**	**12.28**
Normalized	98.65%	96.23%	100%	95.52%
Standard Deviation	0.6%			
Apache Spark - 10000000 - 2000 - B.I.J.T.T (sec)	11.12	**11.90**	**10.98**	11.36
Normalized	98.74%	92.27%	100%	96.65%
Standard Deviation	0.5%			
Apache Spark - 20000000 - 1000 - S.5.B.T (sec)	29.77	**30.53**	29.37	**29.34**
Normalized	98.56%	96.1%	99.9%	100%
Standard Deviation	2.5%			
Apache Spark - 20000000 - 1000 - C.P.B (sec)	85.50	85.44	**84.98**	**85.85**
Normalized	99.39%	99.46%	100%	98.99%
Standard Deviation	0.6%			
Apache Spark - 20000000 - 1000 - C.P.B.U.D (sec)	**5.05**	**5.25**	**5.05**	5.06
Normalized	100%	96.19%	100%	99.8%
Standard Deviation	1%			
Apache Spark - 20000000 - 1000 - Group By Test Time (sec)	10.16	**10.00**	**10.27**	10.03
Normalized	98.43%	100%	97.37%	99.7%
Standard Deviation	1.4%			
Apache Spark - 20000000 - 1000 - R.T.T (sec)	19.54	**19.66**	**19.45**	19.53
Normalized	99.54%	98.93%	100%	99.59%
Standard Deviation	0.7%			
Apache Spark - 20000000 - 1000 - I.J.T.T (sec)	21.77	**21.10**	**21.10**	**22.27**
Normalized	96.92%	100%	100%	94.75%
Standard Deviation	2%			
Apache Spark - 20000000 - 1000 - B.I.J.T.T (sec)	21.32	**20.43**	20.80	**22.01**
Normalized	95.83%	100%	98.22%	92.82%
Standard Deviation	1.8%			
Apache Spark - 20000000 - 2000 - S.5.B.T (sec)	**30.41**	**31.20**	**30.41**	31.17
Normalized	100%	97.47%	100%	97.56%
Standard Deviation	2.7%			
Apache Spark - 20000000 - 2000 - C.P.B (sec)	**85.77**	85.66	85.24	**85.20**
Normalized	99.34%	99.46%	99.95%	100%
Standard Deviation	0.8%			

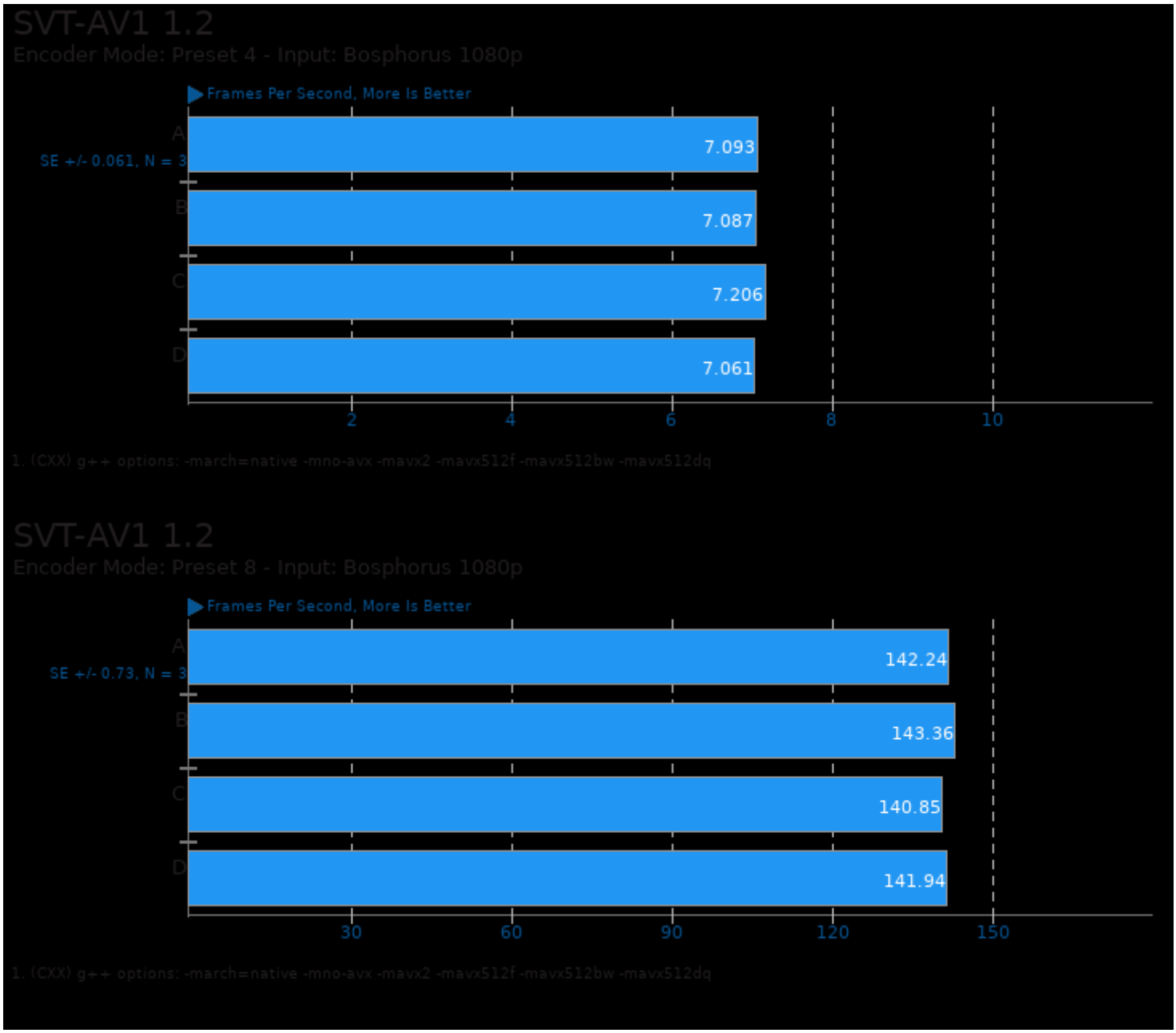
Apache Spark - 20000000 - 2000 - C.P.B.U.D (sec)	5.07	5.07	**5.03**	**5.12**
Normalized	99.21%	99.21%	100%	98.24%
Standard Deviation	1.2%			
Apache Spark - 20000000 - 2000 - Group By Test Time (sec)	10.32	10.25	**10.47**	**10.06**
Normalized	97.48%	98.15%	96.08%	100%
Standard Deviation	1.4%			
Apache Spark - 20000000 - 2000 - R.T.T (sec)	20.14	**19.87**	**20.93**	20.75
Normalized	98.66%	100%	94.94%	95.76%
Standard Deviation	1.4%			
Apache Spark - 20000000 - 2000 - I.J.T.T (sec)	22.80	**22.01**	**23.56**	23.28
Normalized	96.54%	100%	93.42%	94.54%
Standard Deviation	2.3%			
Apache Spark - 20000000 - 2000 - B.I.J.T.T (sec)	21.88	22.12	**22.81**	**21.67**
Normalized	99.04%	97.97%	95%	100%
Standard Deviation	2.5%			
Apache Spark - 40000000 - 1000 - S.5.B.T (sec)	**58.38**	57.04	**56.393666853**	56.97
Normalized	96.6%	98.87%	100%	98.99%
Standard Deviation	2.5%			
Apache Spark - 40000000 - 1000 - C.P.B (sec)	85.50	**86.314829773**	85.76	**85.36**
Normalized	99.84%	98.89%	99.53%	100%
Standard Deviation	0.5%			
Apache Spark - 40000000 - 1000 - C.P.B.U.D (sec)	**5.06**	5.05	5.04	**5.00**
Normalized	98.81%	99.01%	99.21%	100%
Standard Deviation	0.8%			
Apache Spark - 40000000 - 1000 - Group By Test Time (sec)	26.79	**27.013806994**	**26.70**	26.81
Normalized	99.66%	98.84%	100%	99.59%
Standard Deviation	0.8%			
Apache Spark - 40000000 - 1000 - R.T.T (sec)	**38.82**	38.229998126	38.19	**38.16**
Normalized	98.3%	99.82%	99.92%	100%
Standard Deviation	1.1%			
Apache Spark - 40000000 - 1000 - I.J.T.T (sec)	43.73	**42.53**	**45.90**	44.44
Normalized	97.26%	100%	92.66%	95.7%
Standard Deviation	2.6%			
Apache Spark - 40000000 - 1000 - B.I.J.T.T (sec)	42.82	**42.52**	**43.38**	42.85
Normalized	99.3%	100%	98.02%	99.23%
Standard Deviation	1.1%			
Apache Spark - 40000000 - 2000 - S.5.B.T (sec)	**60.61**	59.11	**57.65**	58.06
Normalized	95.12%	97.53%	100%	99.29%
Standard Deviation	1.1%			

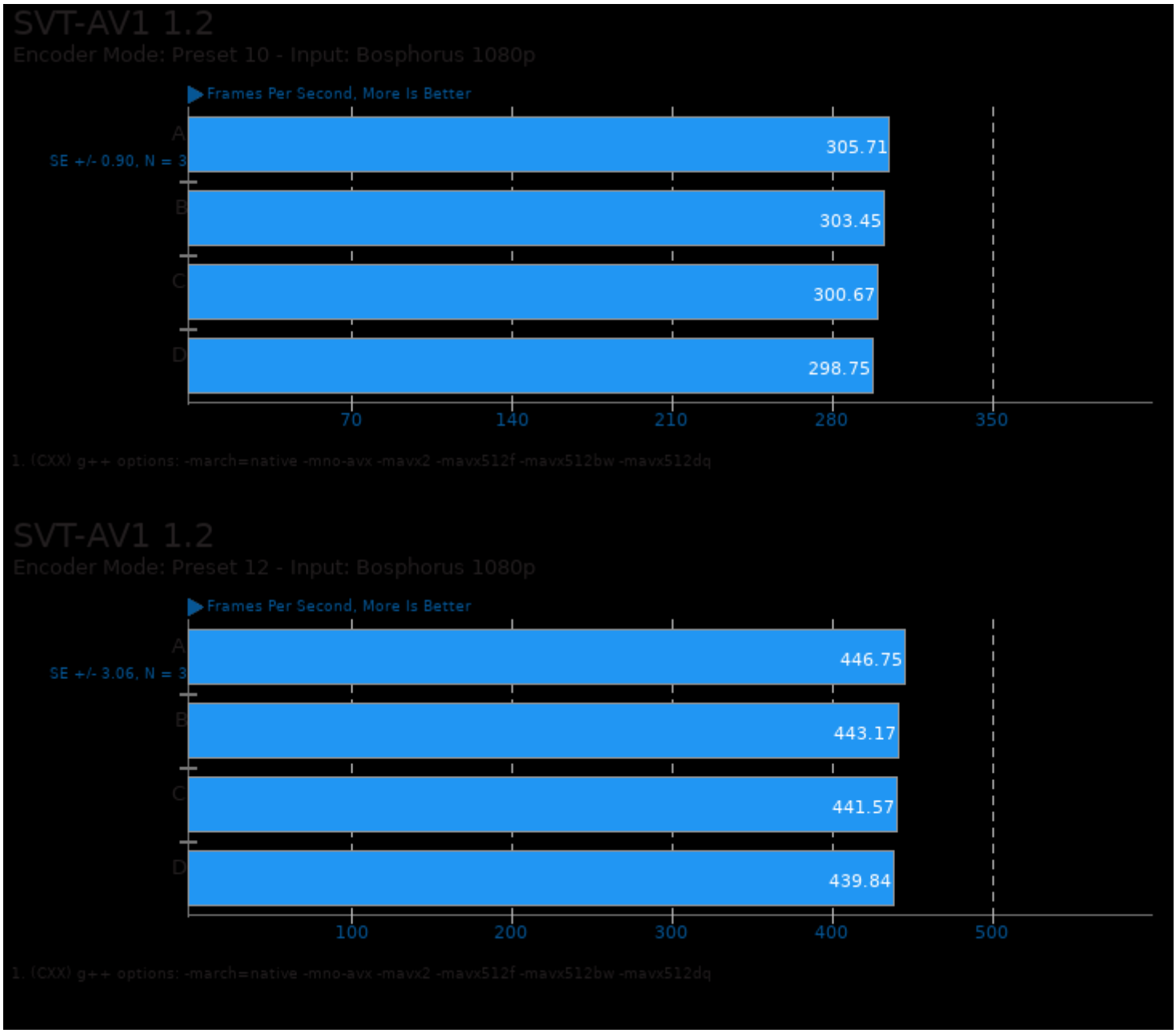
Apache Spark - 40000000 - 2000 - C.P.B (sec)	85.08	85.77	**86.41**	**84.89**
Normalized	99.78%	98.97%	98.24%	100%
Standard Deviation	0.3%			
Apache Spark - 40000000 - 2000 - C.P.B.U.D (sec)	5.06	**5.01**	**5.09**	5.04
Normalized	99.01%	100%	98.43%	99.4%
Standard Deviation	1%			
Apache Spark - 40000000 - 2000 - Group By Test Time (sec)	22.85	22.77	**22.55**	**23.14**
Normalized	98.69%	99.03%	100%	97.45%
Standard Deviation	1.4%			
Apache Spark - 40000000 - 2000 - R.T.T (sec)	**39.39**	**39.03**	39.06	39.15
Normalized	99.09%	100%	99.92%	99.69%
Standard Deviation	1.3%			
Apache Spark - 40000000 - 2000 - I.J.T.T (sec)	44.38	**45.44**	43.73	**43.57**
Normalized	98.17%	95.88%	99.63%	100%
Standard Deviation	0.7%			
Apache Spark - 40000000 - 2000 - B.I.J.T.T (sec)	**43.67**	**43.40**	43.57	43.45
Normalized	99.38%	100%	99.61%	99.88%
Standard Deviation	1.5%			
ASTC Encoder - Fast (MT/s)	285.1810	284.7715	**286.2078**	**284.2022**
Normalized	99.64%	99.5%	100%	99.3%
Standard Deviation	0.3%			
ASTC Encoder - Medium (MT/s)	**98.4276**	98.5245	**98.6542**	98.5837
Normalized	99.77%	99.87%	100%	99.93%
Standard Deviation	0.1%			
ASTC Encoder - Thorough (MT/s)	**12.1037**	12.1053	12.1481	**12.1539**
Normalized	99.59%	99.6%	99.95%	100%
Standard Deviation	0.3%			
ASTC Encoder - Exhaustive (MT/s)	**1.2751**	1.2782	**1.2837**	1.2826
Normalized	99.33%	99.57%	100%	99.91%
Standard Deviation	0.3%			
Inkscape - SVG Files To PNG (sec)	**17.494**	**17.698**	17.578	17.64
Normalized	100%	98.85%	99.52%	99.17%
Standard Deviation	2.8%			
AI Benchmark Alpha - D.I.S (Score)	**1412**	1377	**1361**	1383
Normalized	100%	97.52%	96.39%	97.95%
AI Benchmark Alpha - D.T.S (Score)	**1140**	1128	**1126**	1134
Normalized	100%	98.95%	98.77%	99.47%
AI Benchmark Alpha - Device AI Score (Score)	**2552**	2505	**2487**	2517
Normalized	100%	98.16%	97.45%	98.63%


LAMMPS Molecular Dynamics Simulator 23Jun2022
Model: 20k Atoms
ns/day, More Is Better
A
B
C
D
SE +/- 0.04, N = 3
12.65
12.58
12.69
12.56
3
6
9
12
15
1. (CXX) g++ options: -O3 -lm -ldl
LAMMPS Molecular Dynamics Simulator 23Jun2022
Model: Rhodopsin Protein
ns/day, More Is Better
A
B
C
D
SE +/- 0.13, N = 5
12.58
12.36
12.61
12.74
3
6
9
12
15
1. (CXX) g++ options: -O3 -lm -ldl


SVT-AV1 1.2
Encoder Mode: Preset 4 - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.005, N = 3
A
B
C
D
2.433
2.414
2.428
2.420
0.5474
1.0948
1.6422
2.1896
2.737
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq
SVT-AV1 1.2
Encoder Mode: Preset 8 - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.05, N = 3
A
B
C
D
52.03
51.54
50.48
51.02
12
24
36
48
60
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq

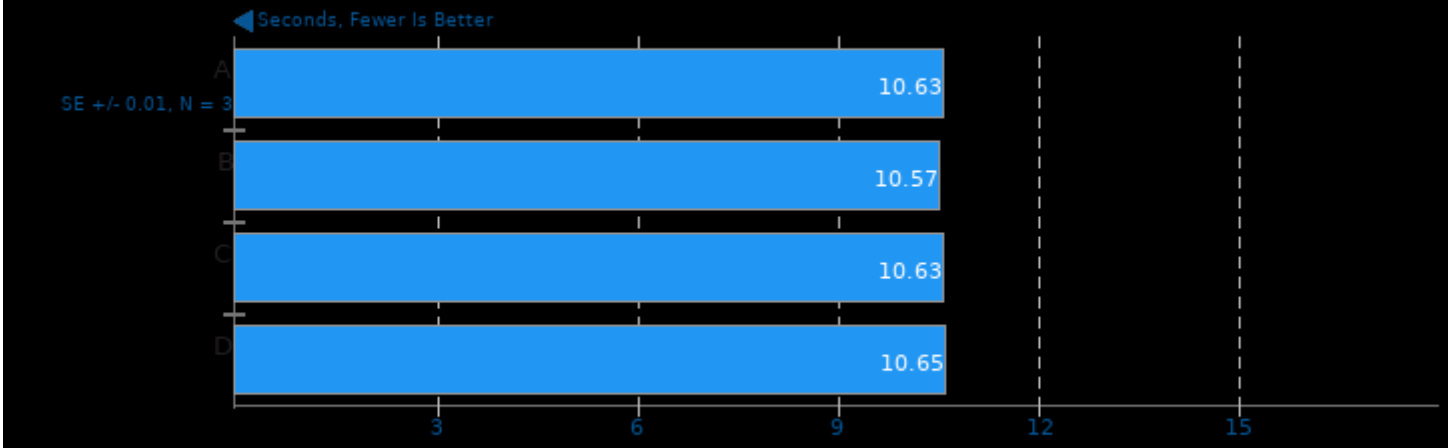

SVT-AV1 1.2
Encoder Mode: Preset 10 - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.57, N = 3
A
B
C
D
89.62
88.18
88.08
86.74
20
40
60
80
100
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq
SVT-AV1 1.2
Encoder Mode: Preset 12 - Input: Bosphorus 4K
Frames Per Second, More Is Better
SE +/- 0.12, N = 3
A
B
C
D
119.52
117.61
112.78
112.21
30
60
90
120
150
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq


SVT-AV1 1.2
Encoder Mode: Preset 4 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.061, N = 3
A
B
C
D
7.093
7.087
7.206
7.061
2
4
6
8
10
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq
SVT-AV1 1.2
Encoder Mode: Preset 8 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.73, N = 3
A
B
C
D
142.24
143.36
140.85
141.94
30
60
90
120
150
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq


SVT-AV1 1.2
Encoder Mode: Preset 10 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 0.90, N = 3
A
B
C
D
305.71
303.45
300.67
298.75
70
140
210
280
350
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq
SVT-AV1 1.2
Encoder Mode: Preset 12 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
SE +/- 3.06, N = 3
A
B
C
D
446.75
443.17
441.57
439.84
100
200
300
400
500
1. (CXX) g++ options: -march=native -mno-avx -mavx2 -mavx512f -mavx512bw -mavx512dq

Primesieve 8.0

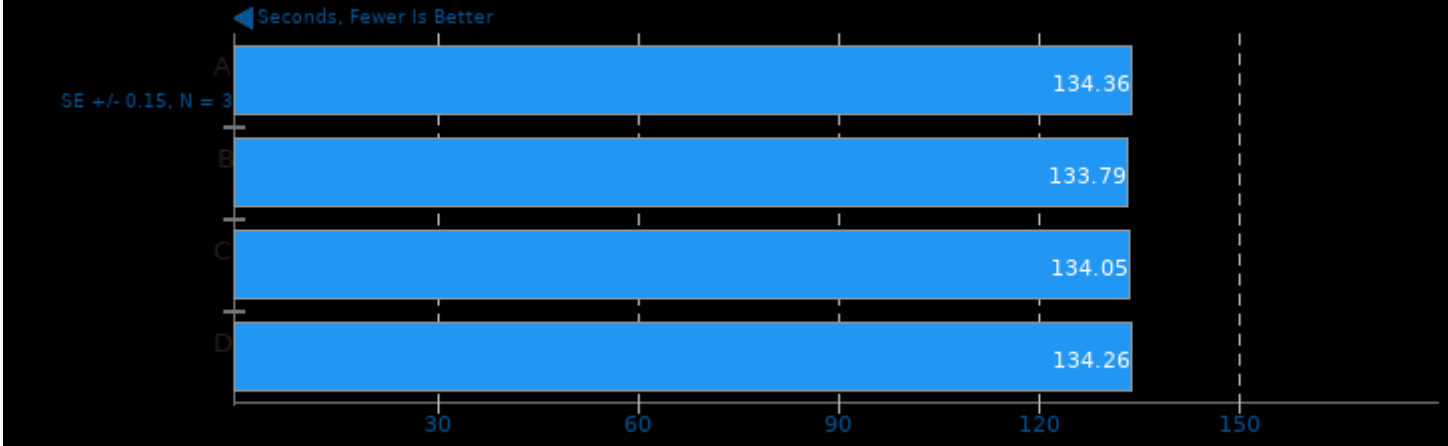
Length: 1e12



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

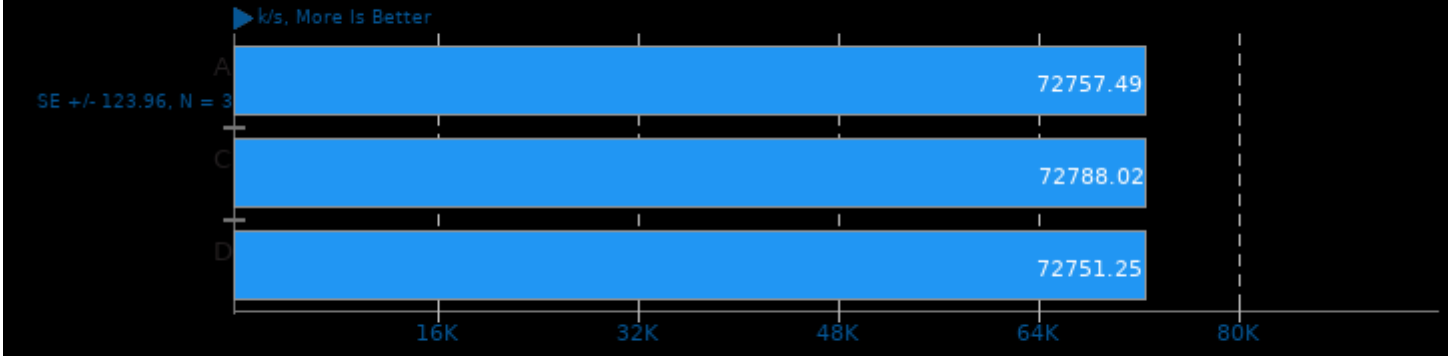
Primesieve 8.0

Length: 1e13

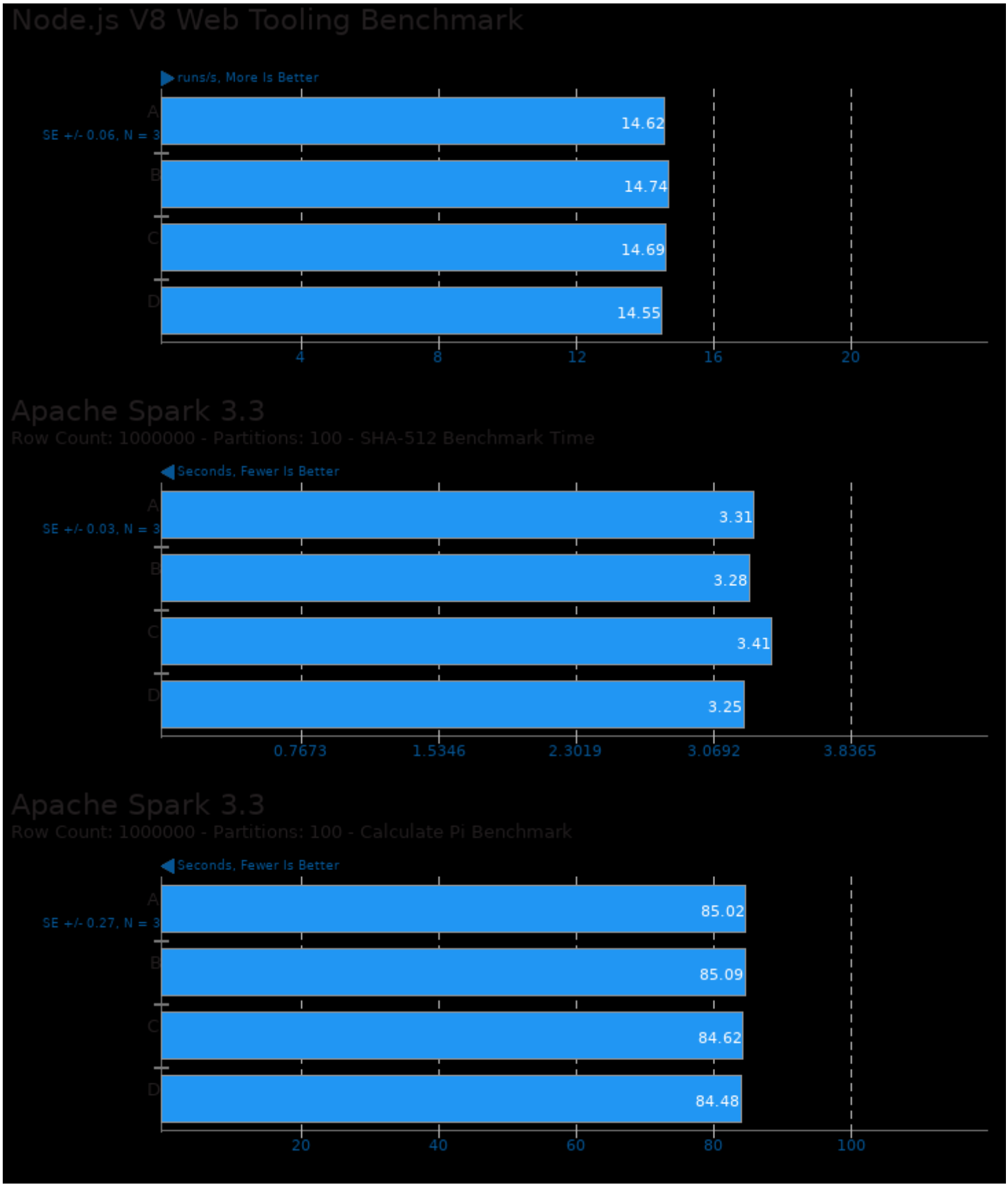


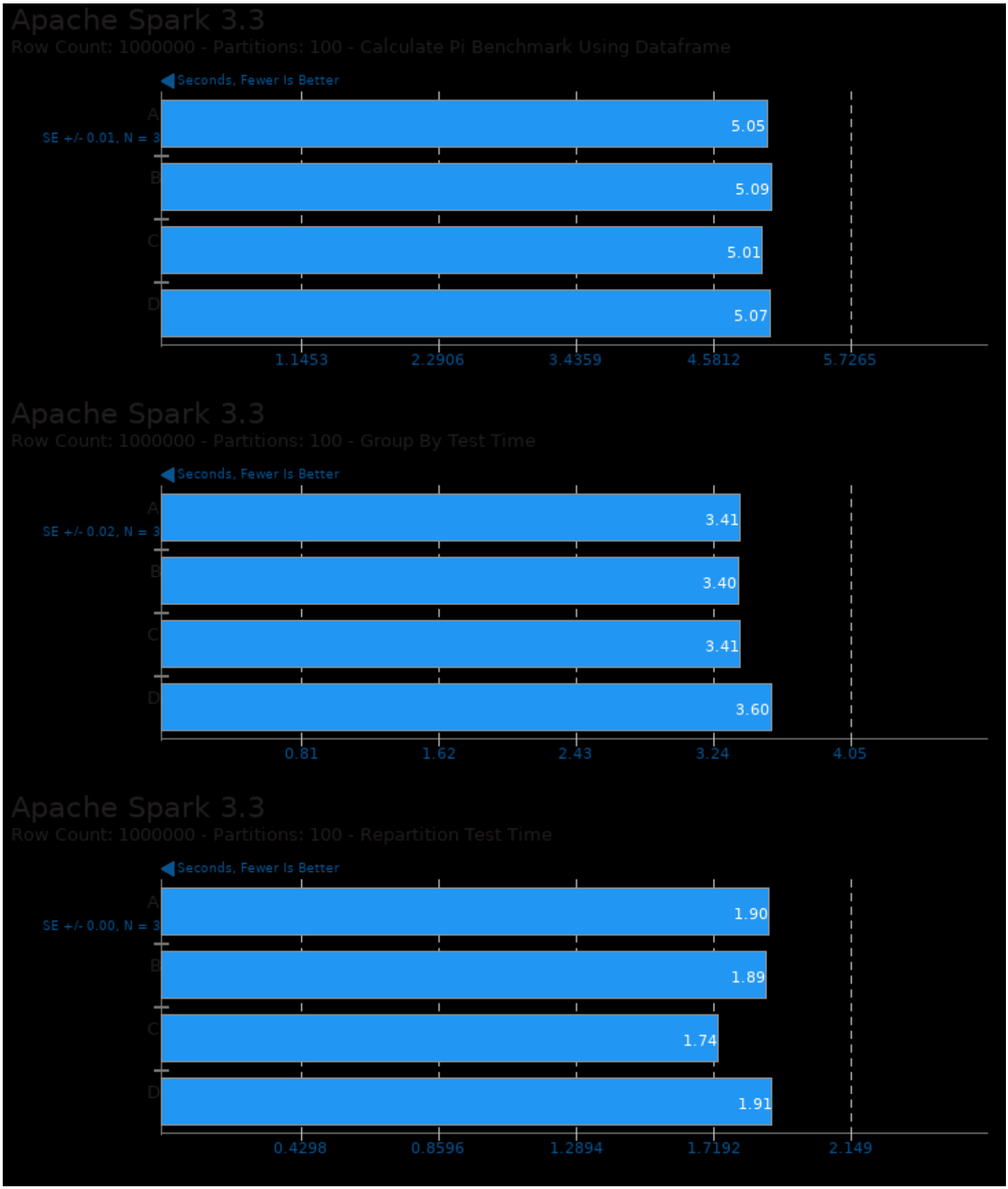
1. (CXX) g++ options: -O3

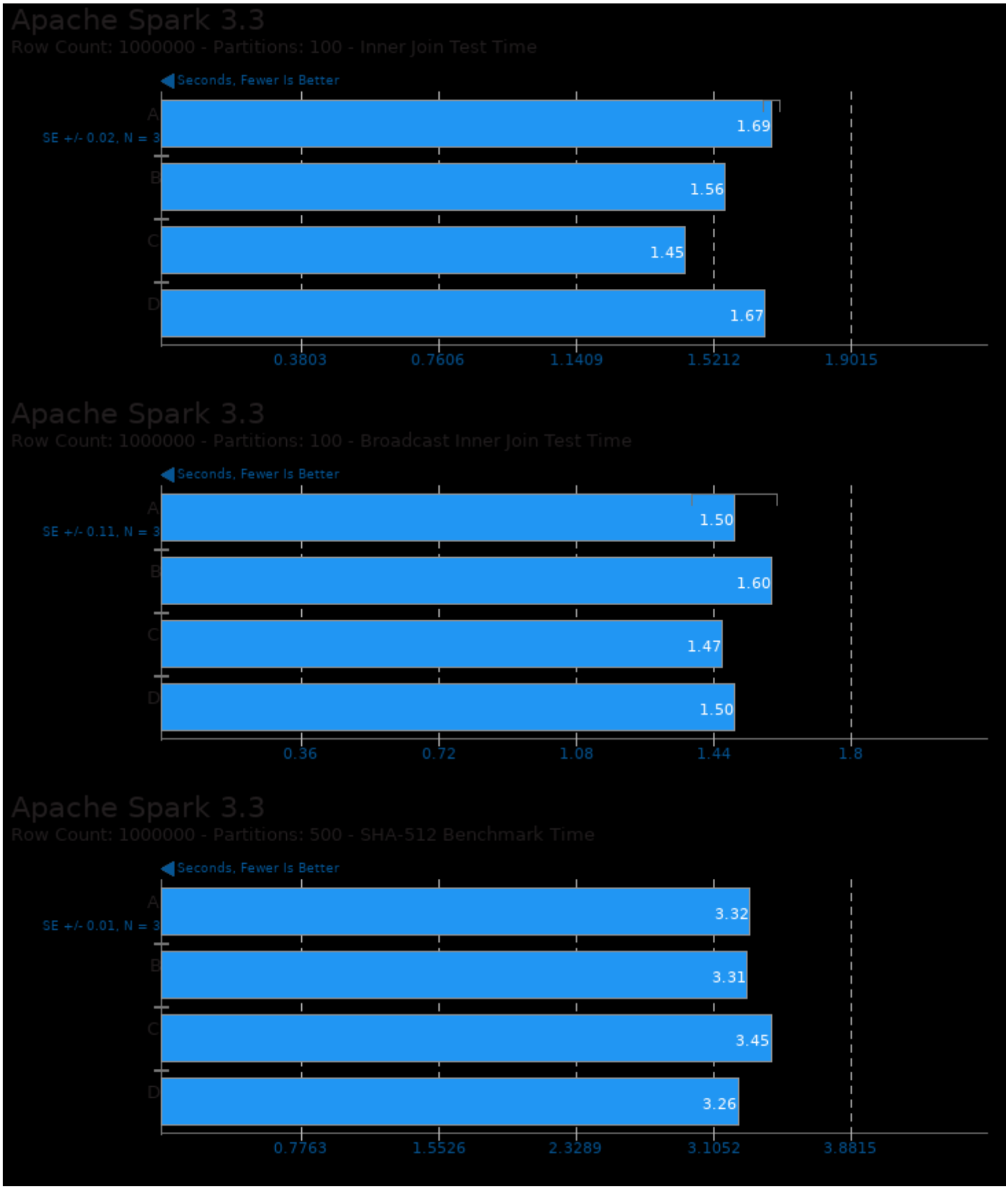
Aircrack-ng 1.7

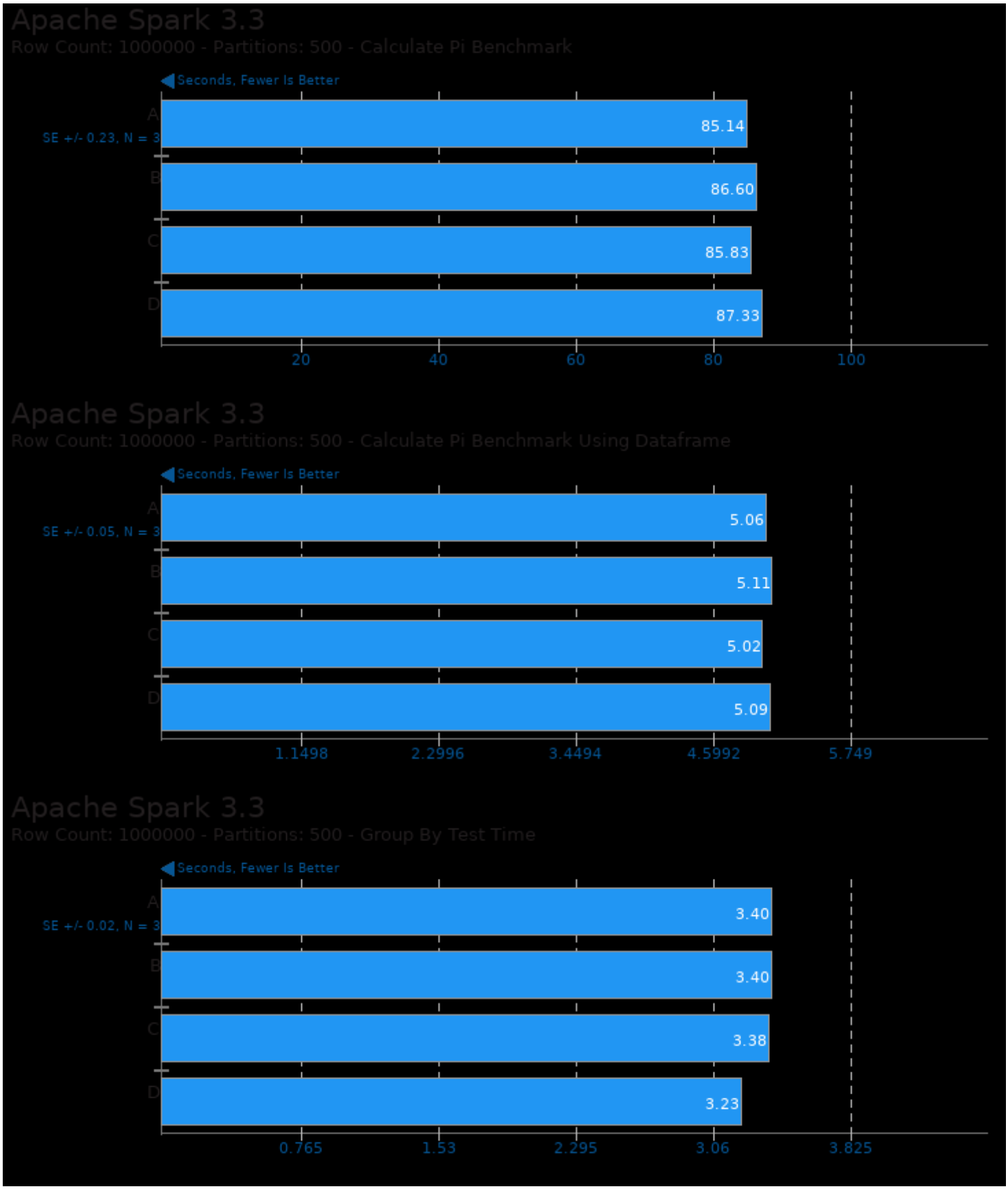


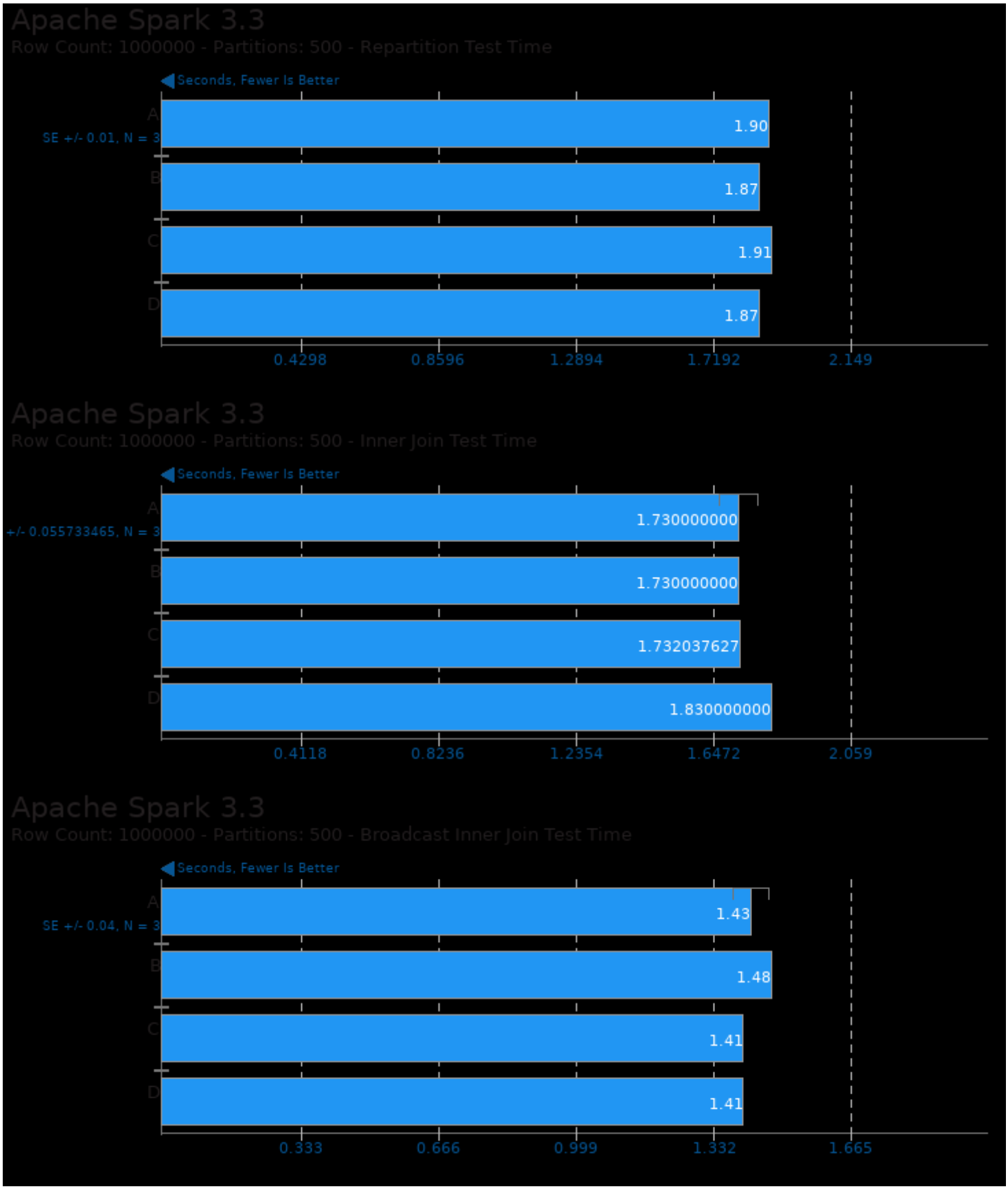
1. (CXX) g++ options: -std=gnu++17 -O3 -fvisibility=hidden -fcommon -rdynamic -lnl-3 -lnl-genl-3 -lpcre -lpthread -lz -lssl -lcrypto -lhwloc -ldl -lm -pthre

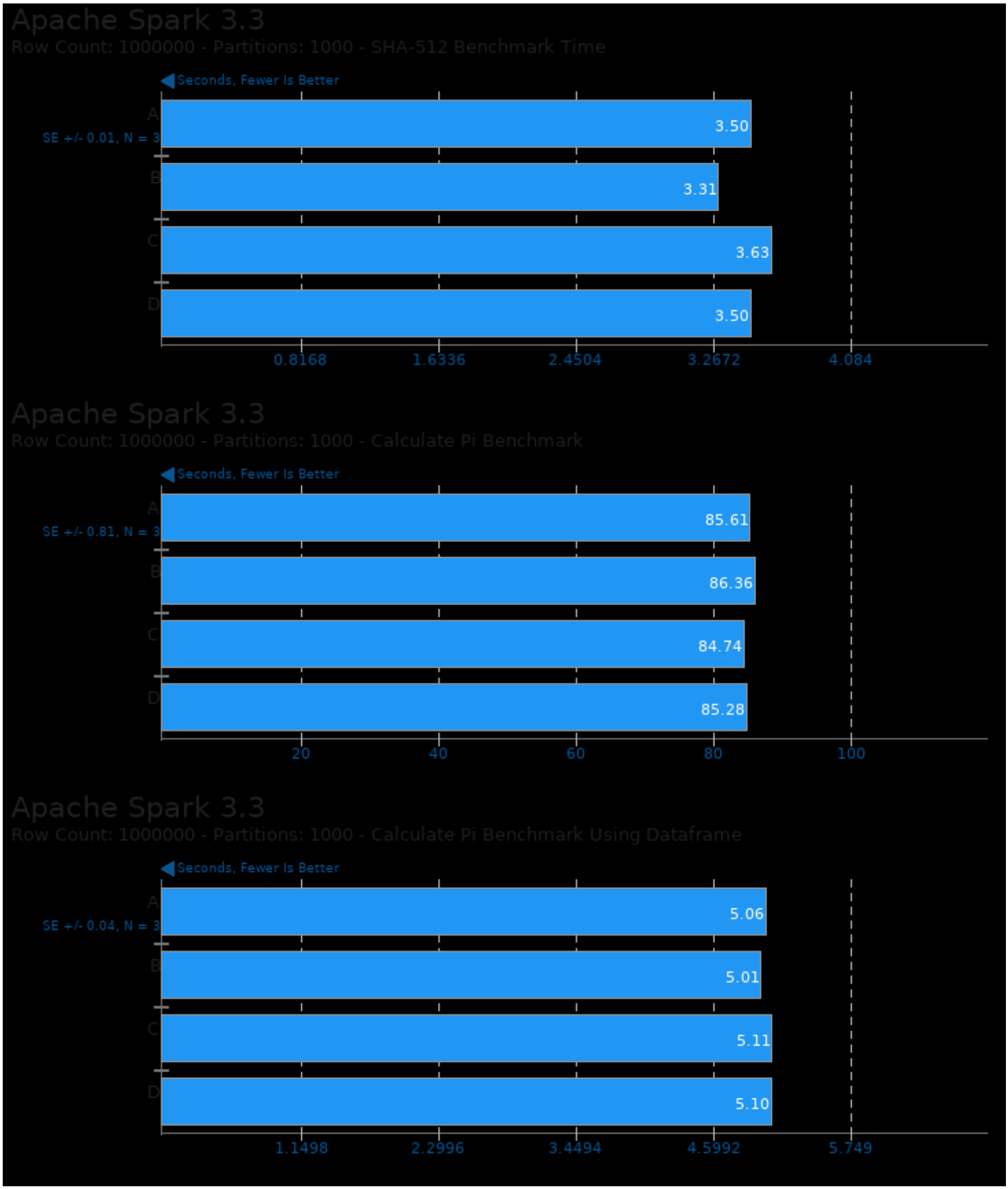

Node.js V8 Web Tooling Benchmark
runs/s, More Is Better
SE +/- 0.06, N = 3
A
14.62
B
14.74
C
14.69
D
14.55
4
8
12
16
20
Apache Spark 3.3
Row Count: 1000000 - Partitions: 100 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.03, N = 3
A
3.31
B
3.28
C
3.41
D
3.25
0.7673
1.5346
2.3019
3.0692
3.8365
Apache Spark 3.3
Row Count: 1000000 - Partitions: 100 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.27, N = 3
A
85.02
B
85.09
C
84.62
D
84.48
20
40
60
80
100

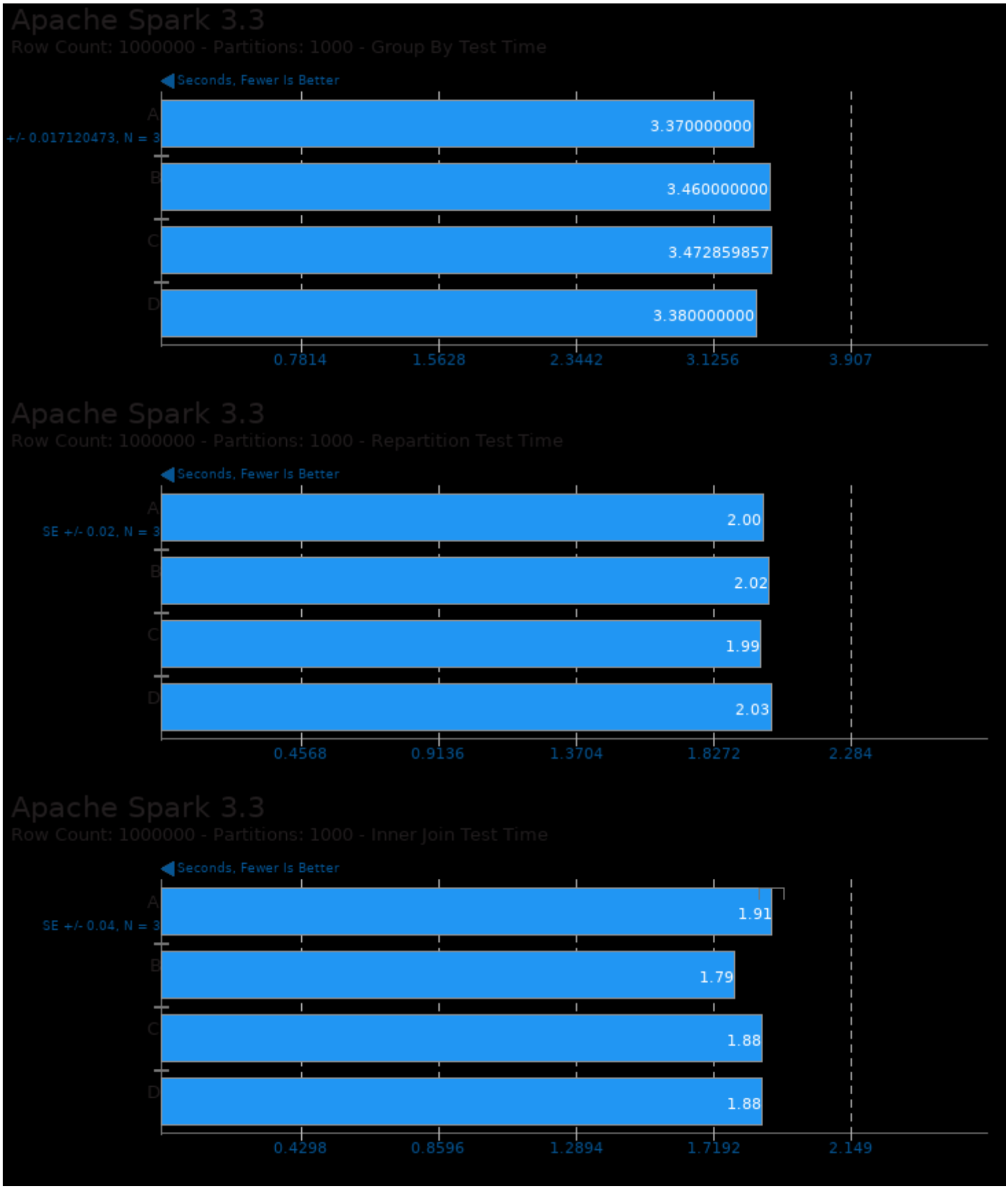

Apache Spark 3.3
Row Count: 1000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
5.05
B
5.09
C
5.01
D
5.07
1.1453
2.2906
3.4359
4.5812
5.7265
Apache Spark 3.3
Row Count: 1000000 - Partitions: 100 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
A
3.41
B
3.40
C
3.41
D
3.60
0.81
1.62
2.43
3.24
4.05
Apache Spark 3.3
Row Count: 1000000 - Partitions: 100 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.00, N = 3
A
1.90
B
1.89
C
1.74
D
1.91
0.4298
0.8596
1.2894
1.7192
2.149

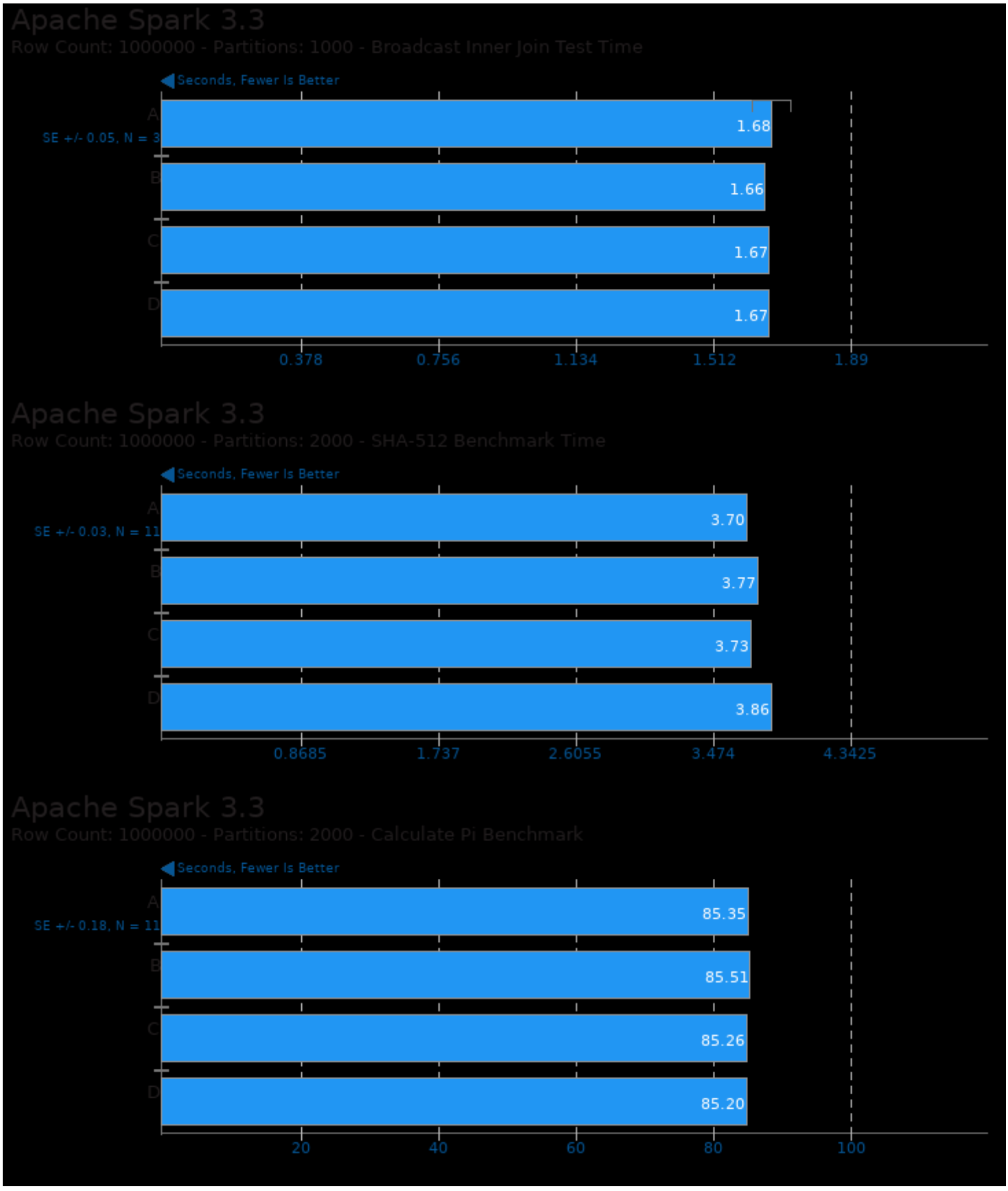

Apache Spark 3.3
Row Count: 1000000 - Partitions: 100 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
A
B
C
D
1.69
1.56
1.45
1.67
0.3803
0.7606
1.1409
1.5212
1.9015
Apache Spark 3.3
Row Count: 1000000 - Partitions: 100 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.11, N = 3
A
B
C
D
1.50
1.60
1.47
1.50
0.36
0.72
1.08
1.44
1.8
Apache Spark 3.3
Row Count: 1000000 - Partitions: 500 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
B
C
D
3.32
3.31
3.45
3.26
0.7763
1.5526
2.3289
3.1052
3.8815

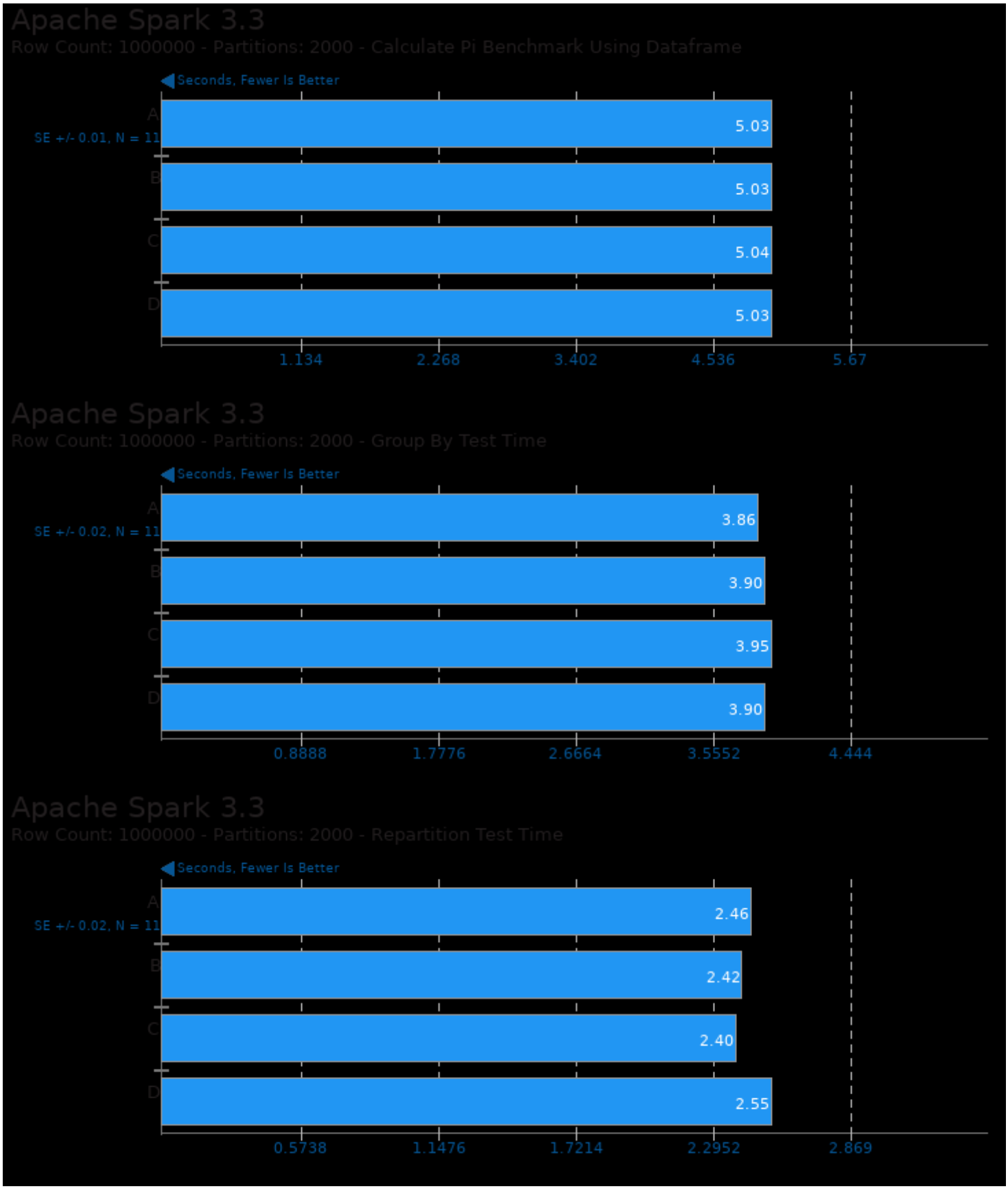

Apache Spark 3.3
Row Count: 1000000 - Partitions: 500 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.23, N = 3
A
85.14
B
86.60
C
85.83
D
87.33
20
40
60
80
100
Apache Spark 3.3
Row Count: 1000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
A
5.06
B
5.11
C
5.02
D
5.09
1.1498
2.2996
3.4494
4.5992
5.749
Apache Spark 3.3
Row Count: 1000000 - Partitions: 500 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
A
3.40
B
3.40
C
3.38
D
3.23
0.765
1.53
2.295
3.06
3.825

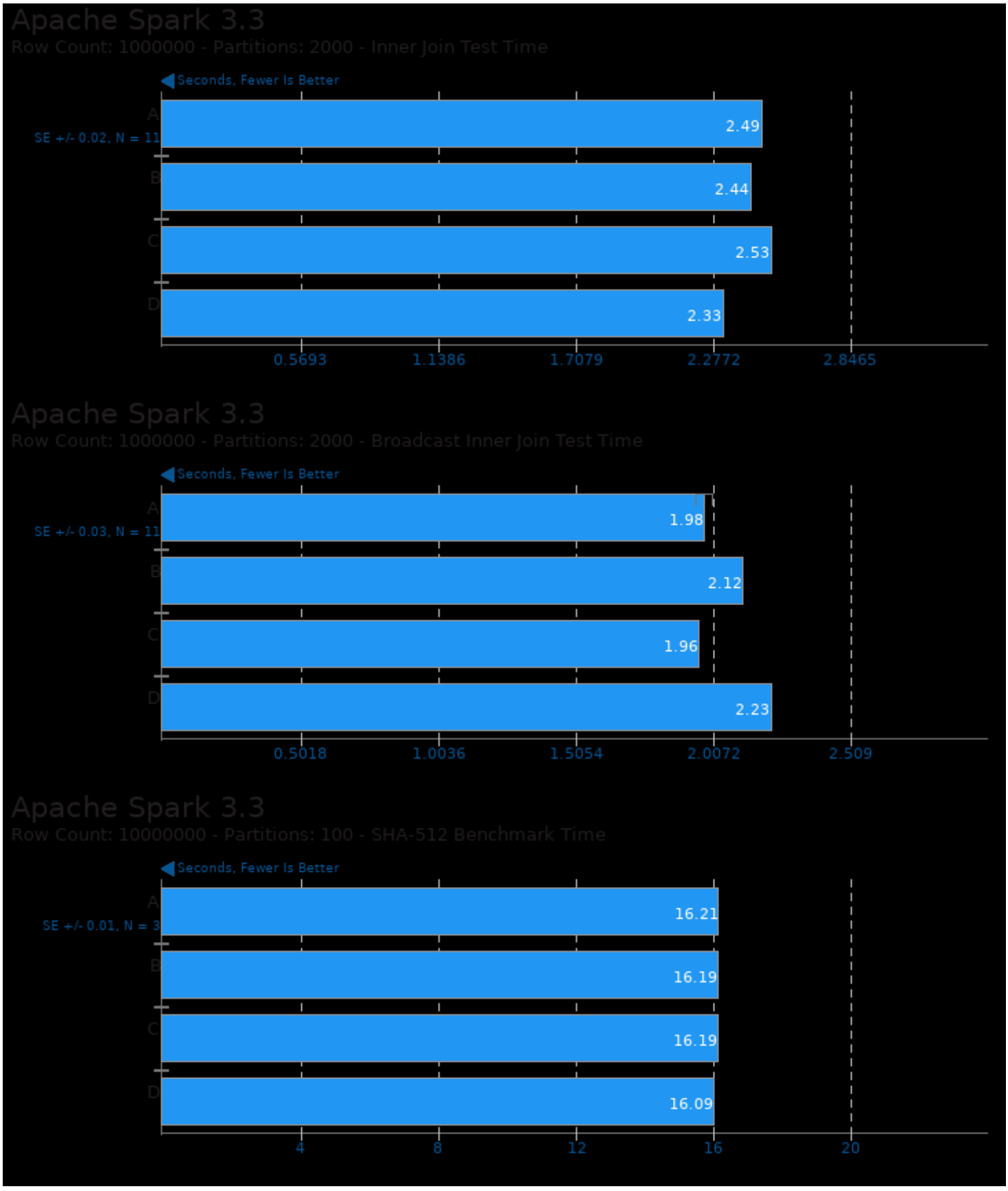

Apache Spark 3.3
Row Count: 1000000 - Partitions: 500 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
1.90
B
1.87
C
1.91
D
1.87
0.4298
0.8596
1.2894
1.7192
2.149
Apache Spark 3.3
Row Count: 1000000 - Partitions: 500 - Inner Join Test Time
Seconds, Fewer Is Better
+/- 0.055733465, N = 3
A
1.730000000
B
1.730000000
C
1.732037627
D
1.830000000
0.4118
0.8236
1.2354
1.6472
2.059
Apache Spark 3.3
Row Count: 1000000 - Partitions: 500 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 3
A
1.43
B
1.48
C
1.41
D
1.41
0.333
0.666
0.999
1.332
1.665

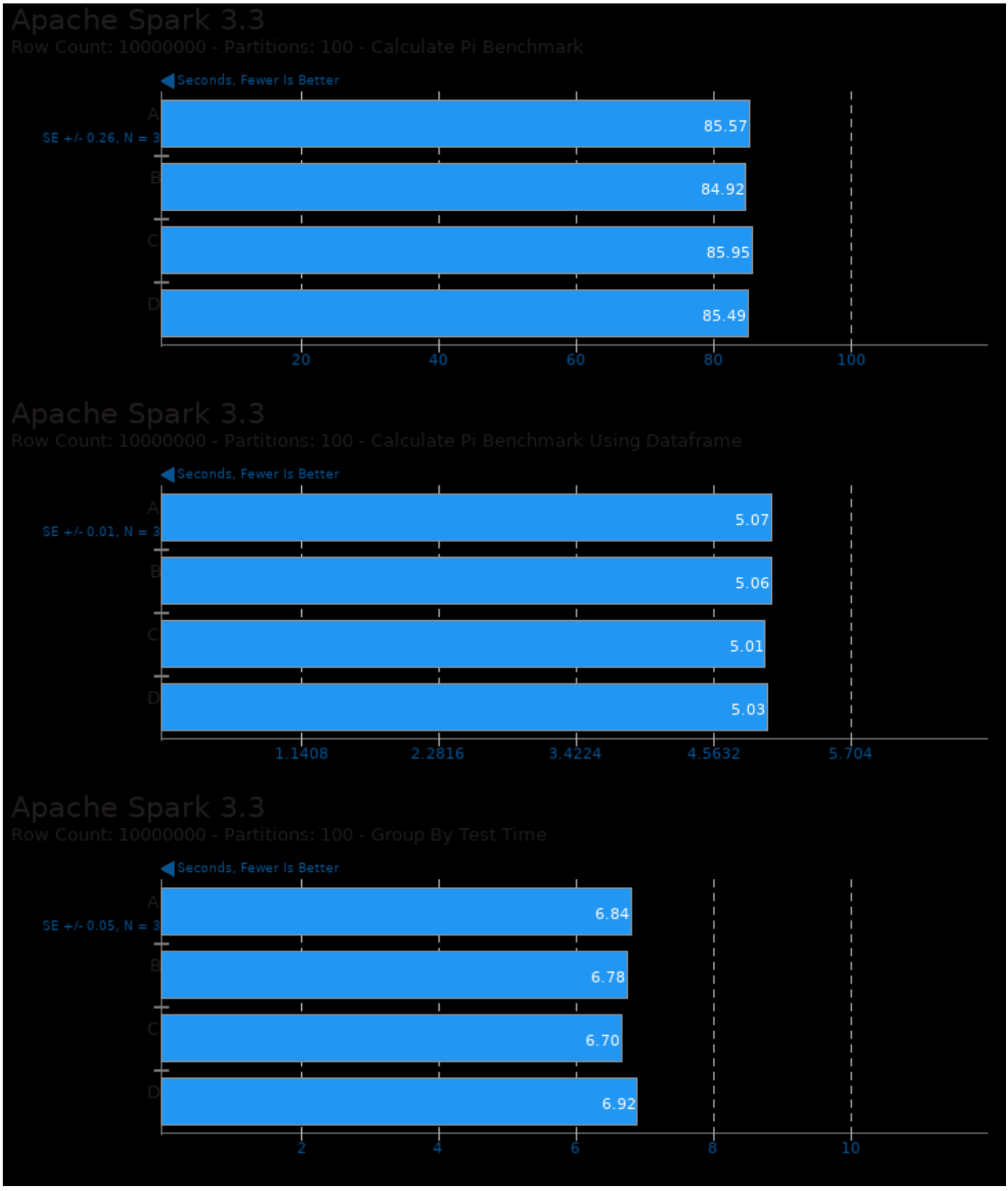

Apache Spark 3.3
Row Count: 1000000 - Partitions: 1000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
3.50
B
3.31
C
3.63
D
3.50
0.8168
1.6336
2.4504
3.2672
4.084
Apache Spark 3.3
Row Count: 1000000 - Partitions: 1000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.81, N = 3
A
85.61
B
86.36
C
84.74
D
85.28
20
40
60
80
100
Apache Spark 3.3
Row Count: 1000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.04, N = 3
A
5.06
B
5.01
C
5.11
D
5.10
1.1498
2.2996
3.4494
4.5992
5.749

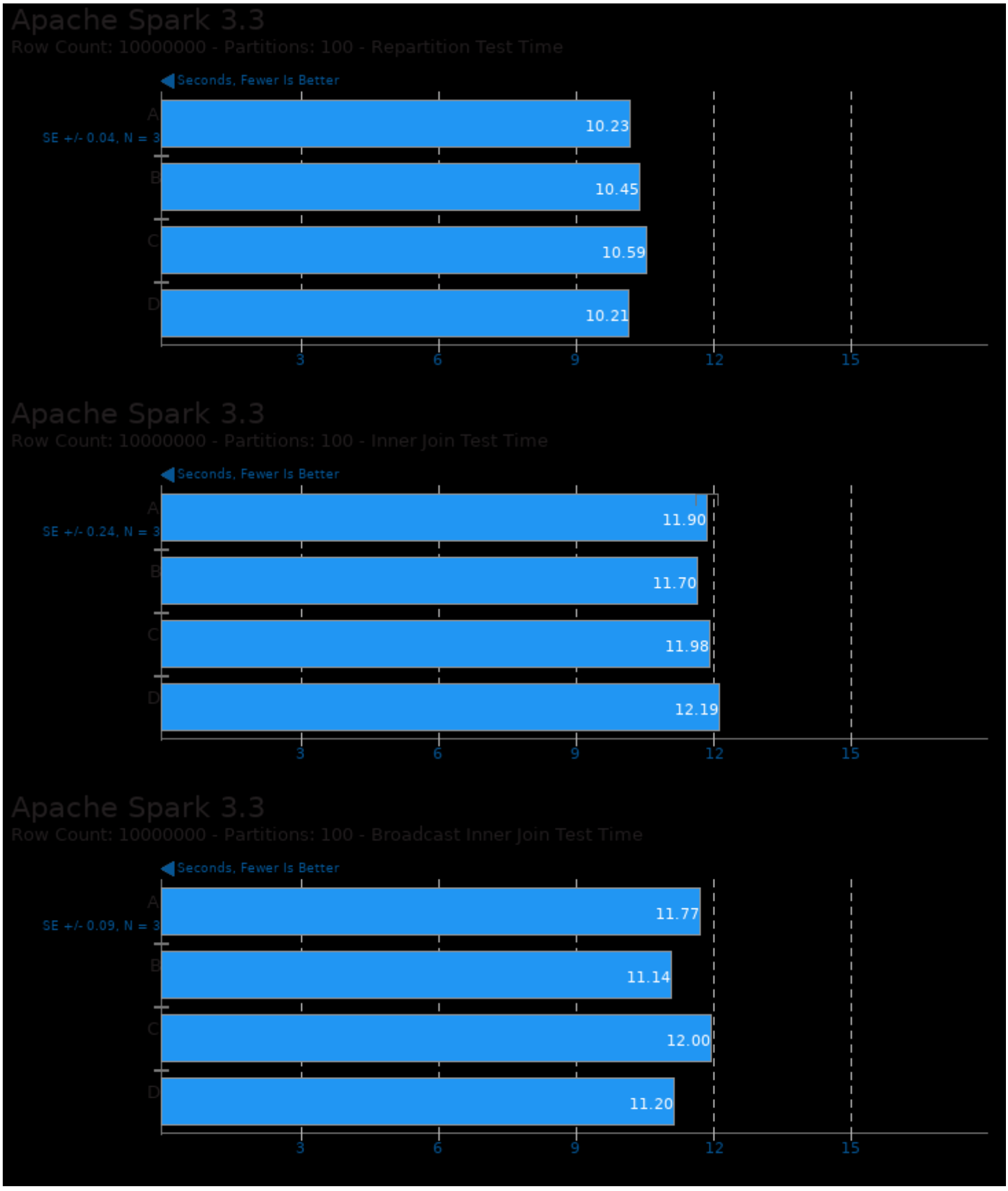

Apache Spark 3.3
Row Count: 1000000 - Partitions: 1000 - Group By Test Time
Seconds, Fewer Is Better
+/- 0.017120473, N = 3
A
3.370000000
B
3.460000000
C
3.472859857
D
3.380000000
0.7814
1.5628
2.3442
3.1256
3.907
Apache Spark 3.3
Row Count: 1000000 - Partitions: 1000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
A
2.00
B
2.02
C
1.99
D
2.03
0.4568
0.9136
1.3704
1.8272
2.284
Apache Spark 3.3
Row Count: 1000000 - Partitions: 1000 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 3
A
1.91
B
1.79
C
1.88
D
1.88
0.4298
0.8596
1.2894
1.7192
2.149

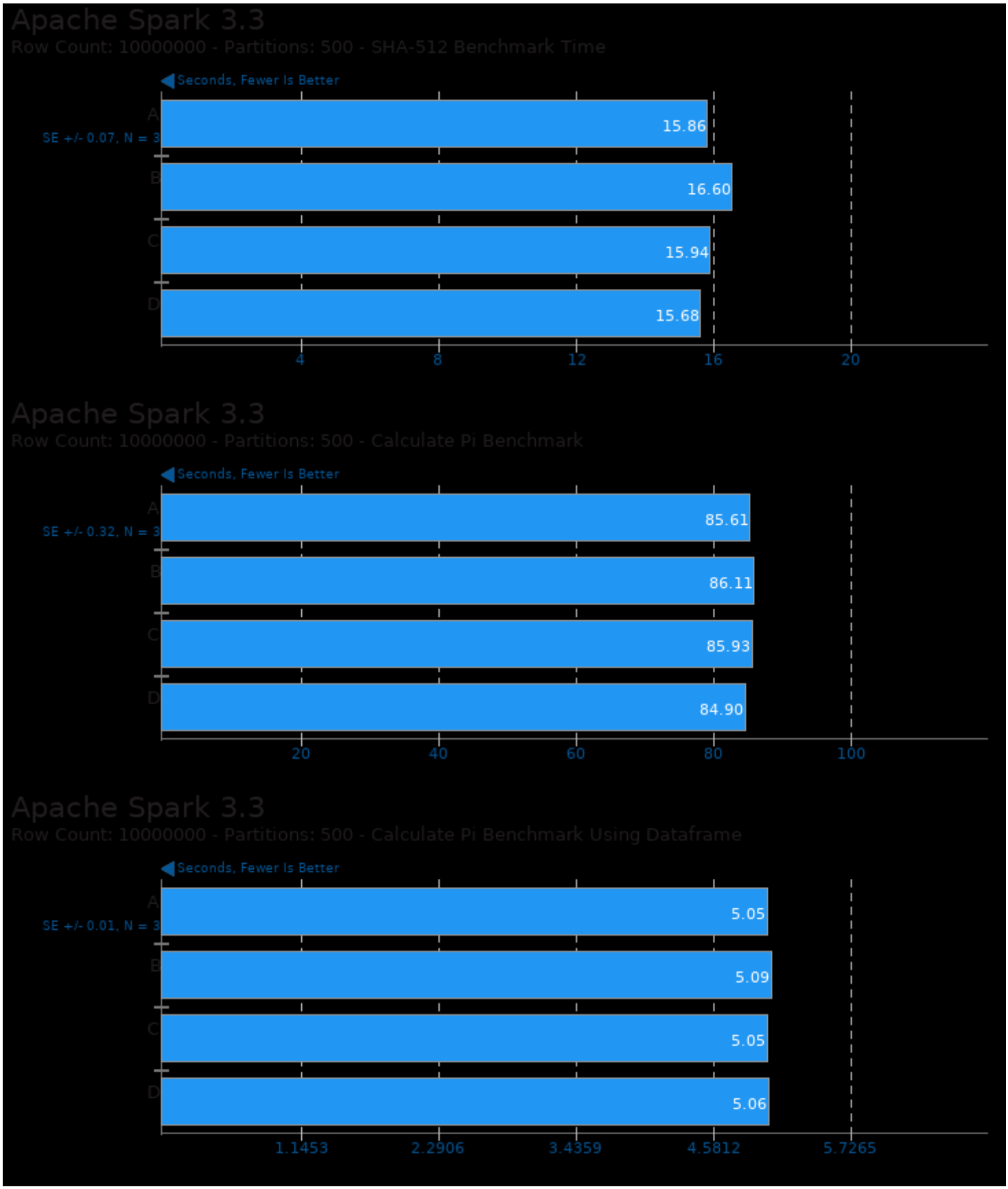

Apache Spark 3.3
Row Count: 1000000 - Partitions: 1000 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
A
B
C
D
1.68
1.66
1.67
1.67
0.378
0.756
1.134
1.512
1.89
Apache Spark 3.3
Row Count: 1000000 - Partitions: 2000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.03, N = 11
A
B
C
D
3.70
3.77
3.73
3.86
0.8685
1.737
2.6055
3.474
4.3425
Apache Spark 3.3
Row Count: 1000000 - Partitions: 2000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.18, N = 11
A
B
C
D
85.35
85.51
85.26
85.20
20
40
60
80
100

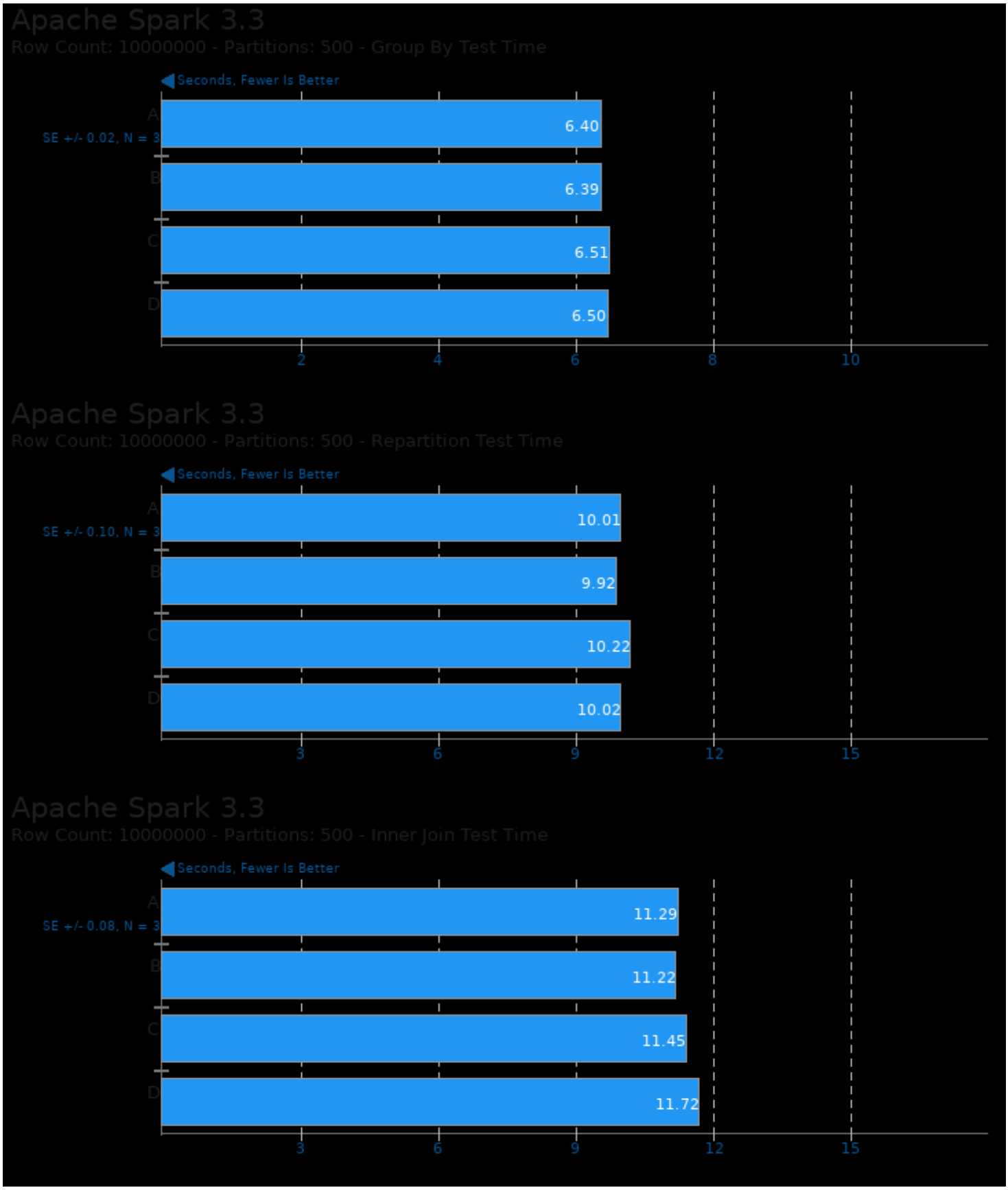

Apache Spark 3.3
Row Count: 1000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 11
A
B
C
D
5.03
5.03
5.04
5.03
1.134
2.268
3.402
4.536
5.67
Apache Spark 3.3
Row Count: 1000000 - Partitions: 2000 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 11
A
B
C
D
3.86
3.90
3.95
3.90
0.8888
1.7776
2.6664
3.5552
4.444
Apache Spark 3.3
Row Count: 1000000 - Partitions: 2000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 11
A
B
C
D
2.46
2.42
2.40
2.55
0.5738
1.1476
1.7214
2.2952
2.869

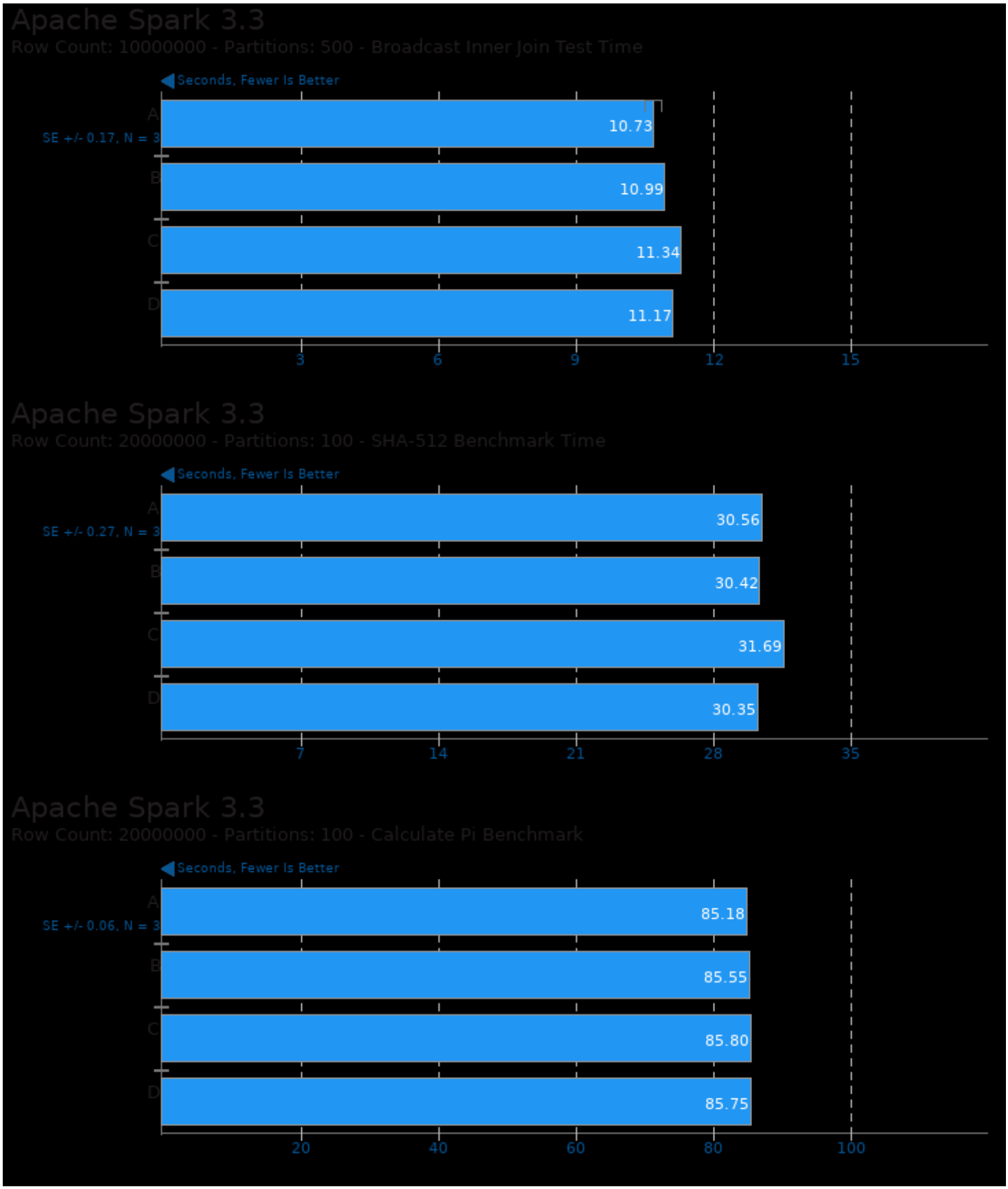

Apache Spark 3.3
Row Count: 1000000 - Partitions: 2000 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 11
A
B
C
D
2.49
2.44
2.53
2.33
0.5693
1.1386
1.7079
2.2772
2.8465
Apache Spark 3.3
Row Count: 1000000 - Partitions: 2000 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.03, N = 11
A
B
C
D
1.98
2.12
1.96
2.23
0.5018
1.0036
1.5054
2.0072
2.509
Apache Spark 3.3
Row Count: 10000000 - Partitions: 100 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
B
C
D
16.21
16.19
16.19
16.09
4
8
12
16
20

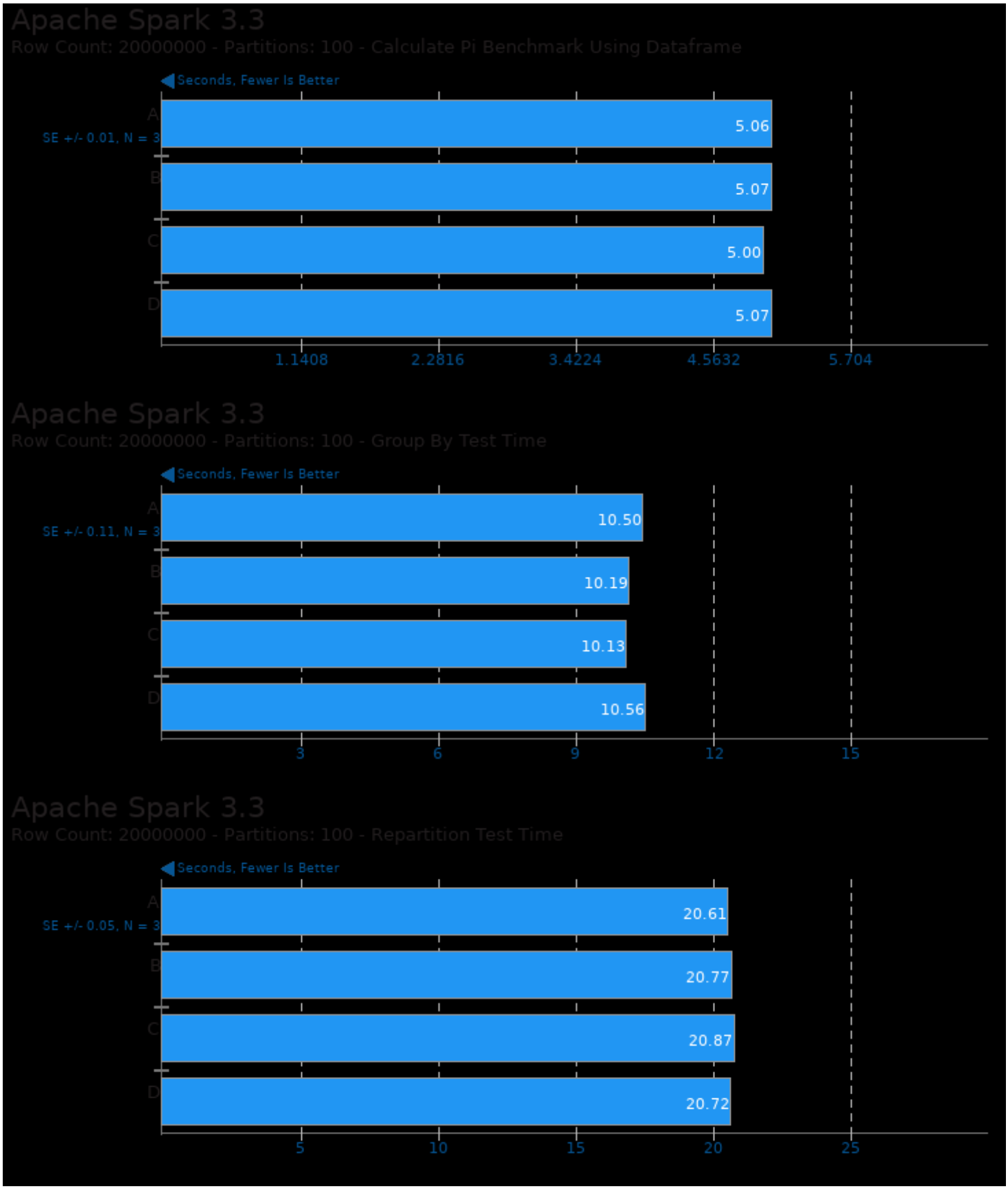

Apache Spark 3.3
Row Count: 10000000 - Partitions: 100 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.26, N = 3
A
B
C
D
85.57
84.92
85.95
85.49
20
40
60
80
100
Apache Spark 3.3
Row Count: 10000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
B
C
D
5.07
5.06
5.01
5.03
1.1408
2.2816
3.4224
4.5632
5.704
Apache Spark 3.3
Row Count: 10000000 - Partitions: 100 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
A
B
C
D
6.84
6.78
6.70
6.92
2
4
6
8
10

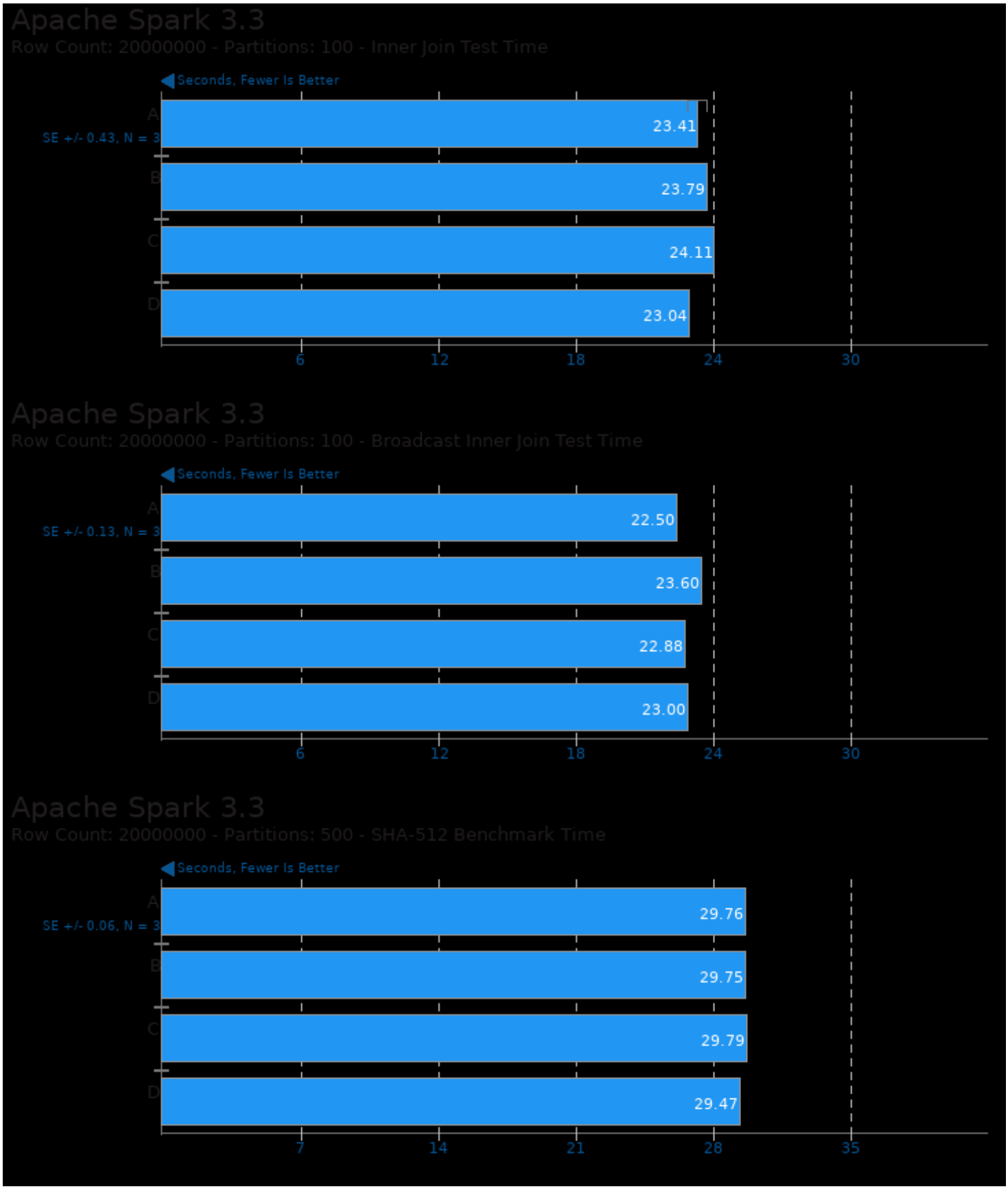

Apache Spark 3.3
Row Count: 10000000 - Partitions: 100 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 3
A
10.23
B
10.45
C
10.59
D
10.21
3
6
9
12
15
Apache Spark 3.3
Row Count: 10000000 - Partitions: 100 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.24, N = 3
A
11.90
B
11.70
C
11.98
D
12.19
3
6
9
12
15
Apache Spark 3.3
Row Count: 10000000 - Partitions: 100 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.09, N = 3
A
11.77
B
11.14
C
12.00
D
11.20
3
6
9
12
15

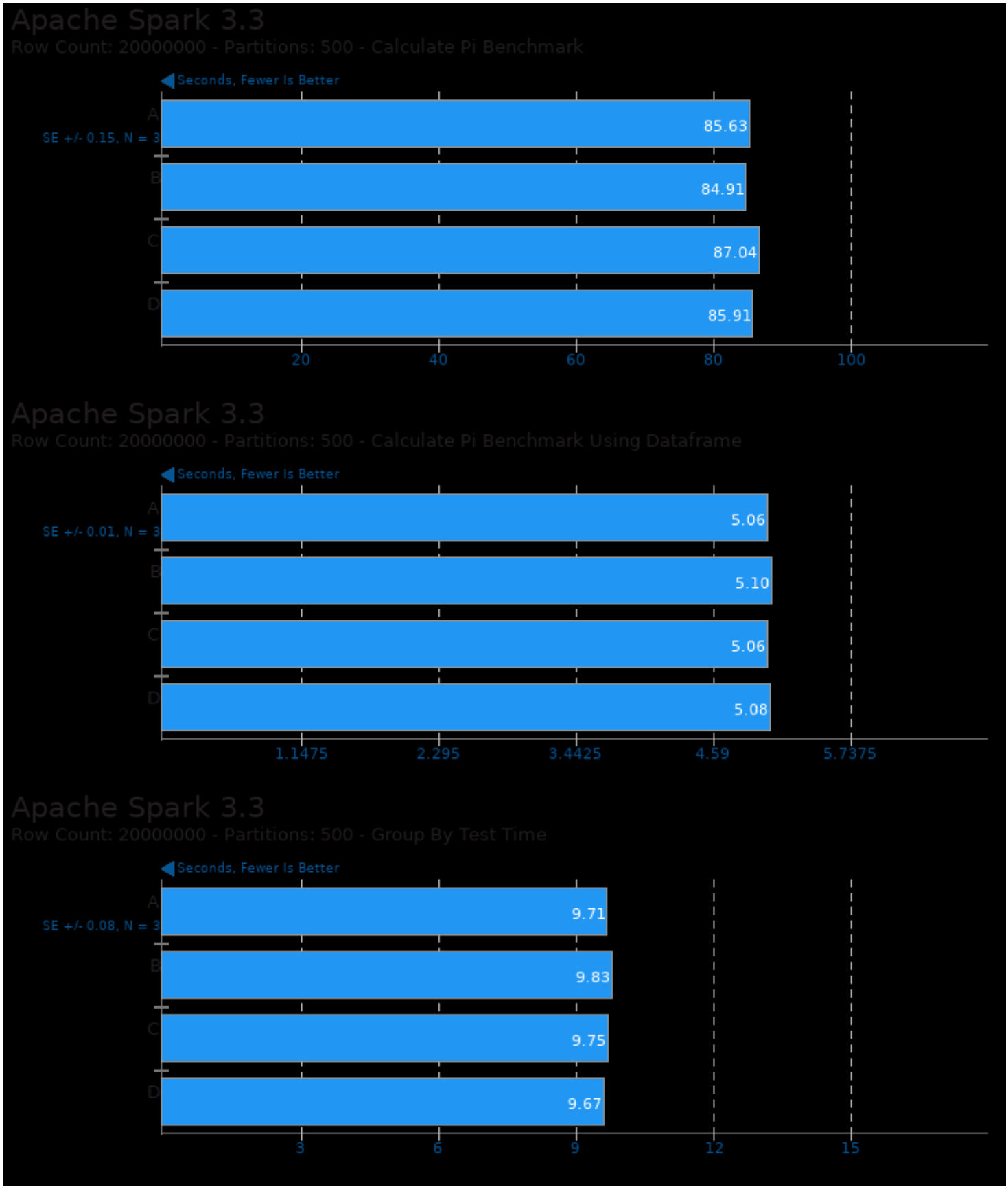

Apache Spark 3.3
Row Count: 10000000 - Partitions: 500 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.07, N = 3
A
15.86
B
16.60
C
15.94
D
15.68
4
8
12
16
20
Apache Spark 3.3
Row Count: 10000000 - Partitions: 500 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.32, N = 3
A
85.61
B
86.11
C
85.93
D
84.90
20
40
60
80
100
Apache Spark 3.3
Row Count: 10000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
5.05
B
5.09
C
5.05
D
5.06
1.1453
2.2906
3.4359
4.5812
5.7265

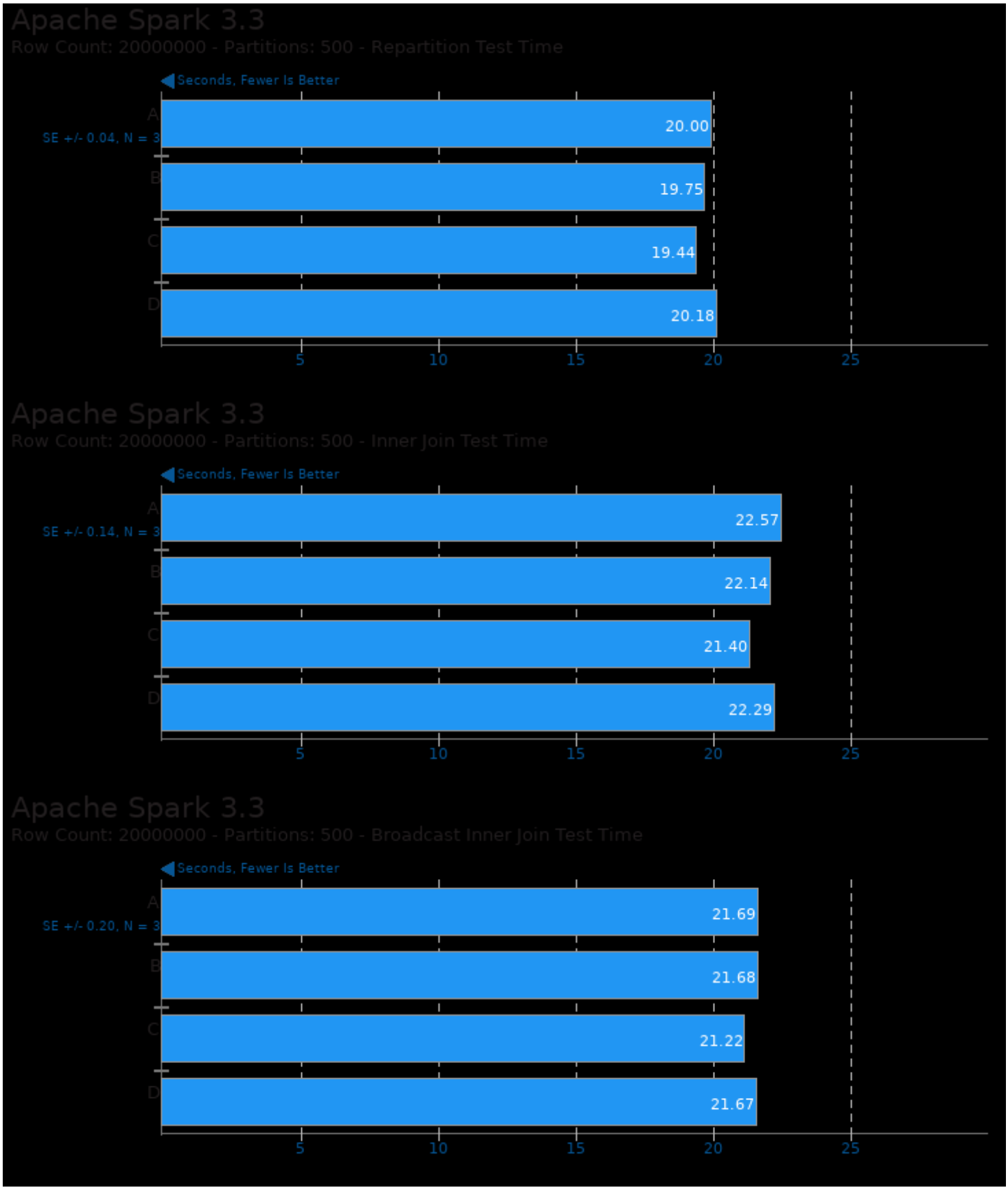

Apache Spark 3.3
Row Count: 10000000 - Partitions: 500 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
A
6.40
B
6.39
C
6.51
D
6.50
2
4
6
8
10
Apache Spark 3.3
Row Count: 10000000 - Partitions: 500 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.10, N = 3
A
10.01
B
9.92
C
10.22
D
10.02
3
6
9
12
15
Apache Spark 3.3
Row Count: 10000000 - Partitions: 500 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.08, N = 3
A
11.29
B
11.22
C
11.45
D
11.72
3
6
9
12
15

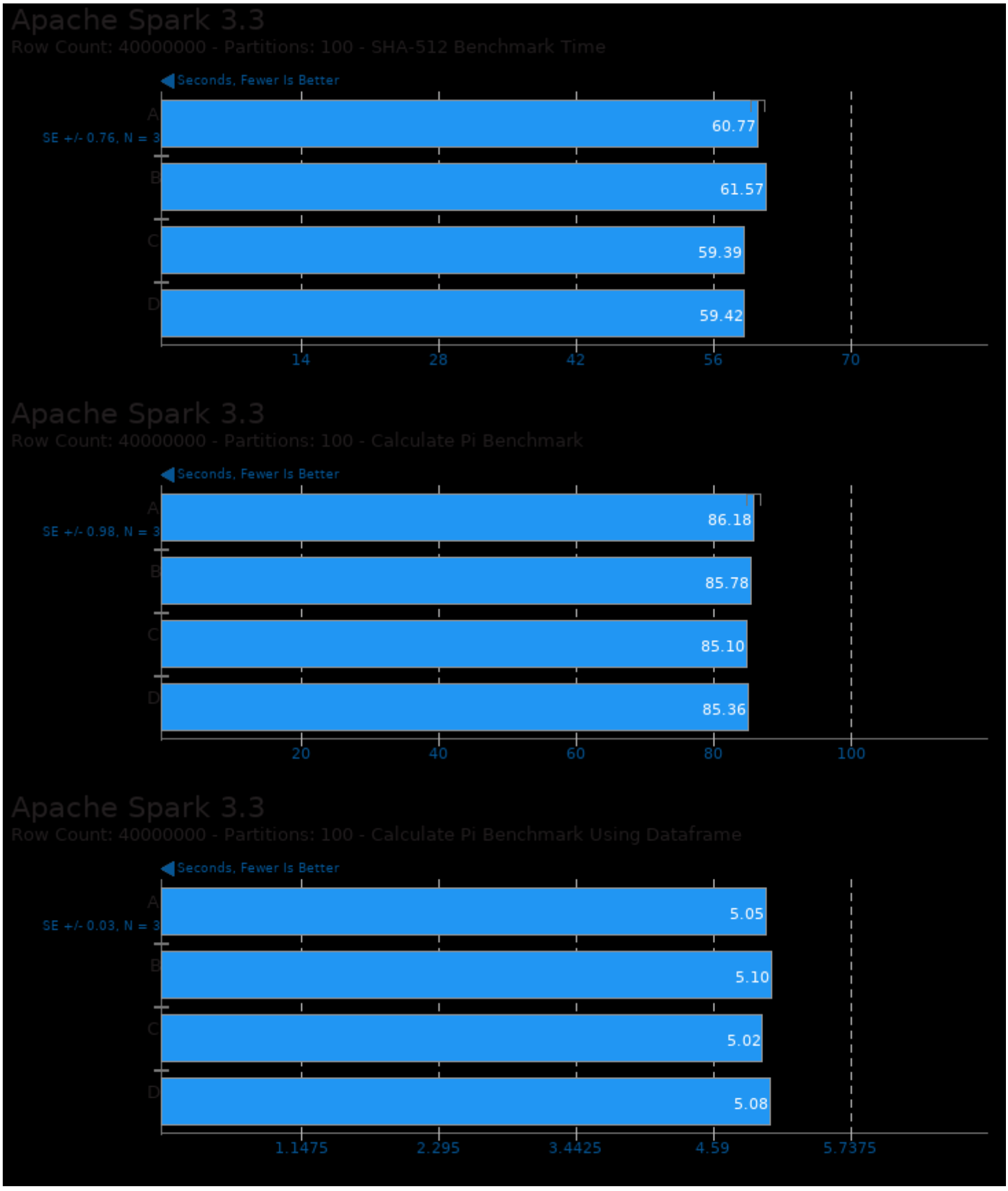

Apache Spark 3.3
Row Count: 10000000 - Partitions: 500 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.17, N = 3
A
10.73
B
10.99
C
11.34
D
11.17
3
6
9
12
15
Apache Spark 3.3
Row Count: 20000000 - Partitions: 100 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.27, N = 3
A
30.56
B
30.42
C
31.69
D
30.35
7
14
21
28
35
Apache Spark 3.3
Row Count: 20000000 - Partitions: 100 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.06, N = 3
A
85.18
B
85.55
C
85.80
D
85.75
20
40
60
80
100

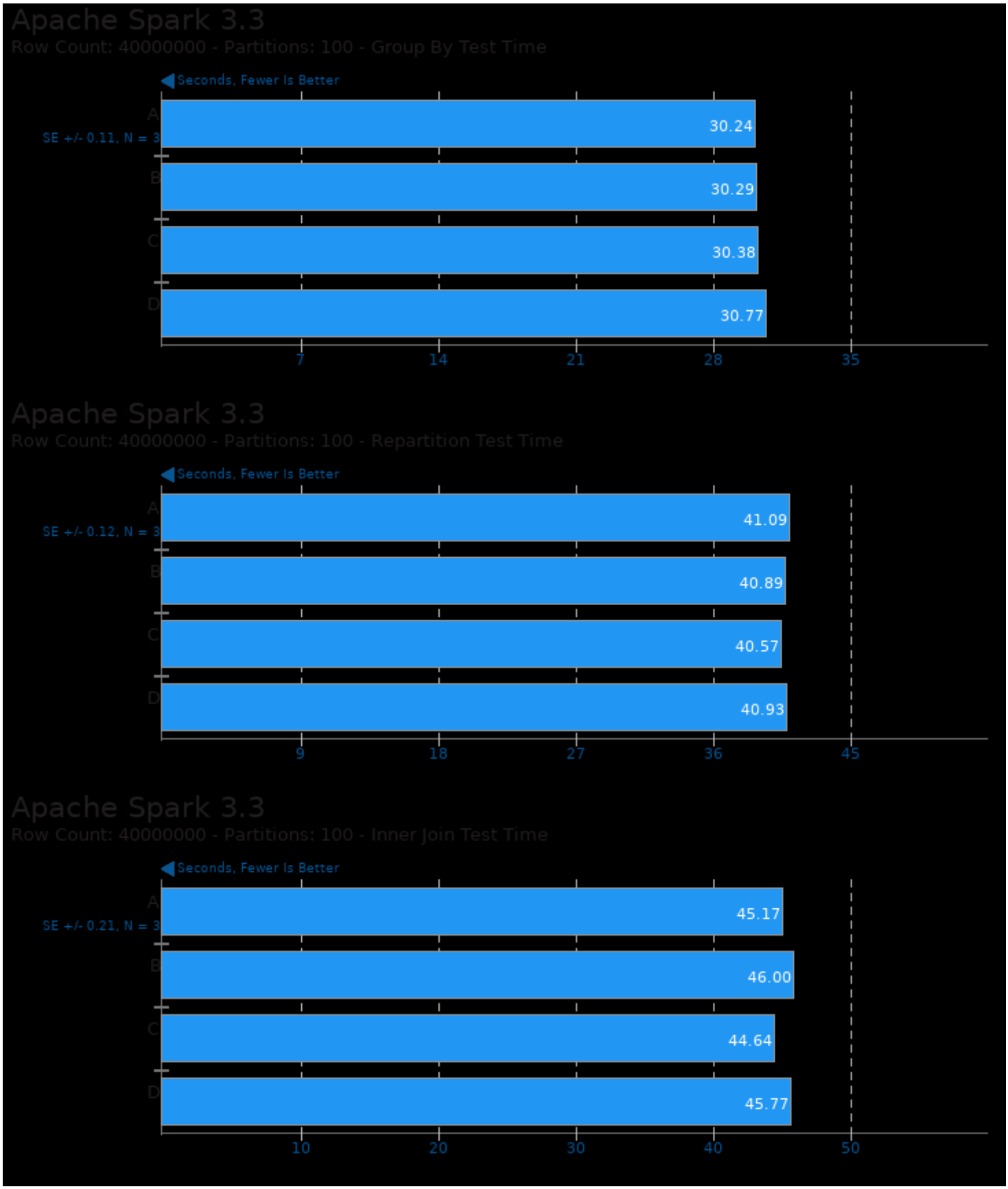

Apache Spark 3.3
Row Count: 20000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
B
C
D
5.06
5.07
5.00
5.07
1.1408
2.2816
3.4224
4.5632
5.704
Apache Spark 3.3
Row Count: 20000000 - Partitions: 100 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.11, N = 3
A
B
C
D
10.50
10.19
10.13
10.56
3
6
9
12
15
Apache Spark 3.3
Row Count: 20000000 - Partitions: 100 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.05, N = 3
A
B
C
D
20.61
20.77
20.87
20.72
5
10
15
20
25

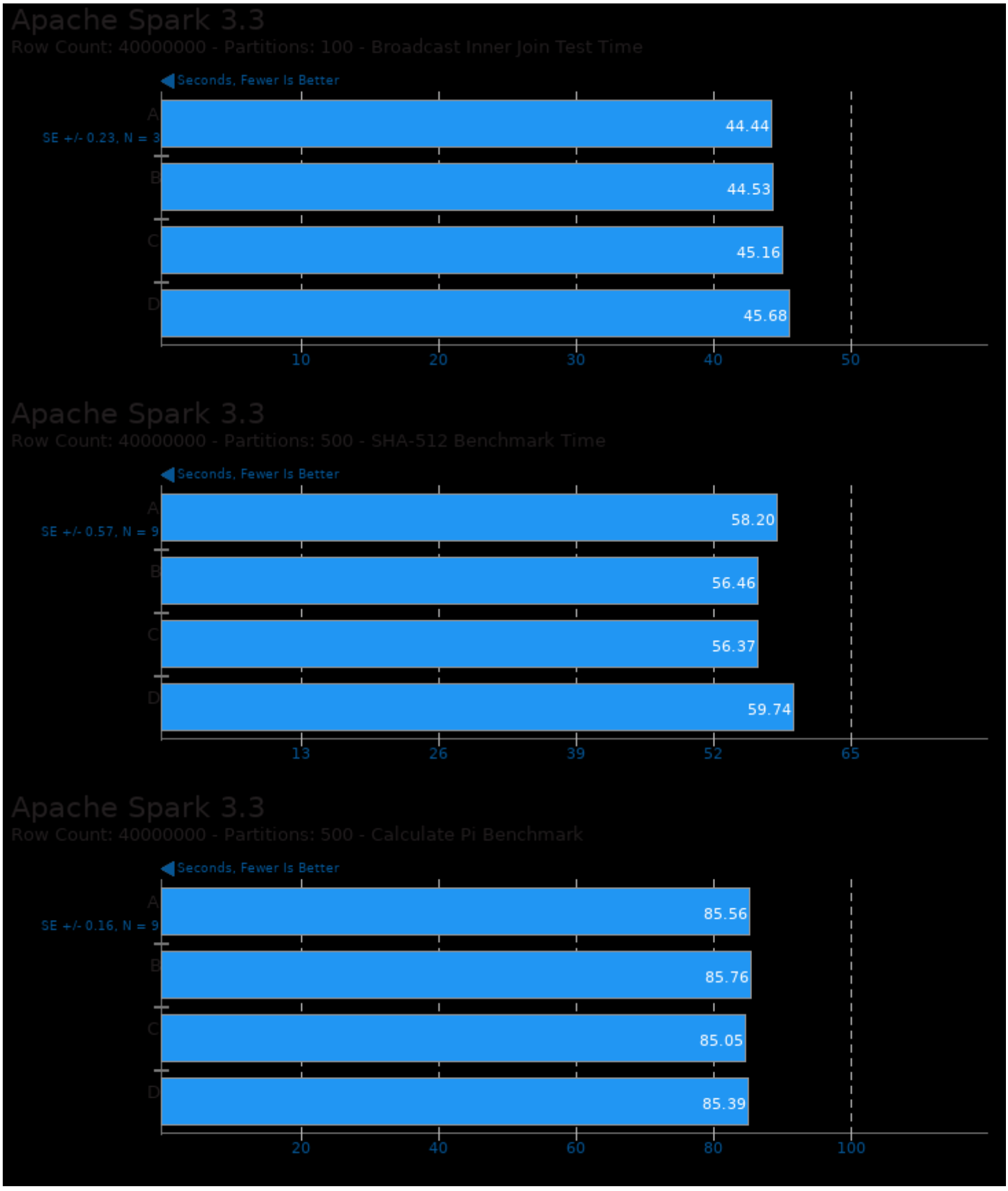

Apache Spark 3.3
Row Count: 20000000 - Partitions: 100 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.43, N = 3
A
23.41
B
23.79
C
24.11
D
23.04
6
12
18
24
30
Apache Spark 3.3
Row Count: 20000000 - Partitions: 100 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.13, N = 3
A
22.50
B
23.60
C
22.88
D
23.00
6
12
18
24
30
Apache Spark 3.3
Row Count: 20000000 - Partitions: 500 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.06, N = 3
A
29.76
B
29.75
C
29.79
D
29.47
7
14
21
28
35

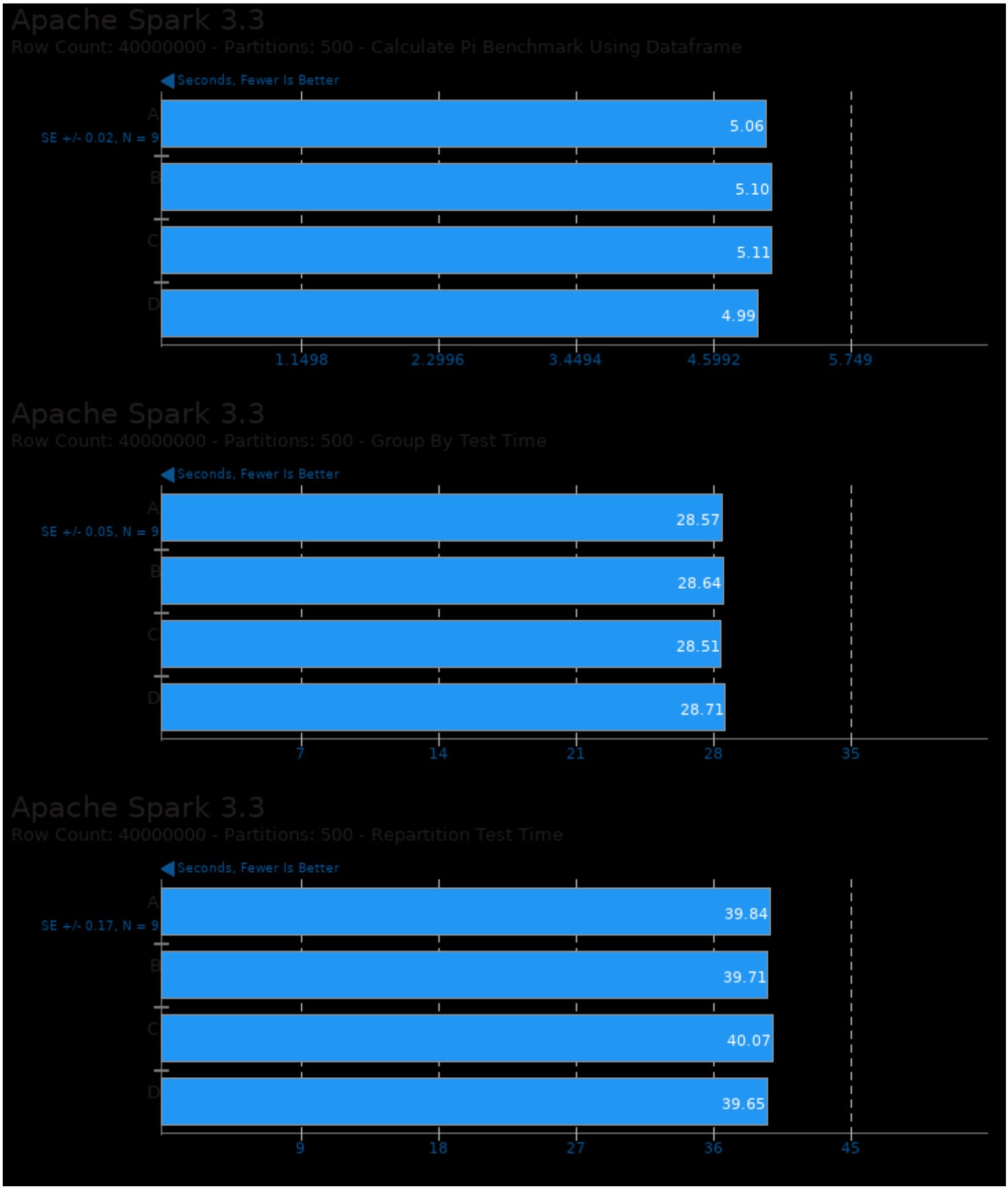

Apache Spark 3.3
Row Count: 20000000 - Partitions: 500 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.15, N = 3
A
85.63
B
84.91
C
87.04
D
85.91
20
40
60
80
100
Apache Spark 3.3
Row Count: 20000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
5.06
B
5.10
C
5.06
D
5.08
1.1475
2.295
3.4425
4.59
5.7375
Apache Spark 3.3
Row Count: 20000000 - Partitions: 500 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.08, N = 3
A
9.71
B
9.83
C
9.75
D
9.67
3
6
9
12
15

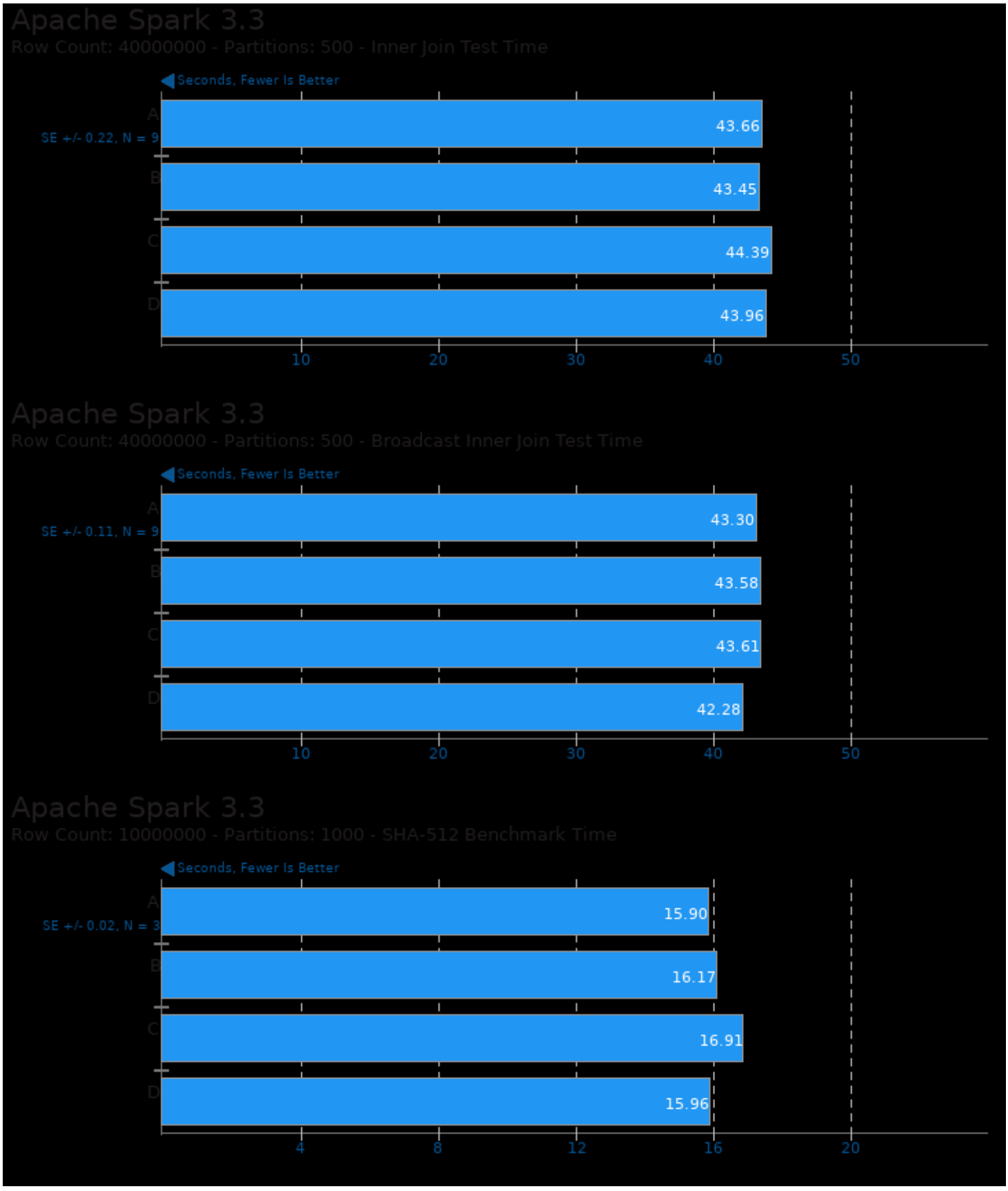

Apache Spark 3.3
Row Count: 20000000 - Partitions: 500 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 3
A
20.00
B
19.75
C
19.44
D
20.18
5
10
15
20
25
Apache Spark 3.3
Row Count: 20000000 - Partitions: 500 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.14, N = 3
A
22.57
B
22.14
C
21.40
D
22.29
5
10
15
20
25
Apache Spark 3.3
Row Count: 20000000 - Partitions: 500 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.20, N = 3
A
21.69
B
21.68
C
21.22
D
21.67
5
10
15
20
25

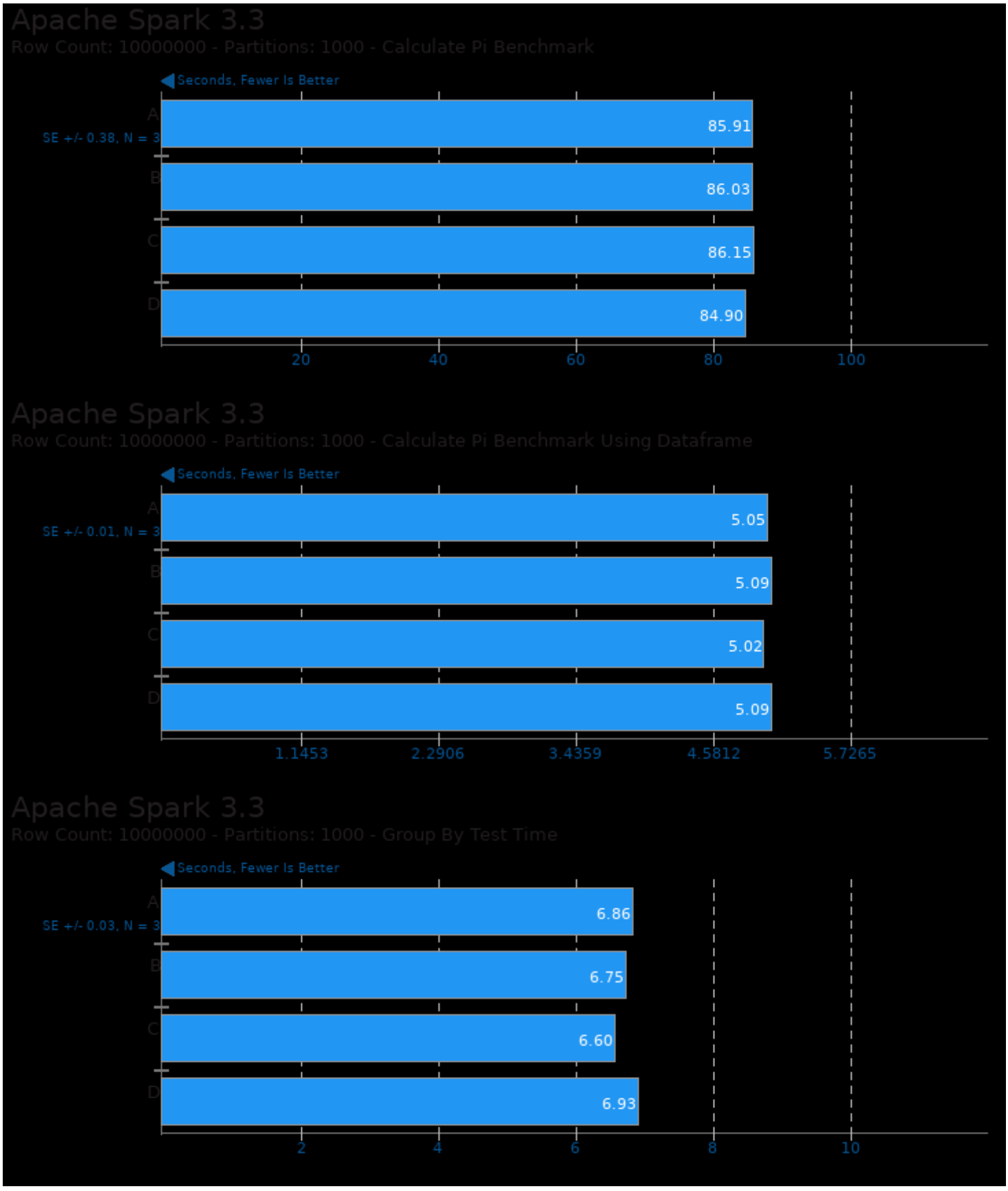

Apache Spark 3.3
Row Count: 40000000 - Partitions: 100 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.76, N = 3
A
60.77
B
61.57
C
59.39
D
59.42
14
28
42
56
70
Apache Spark 3.3
Row Count: 40000000 - Partitions: 100 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.98, N = 3
A
86.18
B
85.78
C
85.10
D
85.36
20
40
60
80
100
Apache Spark 3.3
Row Count: 40000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.03, N = 3
A
5.05
B
5.10
C
5.02
D
5.08
1.1475
2.295
3.4425
4.59
5.7375

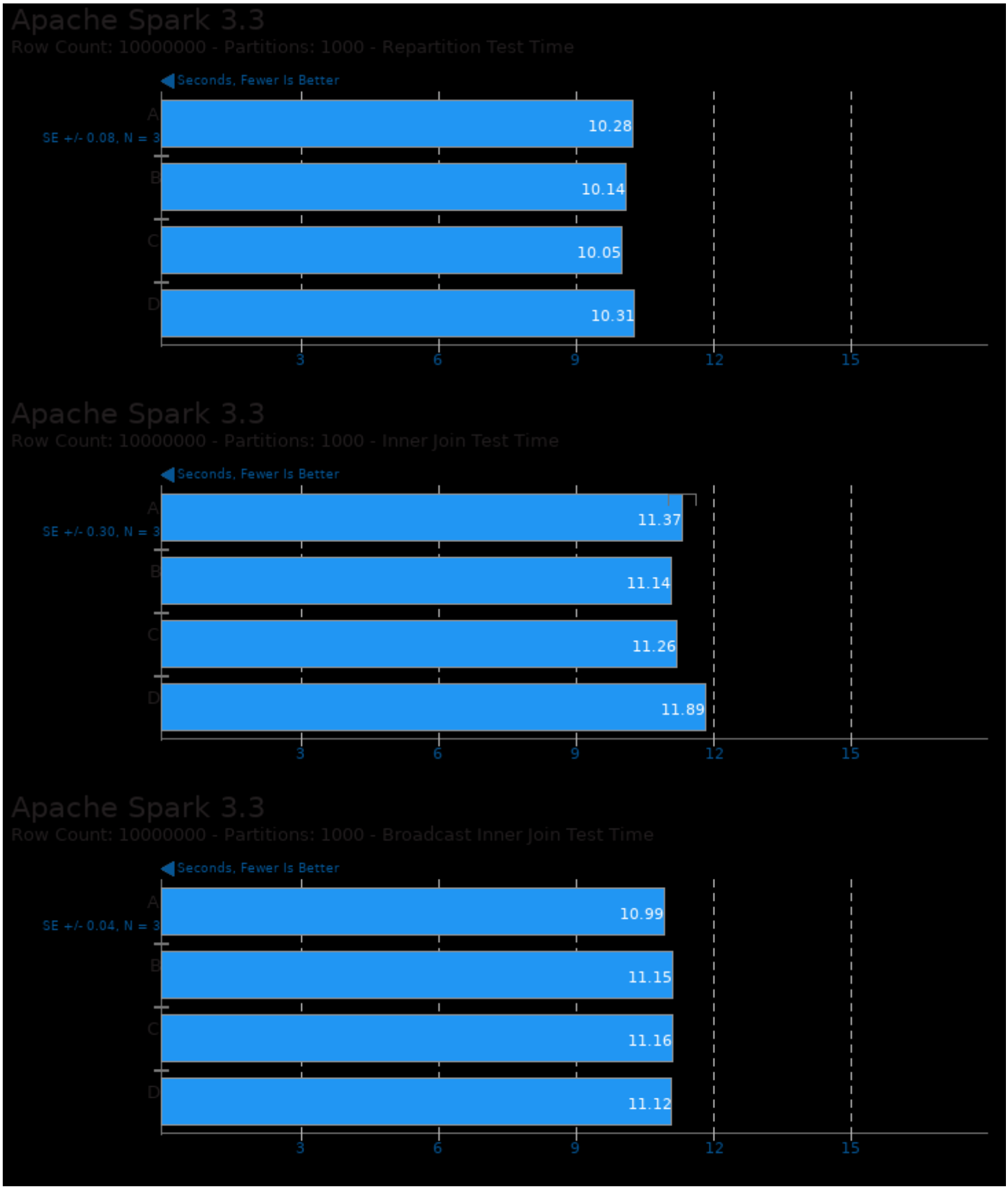

Apache Spark 3.3
Row Count: 40000000 - Partitions: 100 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.11, N = 3
A
30.24
B
30.29
C
30.38
D
30.77
7
14
21
28
35
Apache Spark 3.3
Row Count: 40000000 - Partitions: 100 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.12, N = 3
A
41.09
B
40.89
C
40.57
D
40.93
9
18
27
36
45
Apache Spark 3.3
Row Count: 40000000 - Partitions: 100 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.21, N = 3
A
45.17
B
46.00
C
44.64
D
45.77
10
20
30
40
50

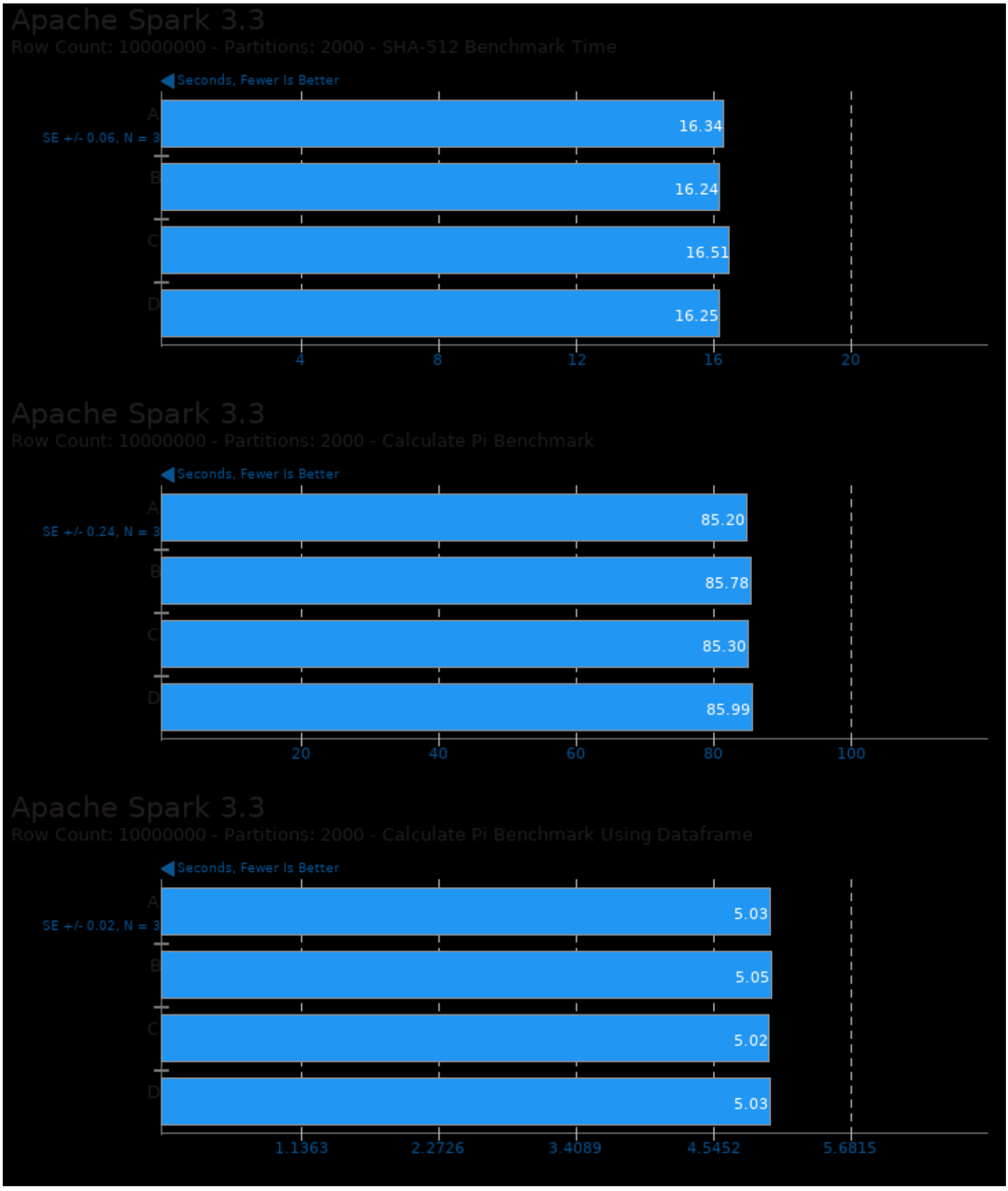

Apache Spark 3.3
Row Count: 40000000 - Partitions: 100 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.23, N = 3
A
B
C
D
44.44
44.53
45.16
45.68
10
20
30
40
50
Apache Spark 3.3
Row Count: 40000000 - Partitions: 500 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.57, N = 9
A
B
C
D
58.20
56.46
56.37
59.74
13
26
39
52
65
Apache Spark 3.3
Row Count: 40000000 - Partitions: 500 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.16, N = 9
A
B
C
D
85.56
85.76
85.05
85.39
20
40
60
80
100

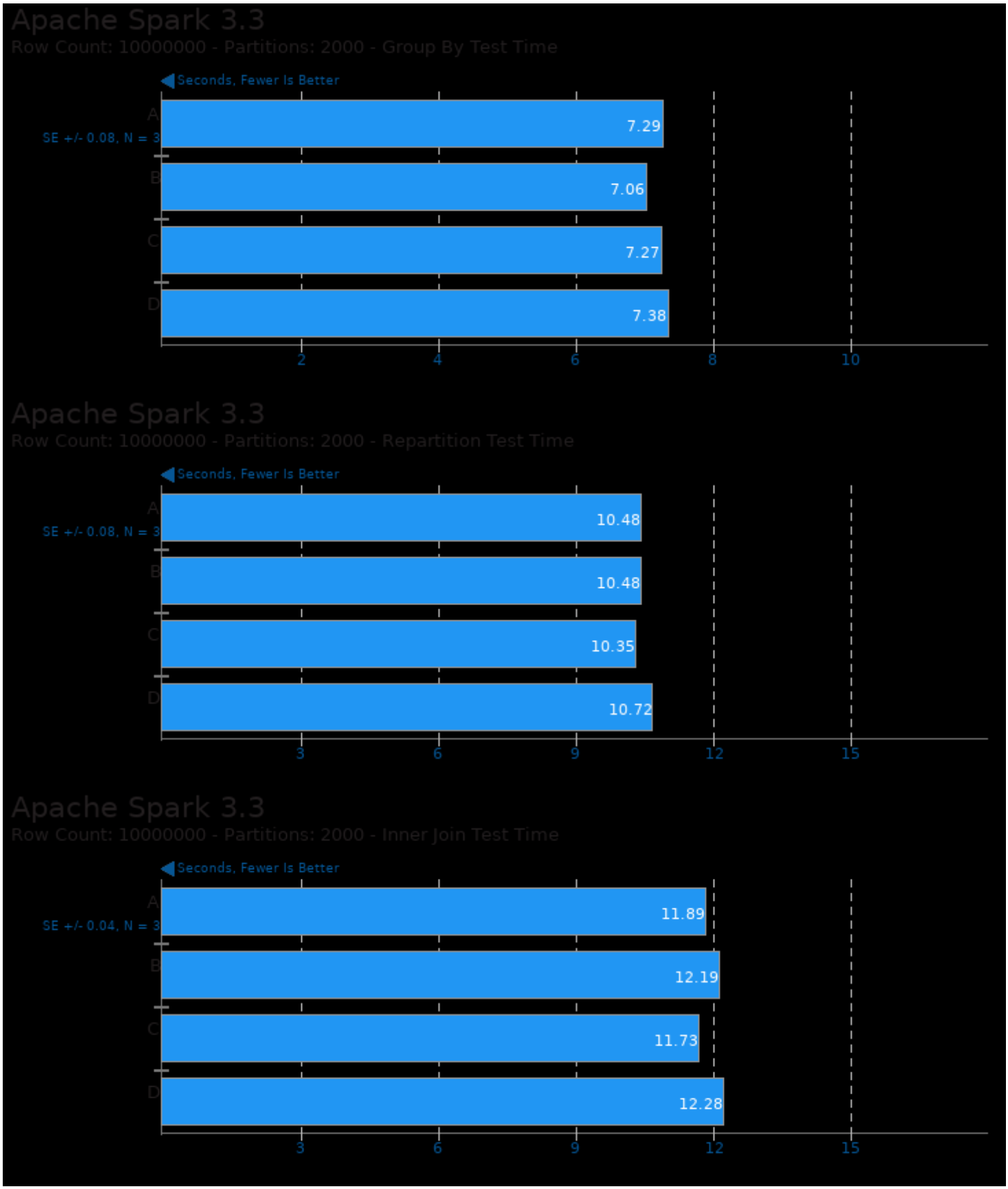

Apache Spark 3.3
Row Count: 40000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.02, N = 9
A
5.06
B
5.10
C
5.11
D
4.99
1.1498
2.2996
3.4494
4.5992
5.749
Apache Spark 3.3
Row Count: 40000000 - Partitions: 500 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.05, N = 9
A
28.57
B
28.64
C
28.51
D
28.71
7
14
21
28
35
Apache Spark 3.3
Row Count: 40000000 - Partitions: 500 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.17, N = 9
A
39.84
B
39.71
C
40.07
D
39.65
9
18
27
36
45

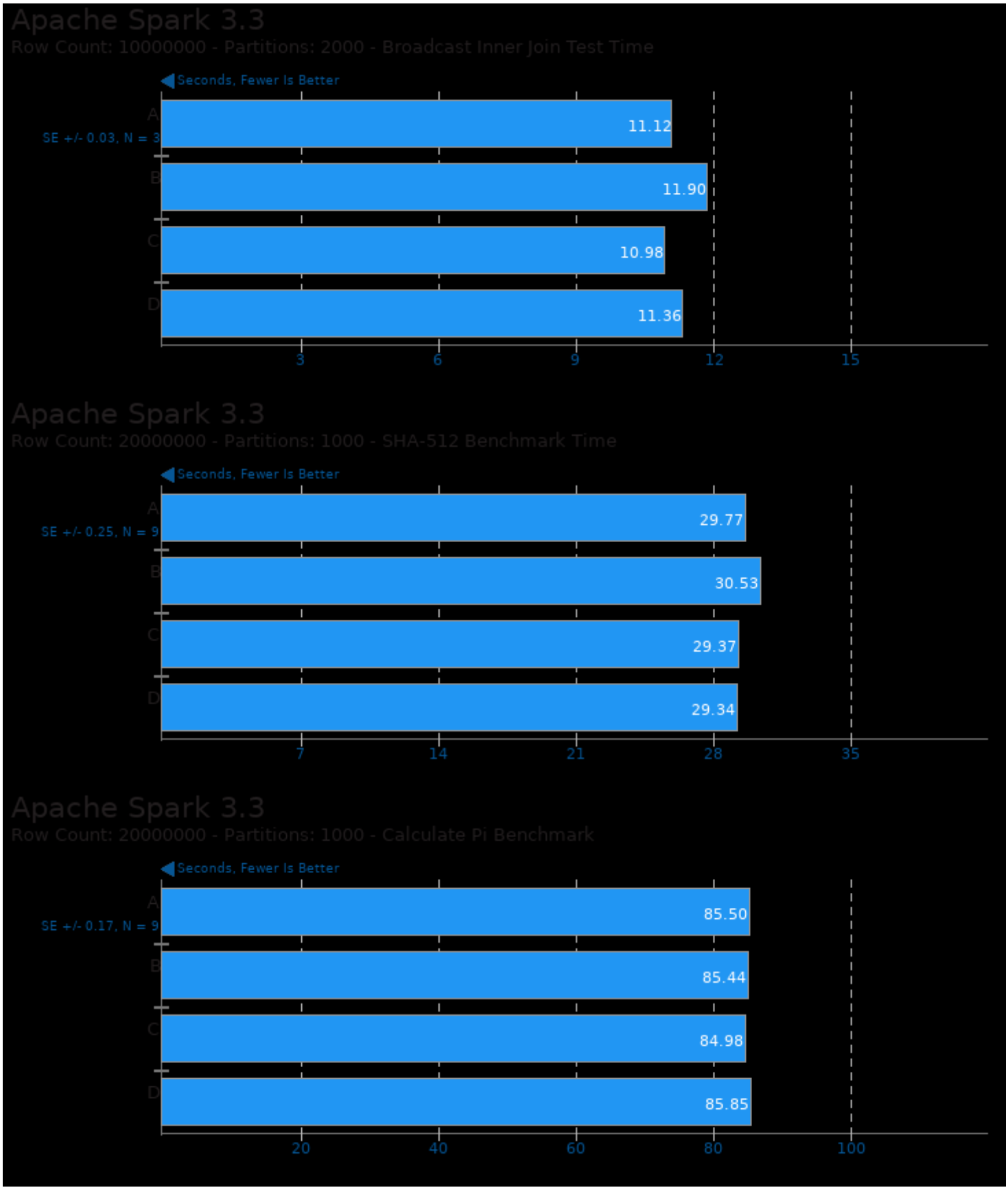

Apache Spark 3.3
Row Count: 40000000 - Partitions: 500 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.22, N = 9
A
B
C
D
43.66
43.45
44.39
43.96
10
20
30
40
50
Apache Spark 3.3
Row Count: 40000000 - Partitions: 500 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.11, N = 9
A
B
C
D
43.30
43.58
43.61
42.28
10
20
30
40
50
Apache Spark 3.3
Row Count: 10000000 - Partitions: 1000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
A
B
C
D
15.90
16.17
16.91
15.96
4
8
12
16
20

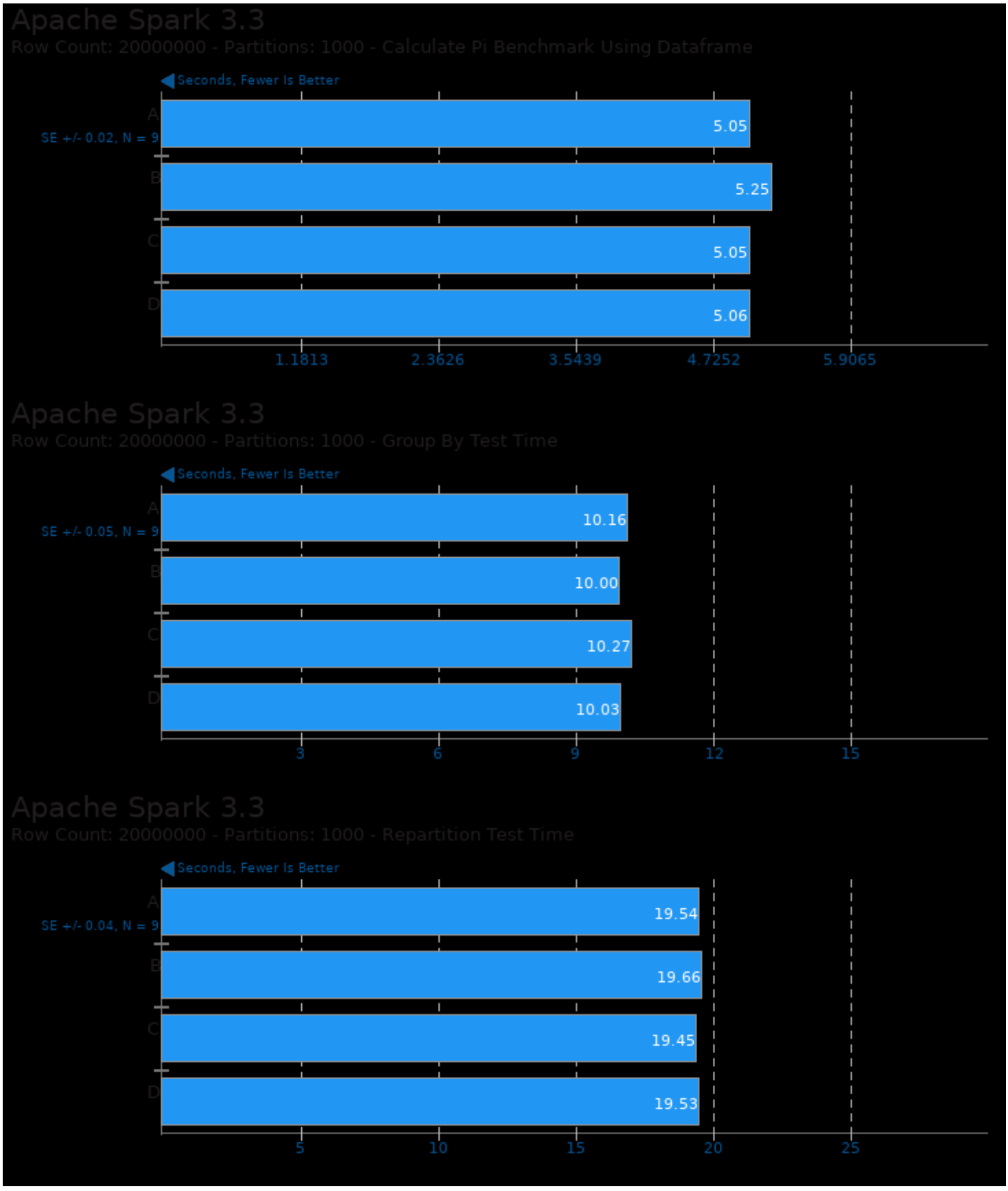

Apache Spark 3.3
Row Count: 10000000 - Partitions: 1000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.38, N = 3
A
B
C
D
85.91
86.03
86.15
84.90
20
40
60
80
100
Apache Spark 3.3
Row Count: 10000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 3
A
B
C
D
5.05
5.09
5.02
5.09
1.1453
2.2906
3.4359
4.5812
5.7265
Apache Spark 3.3
Row Count: 10000000 - Partitions: 1000 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.03, N = 3
A
B
C
D
6.86
6.75
6.60
6.93
2
4
6
8
10

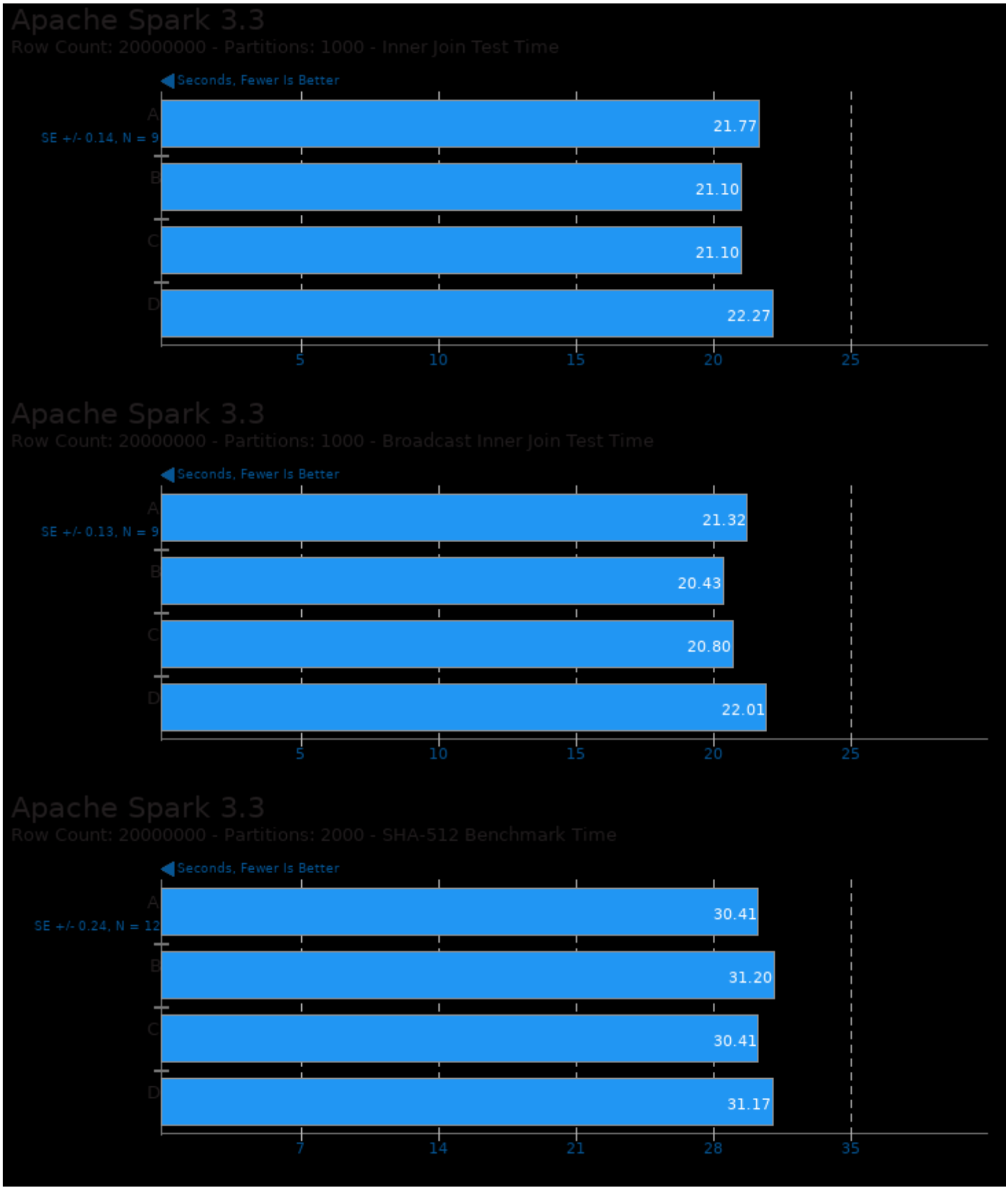

Apache Spark 3.3
Row Count: 10000000 - Partitions: 1000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.08, N = 3
A
10.28
B
10.14
C
10.05
D
10.31
3
6
9
12
15
Apache Spark 3.3
Row Count: 10000000 - Partitions: 1000 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.30, N = 3
A
11.37
B
11.14
C
11.26
D
11.89
3
6
9
12
15
Apache Spark 3.3
Row Count: 10000000 - Partitions: 1000 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 3
A
10.99
B
11.15
C
11.16
D
11.12
3
6
9
12
15

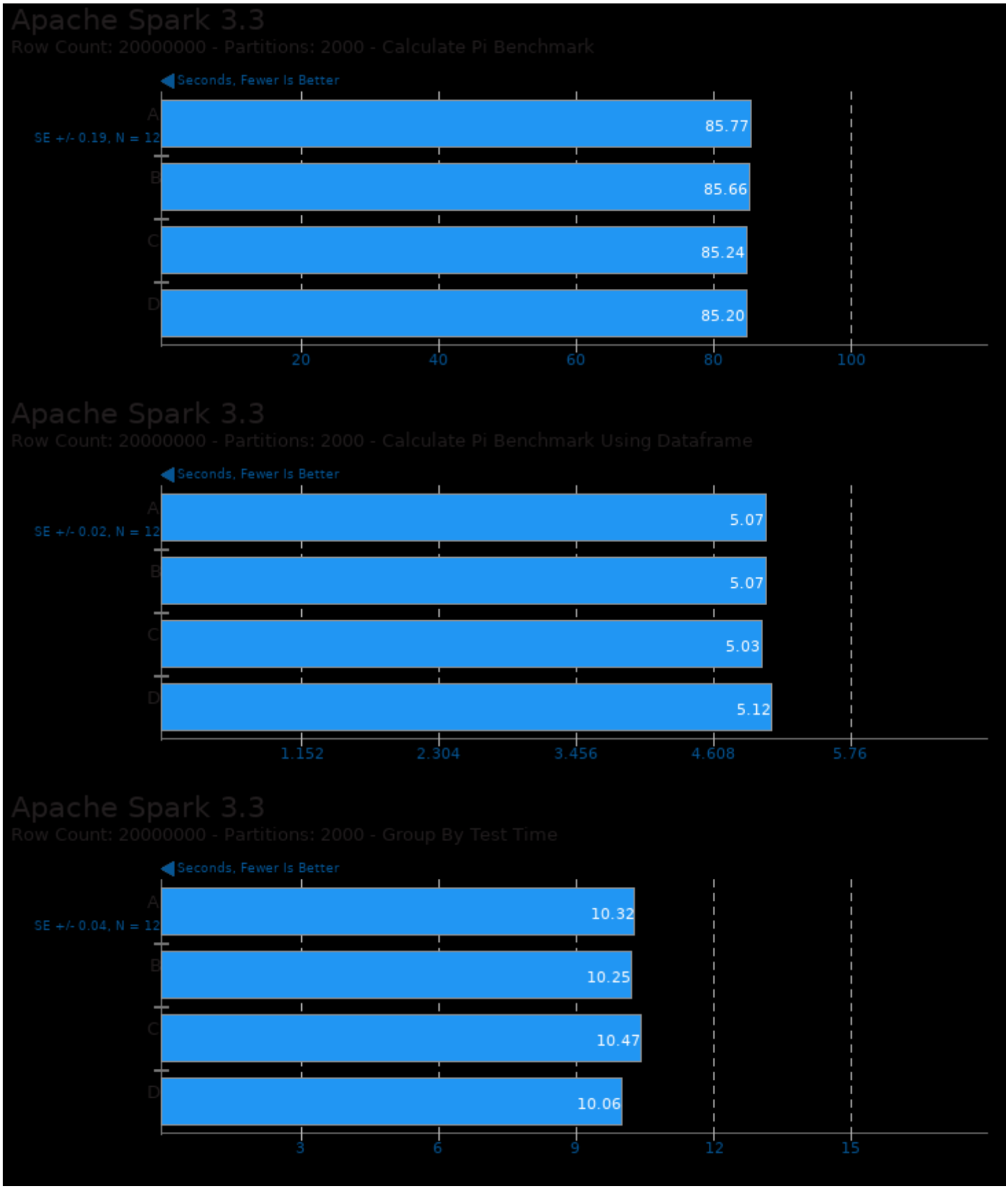

Apache Spark 3.3
Row Count: 10000000 - Partitions: 2000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.06, N = 3
A
16.34
B
16.24
C
16.51
D
16.25
4
8
12
16
20
Apache Spark 3.3
Row Count: 10000000 - Partitions: 2000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.24, N = 3
A
85.20
B
85.78
C
85.30
D
85.99
20
40
60
80
100
Apache Spark 3.3
Row Count: 10000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.02, N = 3
A
5.03
B
5.05
C
5.02
D
5.03
1.1363
2.2726
3.4089
4.5452
5.6815

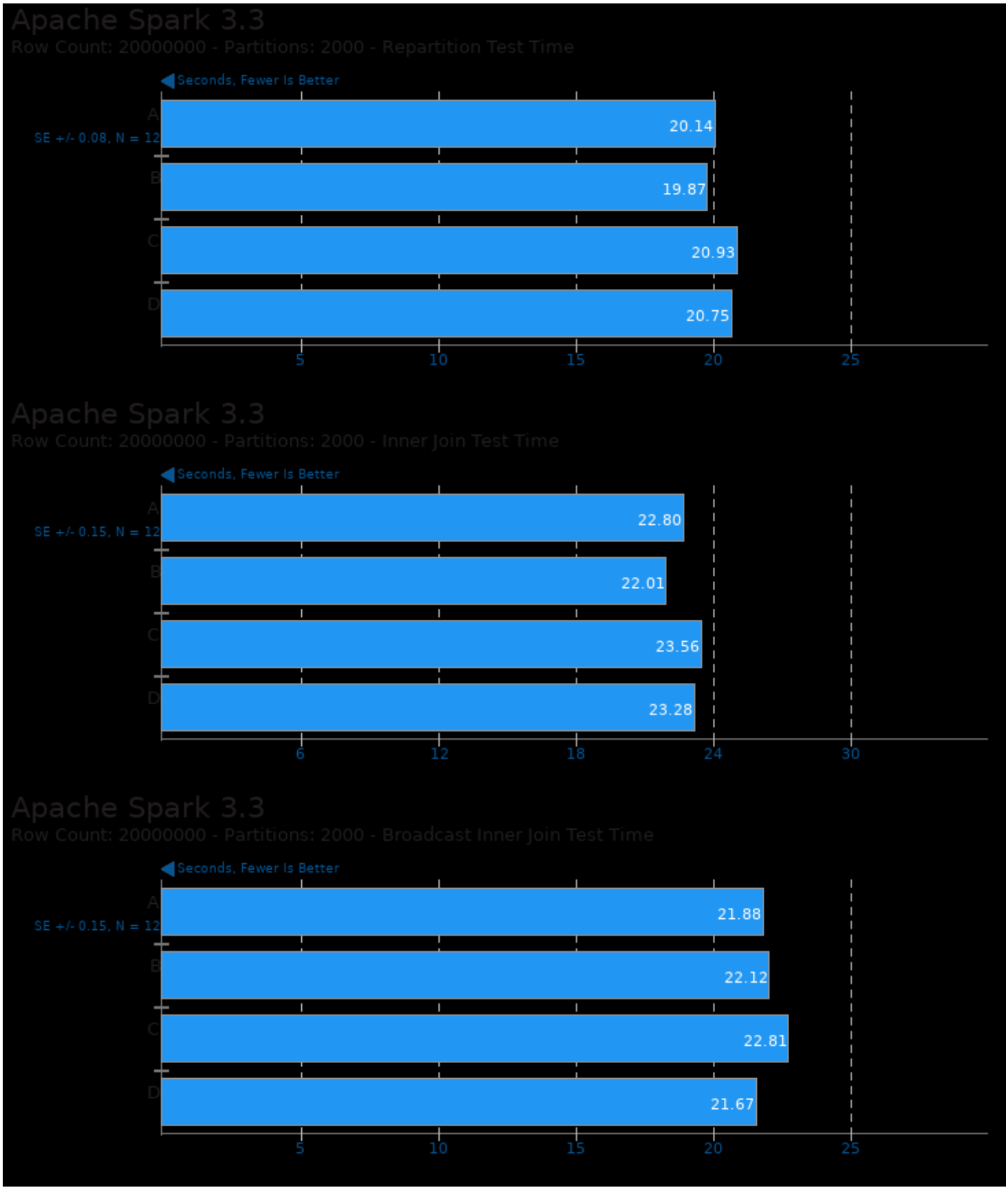

Apache Spark 3.3
Row Count: 10000000 - Partitions: 2000 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.08, N = 3
A
7.29
B
7.06
C
7.27
D
7.38
2
4
6
8
10
Apache Spark 3.3
Row Count: 10000000 - Partitions: 2000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.08, N = 3
A
10.48
B
10.48
C
10.35
D
10.72
3
6
9
12
15
Apache Spark 3.3
Row Count: 10000000 - Partitions: 2000 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 3
A
11.89
B
12.19
C
11.73
D
12.28
3
6
9
12
15

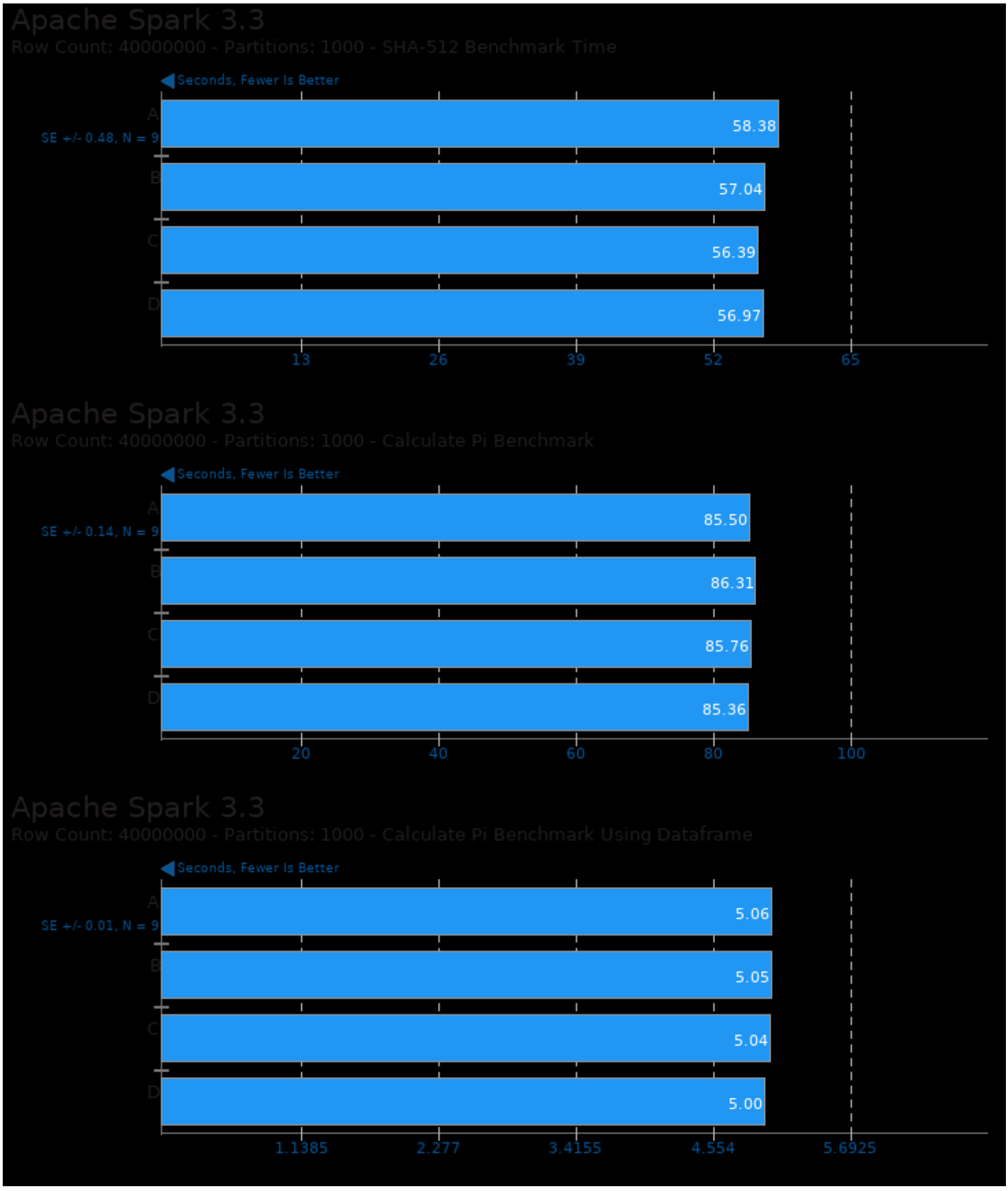

Apache Spark 3.3
Row Count: 10000000 - Partitions: 2000 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.03, N = 3
A
11.12
B
11.90
C
10.98
D
11.36
3
6
9
12
15
Apache Spark 3.3
Row Count: 20000000 - Partitions: 1000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.25, N = 9
A
29.77
B
30.53
C
29.37
D
29.34
7
14
21
28
35
Apache Spark 3.3
Row Count: 20000000 - Partitions: 1000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.17, N = 9
A
85.50
B
85.44
C
84.98
D
85.85
20
40
60
80
100

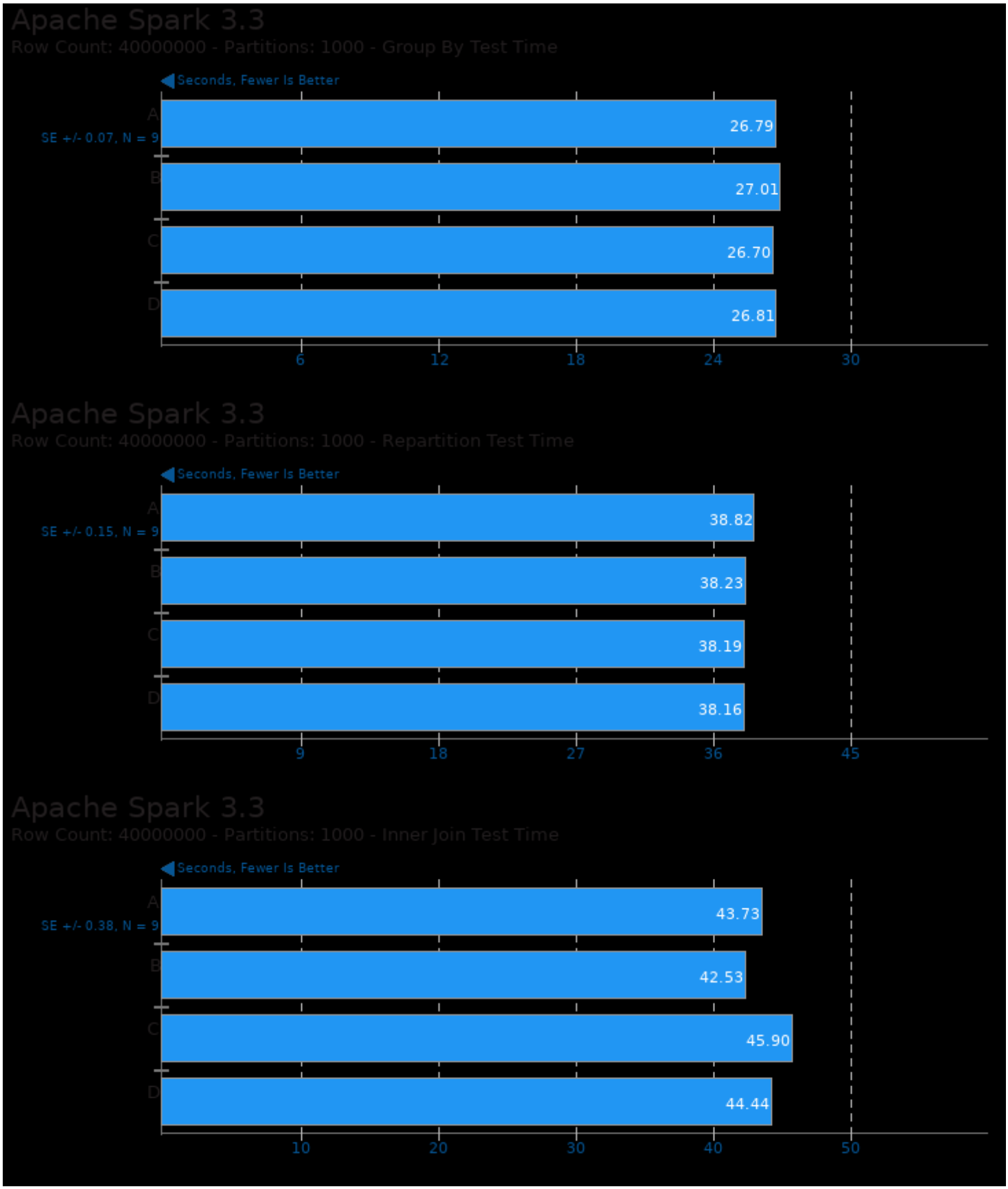

Apache Spark 3.3
Row Count: 20000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.02, N = 9
A
5.05
B
5.25
C
5.05
D
5.06
1.1813
2.3626
3.5439
4.7252
5.9065
Apache Spark 3.3
Row Count: 20000000 - Partitions: 1000 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.05, N = 9
A
10.16
B
10.00
C
10.27
D
10.03
3
6
9
12
15
Apache Spark 3.3
Row Count: 20000000 - Partitions: 1000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 9
A
19.54
B
19.66
C
19.45
D
19.53
5
10
15
20
25

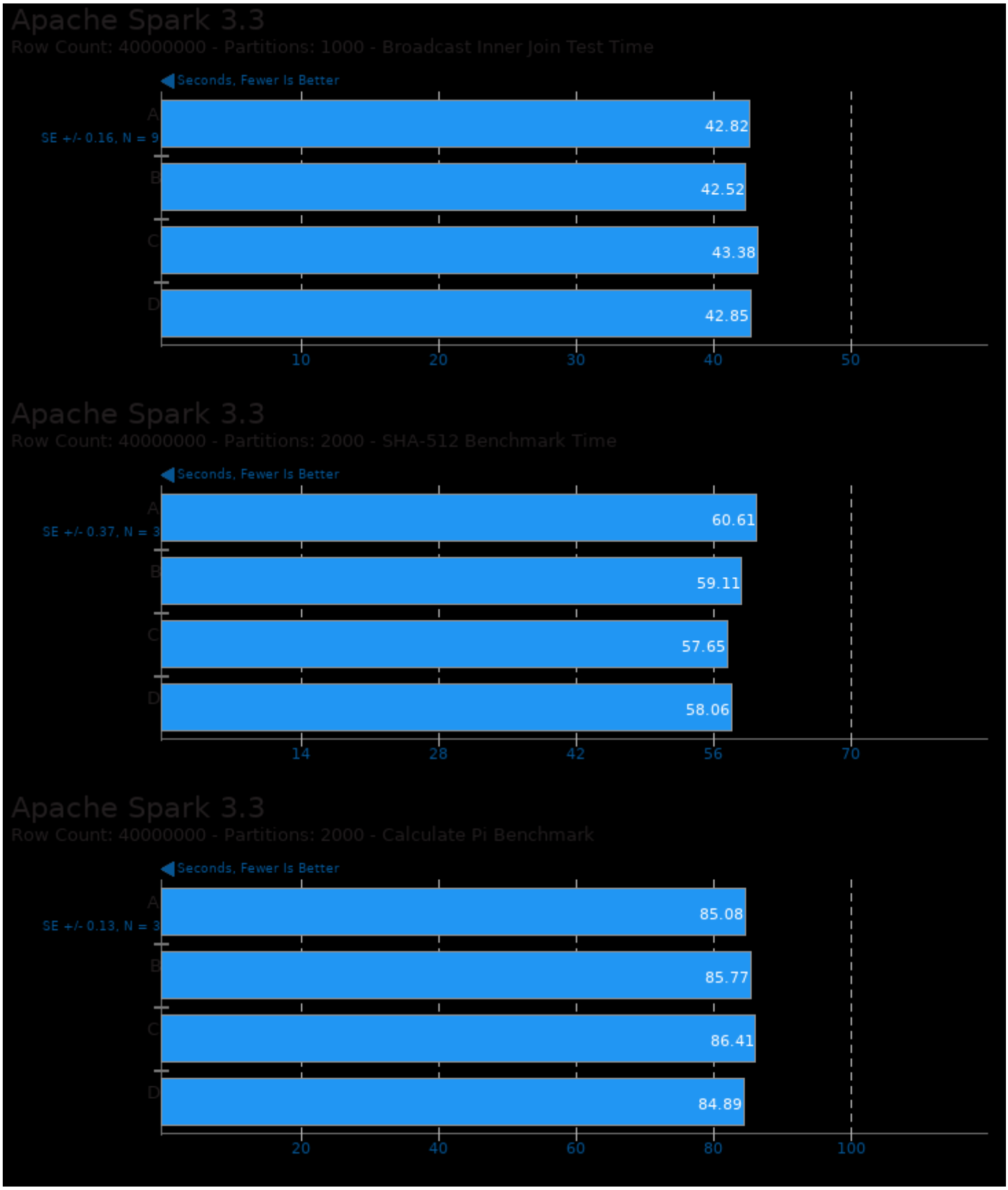

Apache Spark 3.3
Row Count: 20000000 - Partitions: 1000 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.14, N = 9
A
21.77
B
21.10
C
21.10
D
22.27
5
10
15
20
25
Apache Spark 3.3
Row Count: 20000000 - Partitions: 1000 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.13, N = 9
A
21.32
B
20.43
C
20.80
D
22.01
5
10
15
20
25
Apache Spark 3.3
Row Count: 20000000 - Partitions: 2000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.24, N = 12
A
30.41
B
31.20
C
30.41
D
31.17
7
14
21
28
35

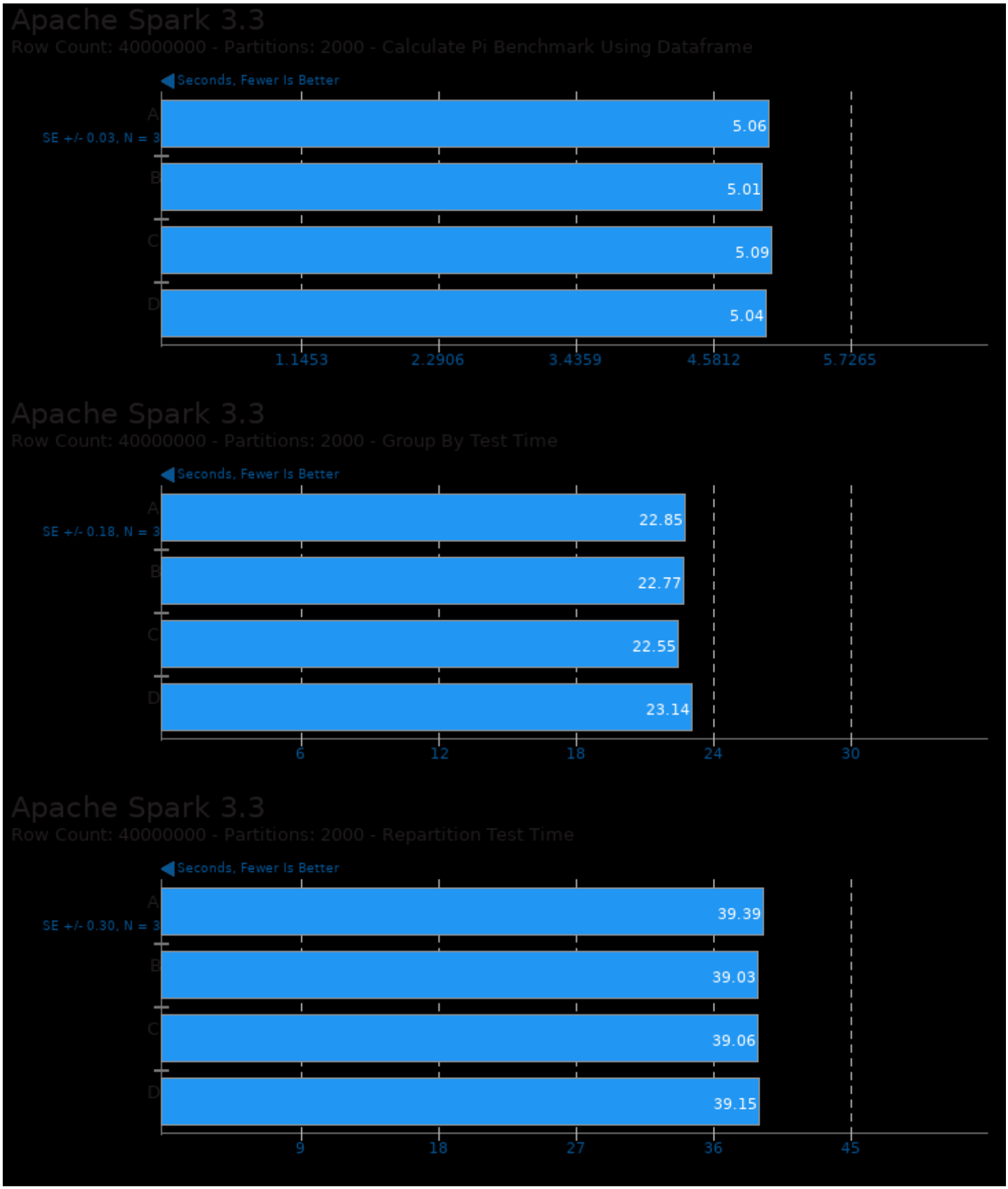

Apache Spark 3.3
Row Count: 20000000 - Partitions: 2000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.19, N = 12
A
B
C
D
85.77
85.66
85.24
85.20
20
40
60
80
100
Apache Spark 3.3
Row Count: 20000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.02, N = 12
A
B
C
D
5.07
5.07
5.03
5.12
1.152
2.304
3.456
4.608
5.76
Apache Spark 3.3
Row Count: 20000000 - Partitions: 2000 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.04, N = 12
A
B
C
D
10.32
10.25
10.47
10.06
3
6
9
12
15


Apache Spark 3.3
Row Count: 20000000 - Partitions: 2000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.08, N = 12
A
20.14
B
19.87
C
20.93
D
20.75
5
10
15
20
25
Apache Spark 3.3
Row Count: 20000000 - Partitions: 2000 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.15, N = 12
A
22.80
B
22.01
C
23.56
D
23.28
6
12
18
24
30
Apache Spark 3.3
Row Count: 20000000 - Partitions: 2000 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.15, N = 12
A
21.88
B
22.12
C
22.81
D
21.67
5
10
15
20
25


Apache Spark 3.3
Row Count: 40000000 - Partitions: 1000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.48, N = 9
A
58.38
B
57.04
C
56.39
D
56.97
13
26
39
52
65
Apache Spark 3.3
Row Count: 40000000 - Partitions: 1000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.14, N = 9
A
85.50
B
86.31
C
85.76
D
85.36
20
40
60
80
100
Apache Spark 3.3
Row Count: 40000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.01, N = 9
A
5.06
B
5.05
C
5.04
D
5.00
1.1385
2.277
3.4155
4.554
5.6925

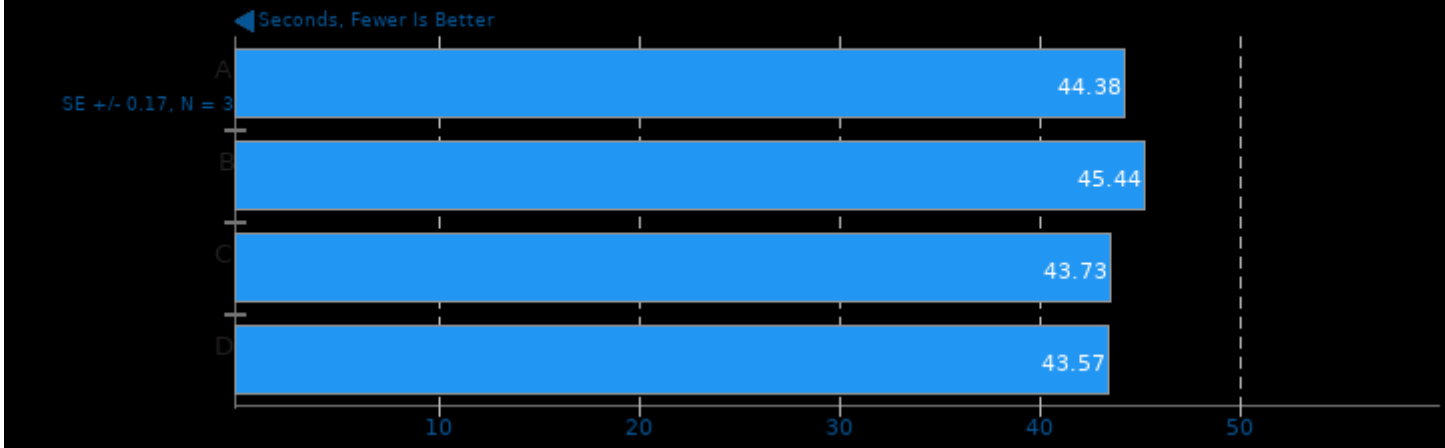

Apache Spark 3.3
Row Count: 40000000 - Partitions: 1000 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.07, N = 9
A
26.79
B
27.01
C
26.70
D
26.81
6
12
18
24
30
Apache Spark 3.3
Row Count: 40000000 - Partitions: 1000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.15, N = 9
A
38.82
B
38.23
C
38.19
D
38.16
9
18
27
36
45
Apache Spark 3.3
Row Count: 40000000 - Partitions: 1000 - Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.38, N = 9
A
43.73
B
42.53
C
45.90
D
44.44
10
20
30
40
50


Apache Spark 3.3
Row Count: 40000000 - Partitions: 1000 - Broadcast Inner Join Test Time
Seconds, Fewer Is Better
SE +/- 0.16, N = 9
A
42.82
B
42.52
C
43.38
D
42.85
10
20
30
40
50
Apache Spark 3.3
Row Count: 40000000 - Partitions: 2000 - SHA-512 Benchmark Time
Seconds, Fewer Is Better
SE +/- 0.37, N = 3
A
60.61
B
59.11
C
57.65
D
58.06
14
28
42
56
70
Apache Spark 3.3
Row Count: 40000000 - Partitions: 2000 - Calculate Pi Benchmark
Seconds, Fewer Is Better
SE +/- 0.13, N = 3
A
85.08
B
85.77
C
86.41
D
84.89
20
40
60
80
100


Apache Spark 3.3
Row Count: 40000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe
Seconds, Fewer Is Better
SE +/- 0.03, N = 3
A
5.06
B
5.01
C
5.09
D
5.04
1.1453
2.2906
3.4359
4.5812
5.7265
Apache Spark 3.3
Row Count: 40000000 - Partitions: 2000 - Group By Test Time
Seconds, Fewer Is Better
SE +/- 0.18, N = 3
A
22.85
B
22.77
C
22.55
D
23.14
6
12
18
24
30
Apache Spark 3.3
Row Count: 40000000 - Partitions: 2000 - Repartition Test Time
Seconds, Fewer Is Better
SE +/- 0.30, N = 3
A
39.39
B
39.03
C
39.06
D
39.15
9
18
27
36
45

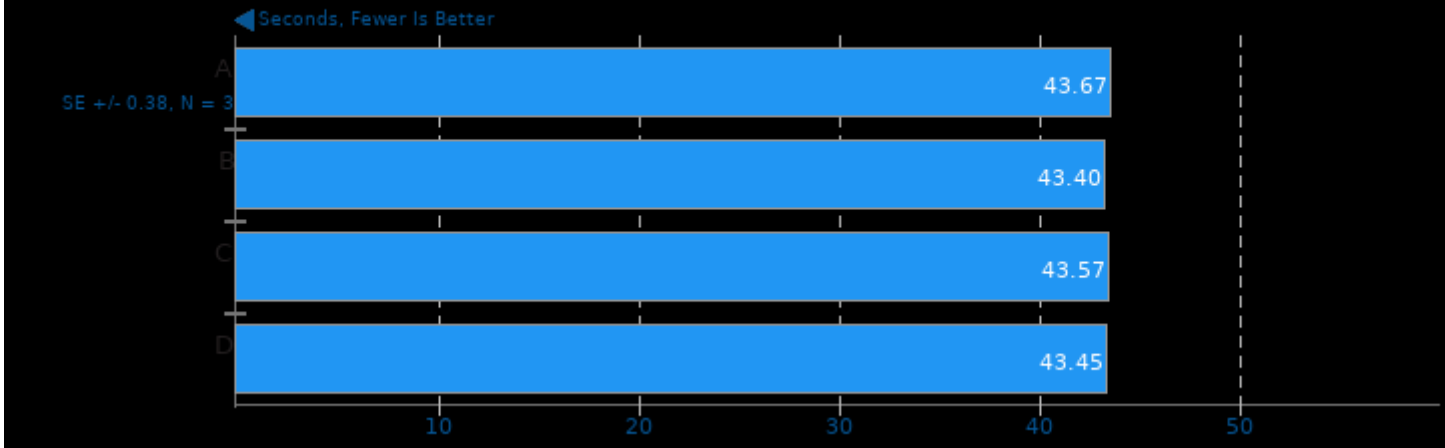
Apache Spark 3.3

Row Count: 40000000 - Partitions: 2000 - Inner Join Test Time



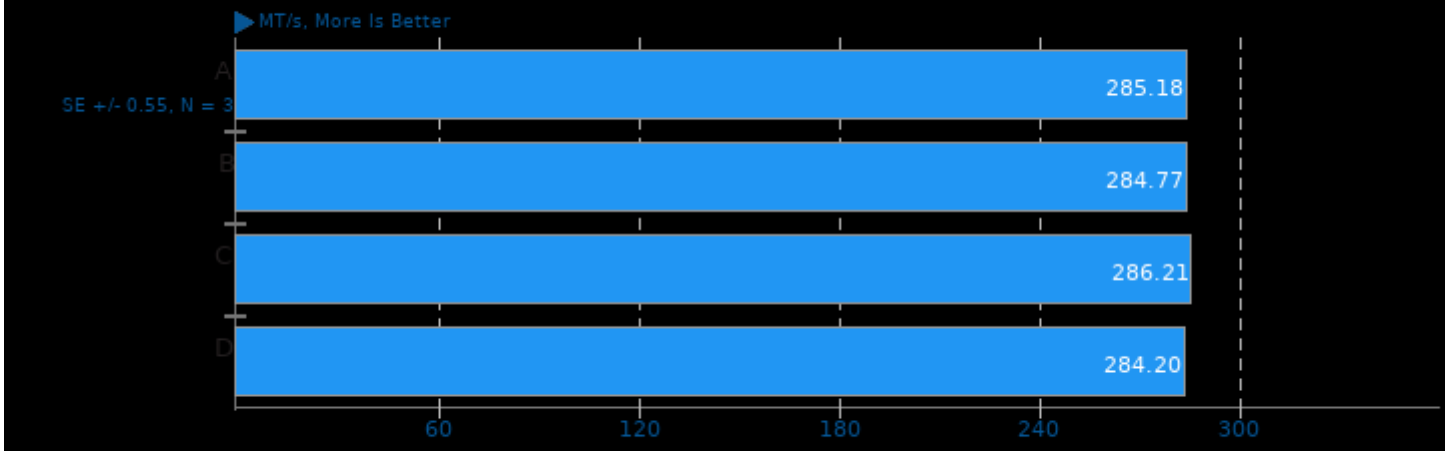
Apache Spark 3.3

Row Count: 40000000 - Partitions: 2000 - Broadcast Inner Join Test Time

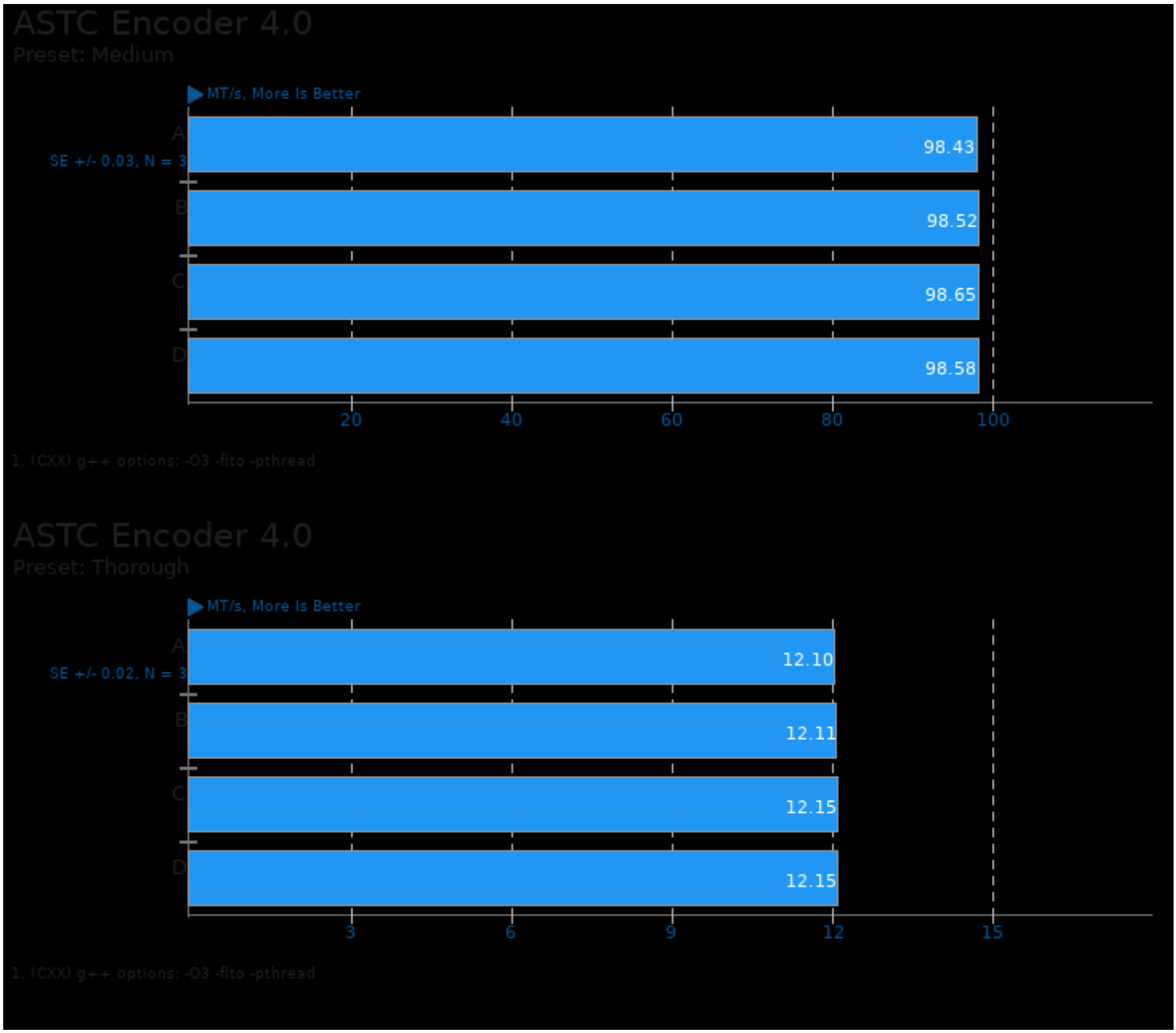


ASTC Encoder 4.0

Preset: Fast

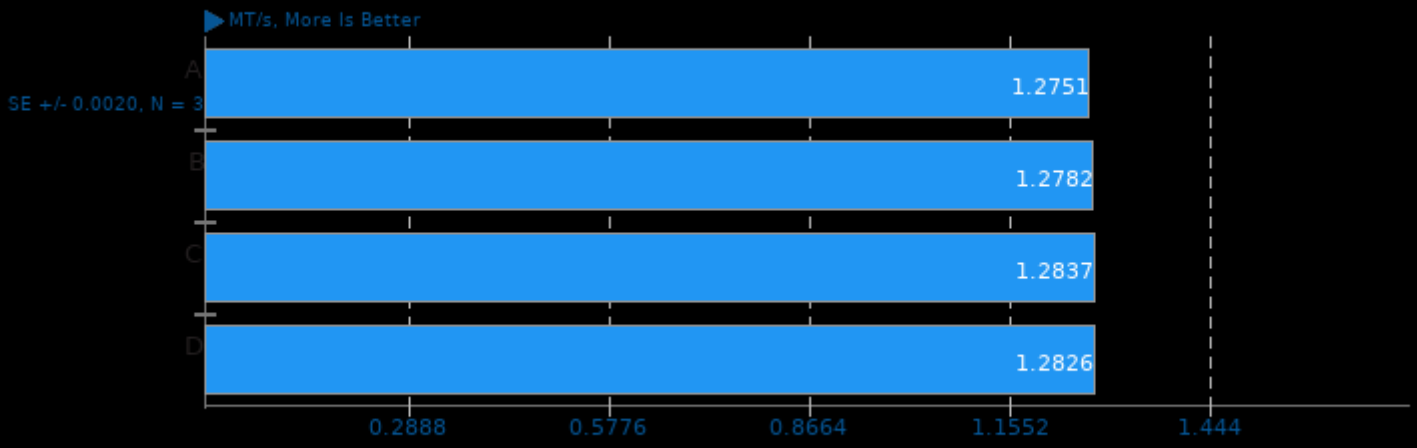


1. (CXX) g++ options: -O3 -flto -pthread


ASTC Encoder 4.0
Preset: Medium
MT/s, More Is Better
SE +/- 0.03, N = 3
A
B
C
D
98.43
98.52
98.65
98.58
20
40
60
80
100
1. (CXX) g++ options: -O3 -flto -pthread
ASTC Encoder 4.0
Preset: Thorough
MT/s, More Is Better
SE +/- 0.02, N = 3
A
B
C
D
12.10
12.11
12.15
12.15
3
6
9
12
15
1. (CXX) g++ options: -O3 -flto -pthread

ASTC Encoder 4.0

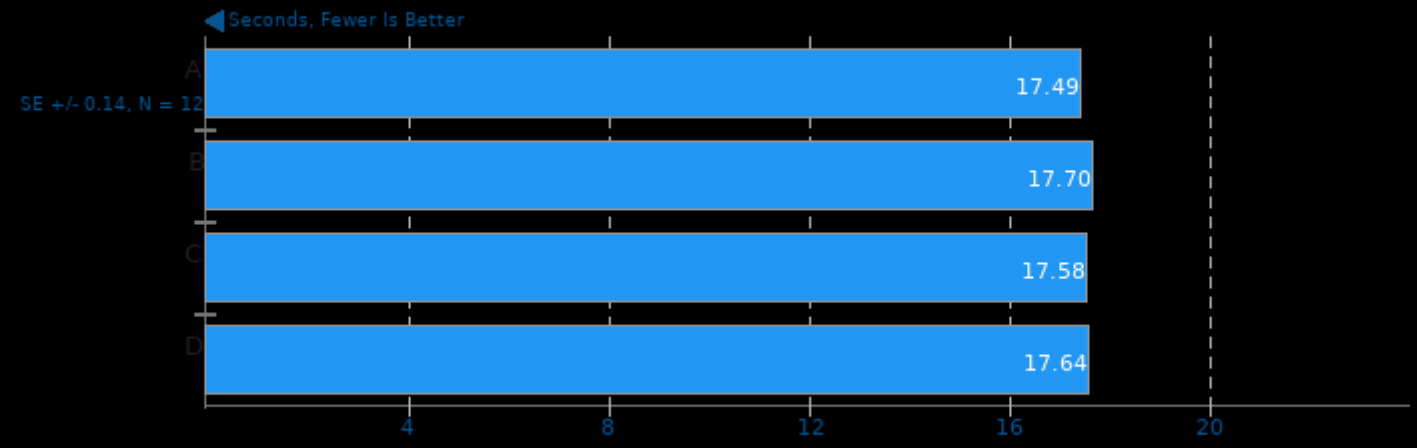
Preset: Exhaustive



1. (CXX) g++ options: -O3 -flto -pthread

Inkscape

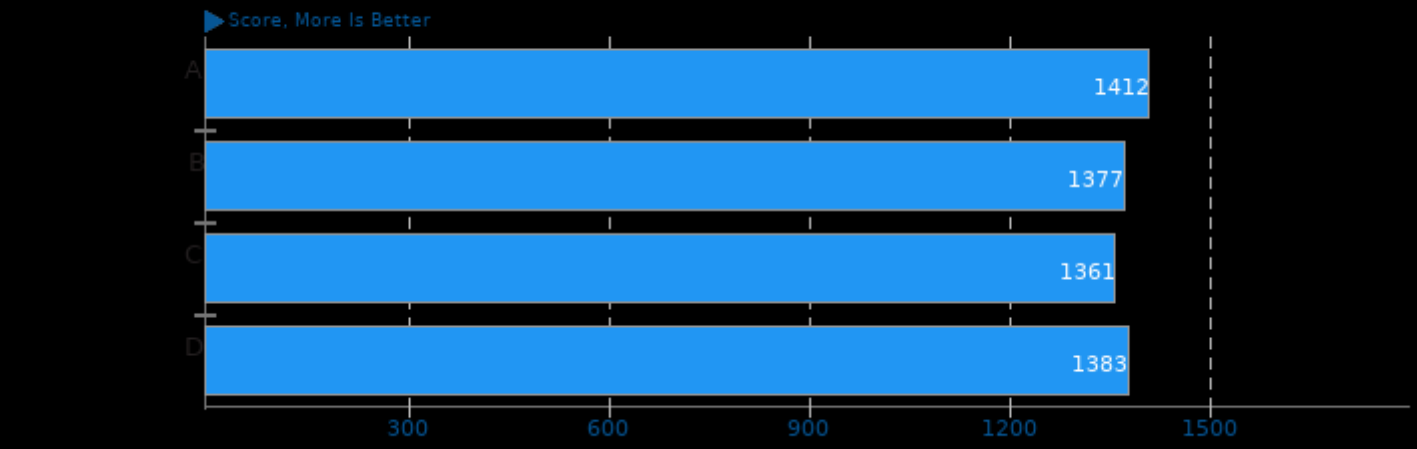
Operation: SVG Files To PNG

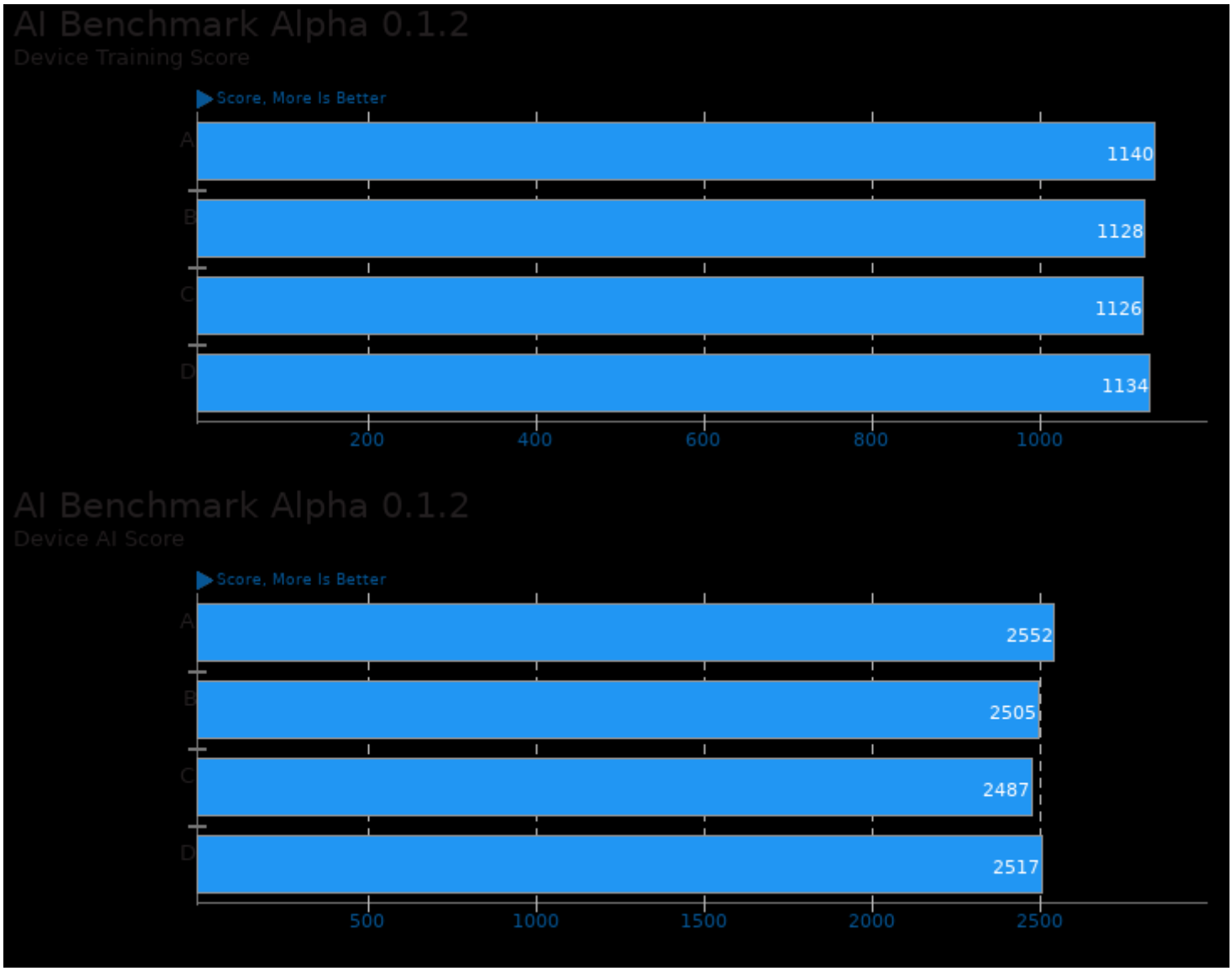


1. Inkscape 1.1.2 (0a00cf5339, 2022-02-04)

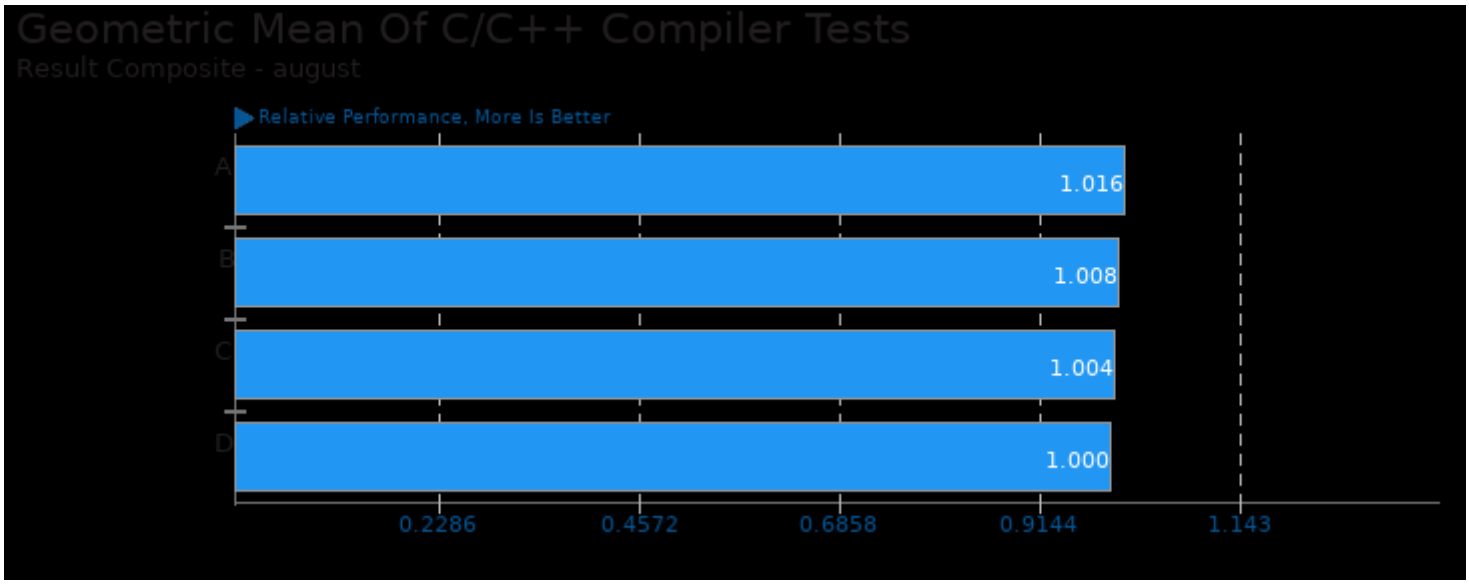
AI Benchmark Alpha 0.1.2

Device Inference Score

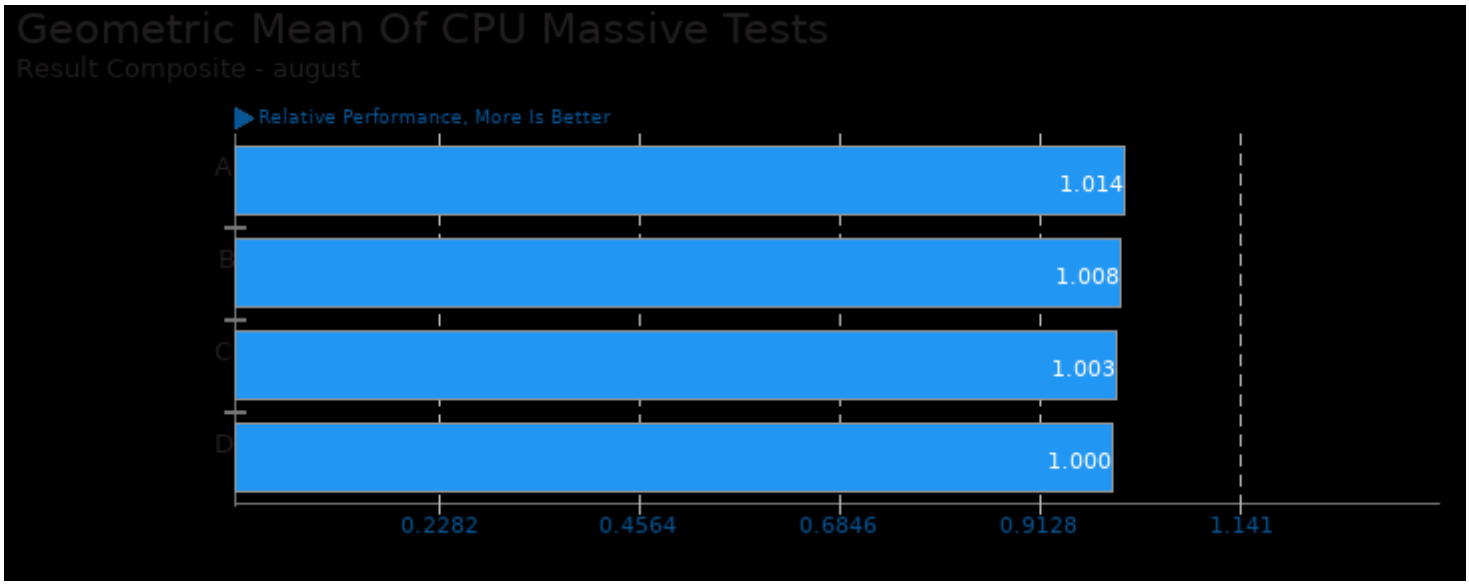



AI Benchmark Alpha 0.1.2
Device Training Score
Score, More Is Better
A
1140
B
1128
C
1126
D
1134
200
400
600
800
1000
AI Benchmark Alpha 0.1.2
Device AI Score
Score, More Is Better
A
2552
B
2505
C
2487
D
2517
500
1000
1500
2000
2500

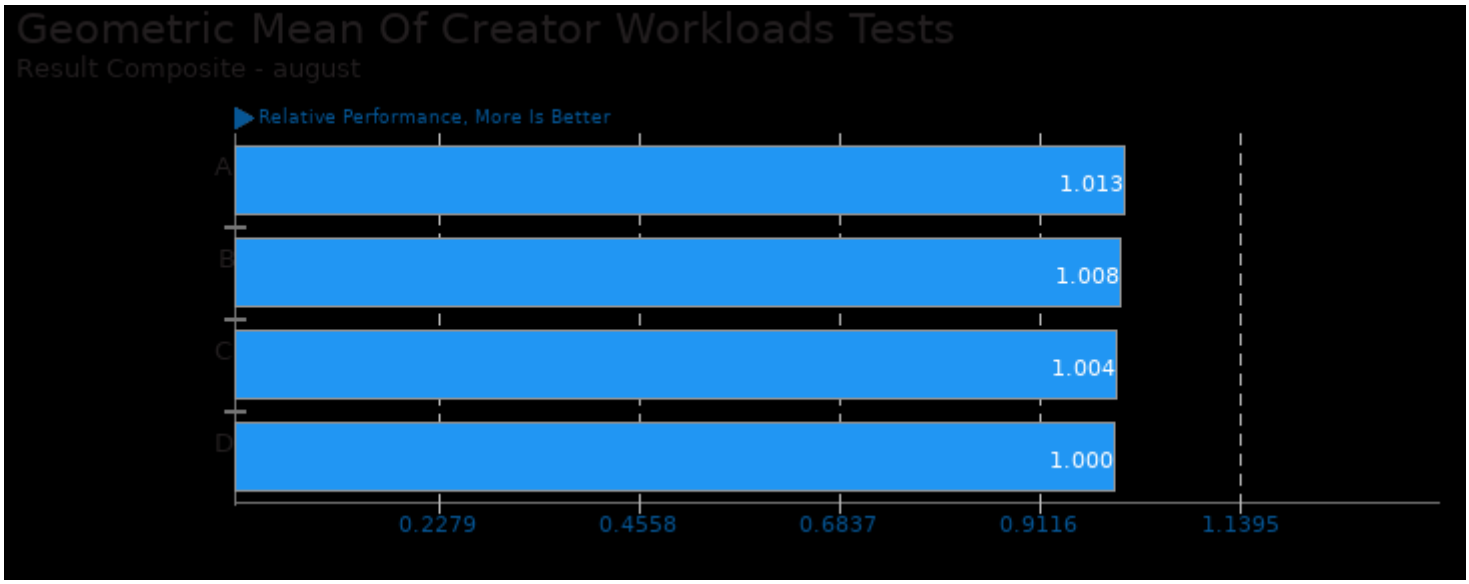
These geometric means are based upon test groupings / test suites for this result file.



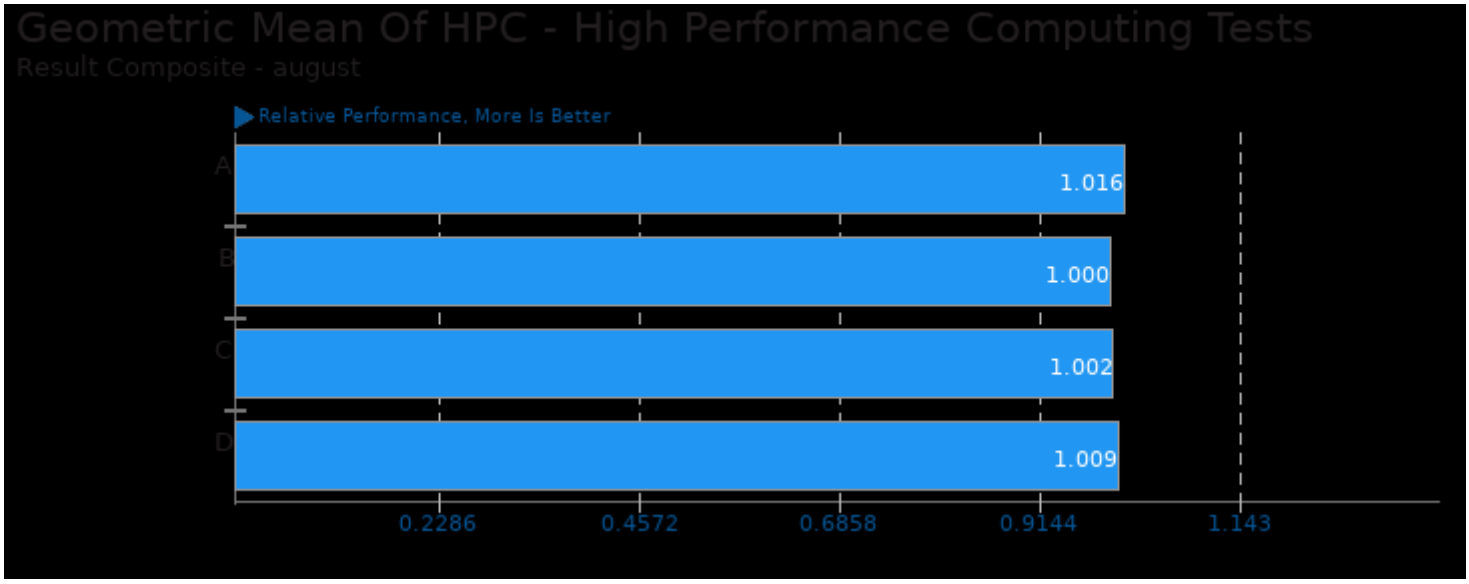
Geometric mean based upon tests: pts/lammps, pts/aircrack-ng and pts/svt-av1



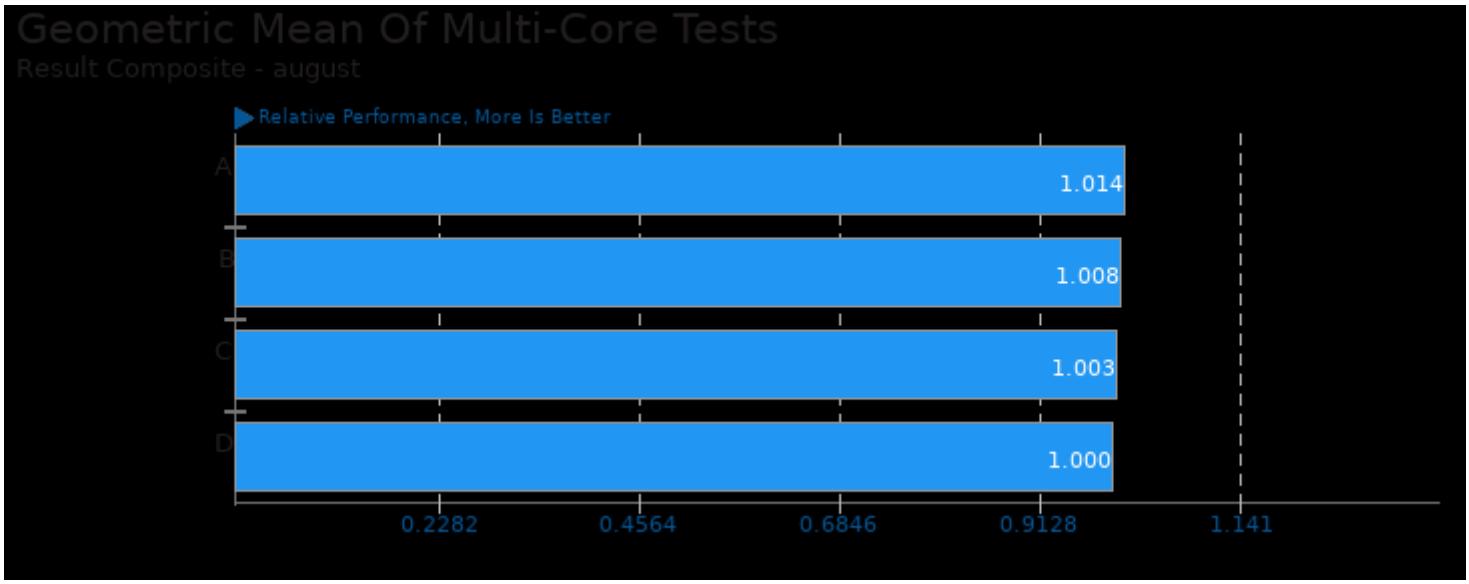
Geometric mean based upon tests: pts/svt-av1, pts/lammps and pts/primesieve



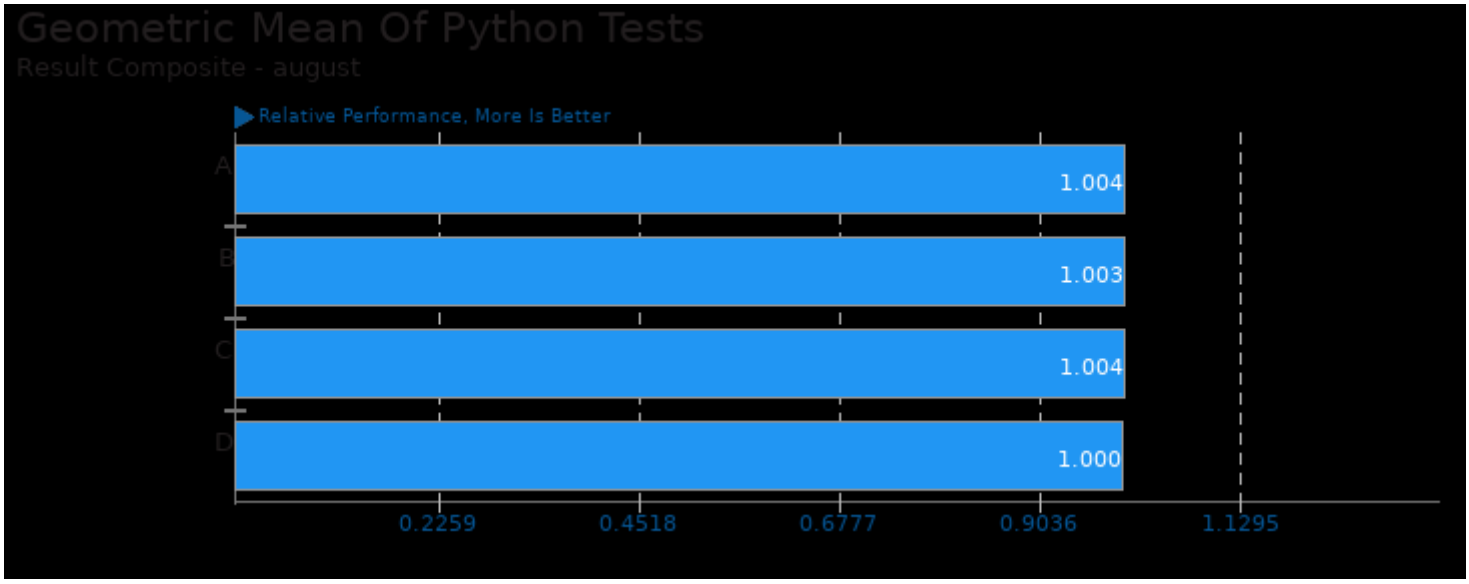
Geometric mean based upon tests: pts/svt-av1, system/inkscape and pts/astcenc



Geometric mean based upon tests: pts/lammps and pts/ai-benchmark

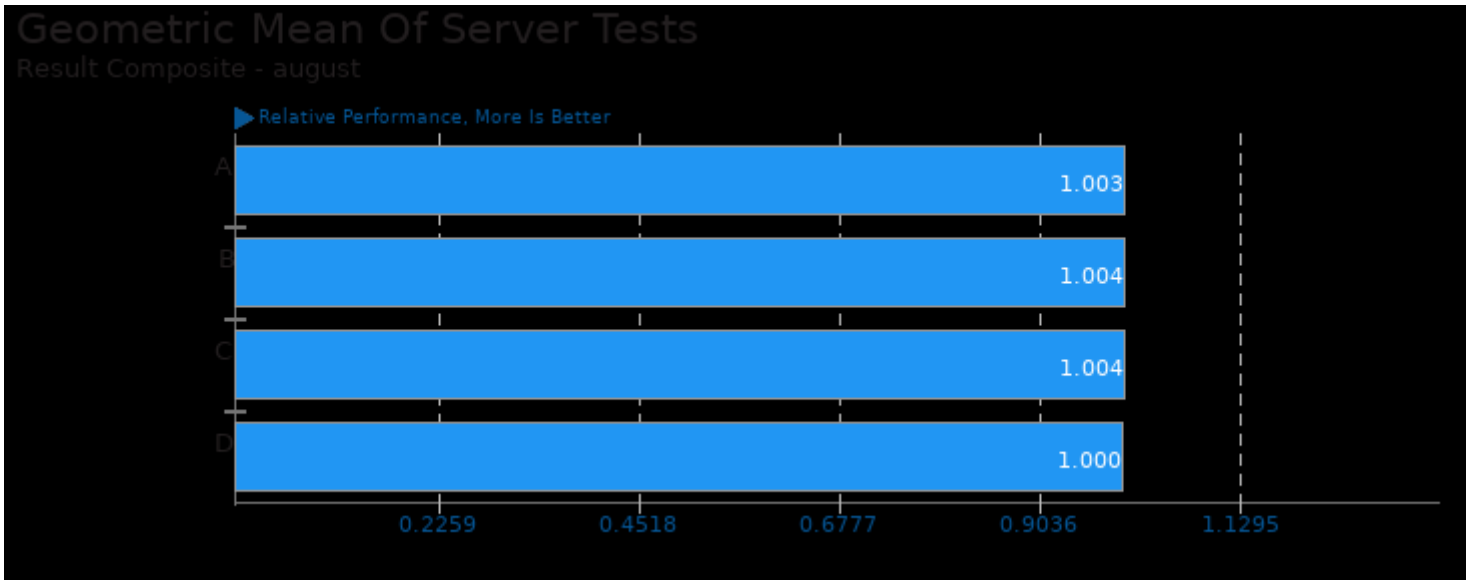


Geometric mean based upon tests: pts/aircrack-ng, pts/svt-av1, pts/primesieve and pts/lammps



Geometric mean based upon tests: pts/spark and pts/ai-benchmark

august



Geometric mean based upon tests: pts/node-web-tooling and pts/spark

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 12:42.