



5850u spark

AMD Ryzen 7 PRO 5850U testing with a HP 8A78 (F.04 BIOS) and AMD Cezanne 512MB on Ubuntu 22.04 via the Phoronix Test Suite.

Automated Executive Summary

B had the most wins, coming in first place for 60% of the tests.

Based on the geometric mean of all complete results, the fastest (B) was 1.007x the speed of the slowest (A).

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

Apache Spark (Row Count: 10000000 - Partitions: 100 - Inner Join Test Time) at 1.078x

Apache Spark (Row Count: 1000000 - Partitions: 500 - SHA-512 Benchmark Time) at 1.072x

Apache Spark (Row Count: 10000000 - Partitions: 100 - Broadcast Inner Join Test Time) at 1.07x

Apache Spark (Row Count: 20000000 - Partitions: 100 - Broadcast Inner Join Test Time) at 1.053x

Apache Spark (Row Count: 1000000 - Partitions: 100 - Group By Test Time) at 1.045x

Apache Spark (Row Count: 10000000 - Partitions: 1000 - Group By Test Time) at 1.042x

Apache Spark (Row Count: 20000000 - Partitions: 500 - Broadcast Inner Join Test Time) at 1.038x

Apache Spark (Row Count: 20000000 - Partitions: 500 - Inner Join Test Time) at 1.037x

Apache Spark (Row Count: 1000000 - Partitions: 500 - Group By Test Time) at 1.034x

Apache Spark (Row Count: 20000000 - Partitions: 1000 - Broadcast Inner Join Test Time) at 1.033x.

Test Systems:

A

B

Processor: AMD Ryzen 7 PRO 5850U @ 1.90GHz (8 Cores / 16 Threads), Motherboard: HP 8A78 (F.04 BIOS), Chipset: AMD Renoir/Cezanne, Memory: 16GB, Disk: 1024GB SK hynix PC711 HFS001TDE9X073N, Graphics: AMD Cezanne 512MB (2000/400MHz), Audio: AMD Renoir Radeon HD Audio, Network: Realtek RTL8822CE 802.11ac PCIe

OS: Ubuntu 22.04, Kernel: 5.19.0-051900rc7-generic (x86_64), Desktop: GNOME Shell 42.2, Display Server: X Server + Wayland, OpenGL: 4.6 Mesa 22.0.1 (LLVM 13.0.1 DRM 3.47), Vulkan: 1.2.204, Compiler: GCC 11.2.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise

Processor Notes: Scaling Governor: acpi-cpufreq schedutil (Boost: Enabled) - CPU Microcode: 0xa50000c

Java Notes: OpenJDK Runtime Environment (build 11.0.15+10-Ubuntu-0ubuntu0.22.04.1)

Python Notes: Python 3.10.4

Security Notes: itlb_multihit: Not affected + I1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio_stale_data: Not affected + retbleed: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Retpolines IBPB: conditional IBRS_FW STIBP: always-on RSB filling + srbsds: Not affected + tsx_async_abort: Not affected

	A	B
Apache Spark - 10000000 - 100 - I.J.T.T (sec)	16.89	15.67
Normalized	92.78%	100%
Standard Deviation	2.8%	
Apache Spark - 1000000 - 500 - S.5.B.T (sec)	4.69	5.03
Normalized	100%	93.24%
Standard Deviation	0.6%	
Apache Spark - 10000000 - 100 - B.I.J.T.T (sec)	16.33	15.26
Normalized	93.45%	100%
Standard Deviation	3.4%	
Apache Spark - 20000000 - 100 - B.I.J.T.T (sec)	32.53	30.90
Normalized	94.99%	100%
Standard Deviation	1.8%	
Apache Spark - 1000000 - 100 - Group By Test Time (sec)	4.42	4.23
Normalized	95.7%	100%
Standard Deviation	1.6%	
Apache Spark - 10000000 - 1000 - Group By Test Time (sec)	10.13	9.72
Normalized	95.95%	100%
Standard Deviation	1.3%	
Apache Spark - 20000000 - 500 - B.I.J.T.T (sec)	30.41	29.29
Normalized	96.32%	100%
Standard Deviation	3.4%	
Apache Spark - 20000000 - 500 - I.J.T.T (sec)	30.94	29.85
Normalized	96.48%	100%
Standard Deviation	3.9%	

Apache Spark - 1000000 - 500 - Group By Test Time (sec)	4.84	4.68
Normalized	96.69%	100%
Standard Deviation	0.7%	
Apache Spark - 2000000 - 1000 - B.I.J.T.T (sec)	29.18	30.15
Normalized	100%	96.78%
Standard Deviation	1.1%	
Apache Spark - 1000000 - 1000 - S.5.B.T (sec)	5.14	5.30
Normalized	100%	96.98%
Standard Deviation	2.5%	
Apache Spark - 1000000 - 2000 - S.5.B.T (sec)	5.50	5.67
Normalized	100%	97%
Standard Deviation	2.3%	
Apache Spark - 4000000 - 1000 - I.J.T.T (sec)	59.54	57.76
Normalized	97.01%	100%
Standard Deviation	1%	
Apache Spark - 4000000 - 1000 - B.I.J.T.T (sec)	59.43	57.660476277
Normalized	97.02%	100%
Standard Deviation	0.8%	
Apache Spark - 4000000 - 100 - I.J.T.T (sec)	59.50	57.87
Normalized	97.26%	100%
Standard Deviation	1.1%	
Apache Spark - 4000000 - 500 - Group By Test Time (sec)	35.20	34.27
Normalized	97.36%	100%
Standard Deviation	1.1%	
Apache Spark - 1000000 - 2000 - C.P.B (sec)	227.64	233.78
Normalized	100%	97.37%
Standard Deviation	0.6%	
Apache Spark - 1000000 - 100 - R.T.T (sec)	14.52	14.14
Normalized	97.38%	100%
Standard Deviation	1.3%	
Apache Spark - 2000000 - 2000 - Group By Test Time (sec)	15.33	14.93
Normalized	97.39%	100%
Standard Deviation	2.1%	
Apache Spark - 4000000 - 2000 - B.I.J.T.T (sec)	59.01	60.43
Normalized	100%	97.65%
Standard Deviation	0.9%	
Apache Spark - 1000000 - 1000 - I.J.T.T (sec)	3.09	3.02
Normalized	97.73%	100%
Standard Deviation	2.8%	
Apache Spark - 1000000 - 500 - B.I.J.T.T (sec)	2.21	2.26
Normalized	100%	97.79%
Standard Deviation	3%	
Apache Spark - 1000000 - 2000 - R.T.T (sec)	4.01	4.10
Normalized	100%	97.8%
Standard Deviation	2.4%	
Apache Spark - 4000000 - 1000 - Group By Test Time (sec)	34.82	34.06
Normalized	97.82%	100%
Standard Deviation	1.4%	
Apache Spark - 1000000 - 100 - S.5.B.T (sec)	4.57	4.67
Normalized	100%	97.86%
Standard Deviation	2.6%	

Apache Spark - 10000000 - 1000 - B.I.J.T.T (sec)	15.20	14.94
Normalized	98.29%	100%
Standard Deviation	0.1%	
Apache Spark - 10000000 - 2000 - I.J.T.T (sec)	16.78	17.06
Normalized	100%	98.36%
Standard Deviation	0.6%	
Apache Spark - 40000000 - 500 - I.J.T.T (sec)	59.17	60.15
Normalized	100%	98.37%
Standard Deviation	1.8%	
Apache Spark - 20000000 - 100 - Group By Test Time (sec)	15.23	15.48
Normalized	100%	98.39%
Standard Deviation	0.5%	
Apache Spark - 10000000 - 1000 - I.J.T.T (sec)	16.11	15.85
Normalized	98.39%	100%
Standard Deviation	0.4%	
Apache Spark - 20000000 - 100 - C.P.B.U.D (sec)	13.15	12.94
Normalized	98.4%	100%
Standard Deviation	1.8%	
Apache Spark - 40000000 - 1000 - R.T.T (sec)	51.41	50.59
Normalized	98.4%	100%
Standard Deviation	1.7%	
Apache Spark - 1000000 - 1000 - C.P.B.U.D (sec)	12.94	12.74
Normalized	98.45%	100%
Standard Deviation	0.8%	
Apache Spark - 40000000 - 2000 - R.T.T (sec)	52.00	51.22
Normalized	98.5%	100%
Standard Deviation	1.9%	
Apache Spark - 10000000 - 1000 - R.T.T (sec)	14.38	14.17
Normalized	98.54%	100%
Standard Deviation	0.1%	
Apache Spark - 10000000 - 500 - B.I.J.T.T (sec)	15.21	14.99
Normalized	98.55%	100%
Standard Deviation	0.4%	
Apache Spark - 20000000 - 1000 - I.J.T.T (sec)	29.84	30.27
Normalized	100%	98.58%
Standard Deviation	0.2%	
Apache Spark - 20000000 - 100 - I.J.T.T (sec)	32.31	32.77
Normalized	100%	98.6%
Standard Deviation	2.1%	
Apache Spark - 1000000 - 1000 - Group By Test Time (sec)	5.14	5.07
Normalized	98.64%	100%
Standard Deviation	2%	
Apache Spark - 1000000 - 1000 - R.T.T (sec)	3.63	3.68
Normalized	100%	98.64%
Standard Deviation	2.6%	
Apache Spark - 1000000 - 2000 - Group By Test Time (sec)	5.92	5.84
Normalized	98.65%	100%
Standard Deviation	0.6%	
Apache Spark - 40000000 - 100 - R.T.T (sec)	51.47	52.13
Normalized	100%	98.73%
Standard Deviation	1.5%	

Apache Spark - 20000000 - 1000 - R.T.T (sec)	26.03	26.35
Normalized	100%	98.79%
Standard Deviation	1.1%	
Apache Spark - 20000000 - 500 - S.5.B.T (sec)	37.25	37.70
Normalized	100%	98.81%
Standard Deviation	0.7%	
Apache Spark - 1000000 - 500 - R.T.T (sec)	3.36	3.32
Normalized	98.81%	100%
Standard Deviation	1%	
Apache Spark - 20000000 - 1000 - C.P.B.U.D (sec)	12.87	13.01
Normalized	100%	98.92%
Standard Deviation	0.6%	
Apache Spark - 10000000 - 500 - C.P.B (sec)	228.32	225.89
Normalized	98.94%	100%
Standard Deviation	0.6%	
Apache Spark - 10000000 - 2000 - Group By Test Time (sec)	10.63	10.52
Normalized	98.97%	100%
Standard Deviation	0.2%	
Apache Spark - 10000000 - 100 - S.5.B.T (sec)	21.12	20.91
Normalized	99.01%	100%
Standard Deviation	0.3%	
Apache Spark - 40000000 - 1000 - C.P.B (sec)	228.53	226.28
Normalized	99.02%	100%
Standard Deviation	0.4%	
Apache Spark - 10000000 - 2000 - B.I.J.T.T (sec)	15.79	15.64
Normalized	99.05%	100%
Standard Deviation	0.7%	
Apache Spark - 40000000 - 100 - Group By Test Time (sec)	39.78	40.12
Normalized	100%	99.15%
Standard Deviation	1.7%	
Apache Spark - 1000000 - 100 - I.J.T.T (sec)	2.39	2.37
Normalized	99.16%	100%
Standard Deviation	1.8%	
Apache Spark - 10000000 - 500 - I.J.T.T (sec)	15.66	15.53
Normalized	99.17%	100%
Standard Deviation	0.8%	
Apache Spark - 1000000 - 100 - C.P.B (sec)	227.95	229.77
Normalized	100%	99.21%
Standard Deviation	0.6%	
Apache Spark - 10000000 - 500 - R.T.T (sec)	14.21	14.32
Normalized	100%	99.23%
Standard Deviation	0.7%	
Apache Spark - 10000000 - 500 - Group By Test Time (sec)	9.81	9.74
Normalized	99.29%	100%
Standard Deviation	1.9%	
Apache Spark - 10000000 - 1000 - C.P.B (sec)	228.69	227.10
Normalized	99.3%	100%
Standard Deviation	0.9%	
Apache Spark - 1000000 - 2000 - C.P.B.U.D (sec)	12.91	13.00
Normalized	100%	99.31%
Standard Deviation	0.7%	

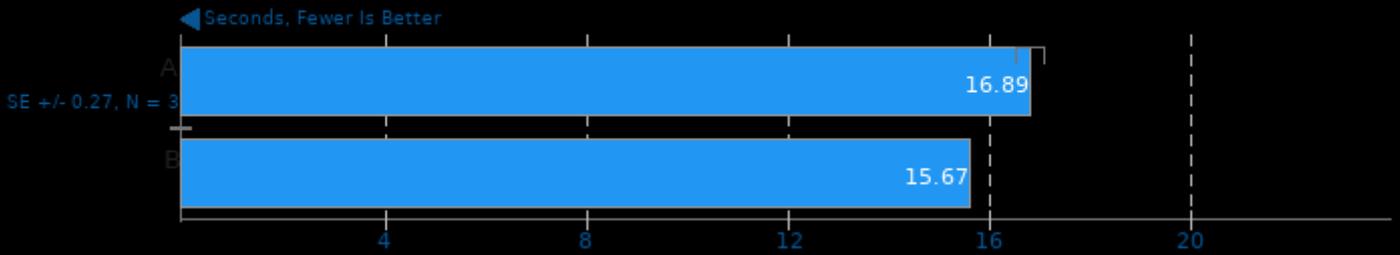
Apache Spark - 10000000 - 500 - C.P.B.U.D (sec)	12.93	13.02
Normalized	100%	99.31%
Standard Deviation	0.5%	
Apache Spark - 40000000 - 100 - S.5.B.T (sec)	70.96	70.48
Normalized	99.32%	100%
Standard Deviation	0.5%	
Apache Spark - 10000000 - 1000 - S.5.B.T (sec)	20.86	20.72
Normalized	99.33%	100%
Standard Deviation	0.4%	
Apache Spark - 20000000 - 1000 - C.P.B (sec)	230.60	229.06
Normalized	99.33%	100%
Standard Deviation	0.3%	
Apache Spark - 1000000 - 1000 - C.P.B (sec)	229.81	231.33
Normalized	100%	99.34%
Standard Deviation	0.6%	
Apache Spark - 20000000 - 500 - R.T.T (sec)	26.25	26.08
Normalized	99.35%	100%
Standard Deviation	0.2%	
Apache Spark - 1000000 - 100 - R.T.T (sec)	3.16	3.18
Normalized	100%	99.37%
Standard Deviation	2.1%	
Apache Spark - 40000000 - 2000 - C.P.B.U.D (sec)	12.86	12.94
Normalized	100%	99.38%
Standard Deviation	0.4%	
Apache Spark - 40000000 - 100 - C.P.B.U.D (sec)	12.93	12.86
Normalized	99.46%	100%
Standard Deviation	0.5%	
Apache Spark - 20000000 - 1000 - S.5.B.T (sec)	37.63	37.43
Normalized	99.47%	100%
Standard Deviation	0.9%	
Apache Spark - 20000000 - 2000 - I.J.T.T (sec)	30.47	30.63
Normalized	100%	99.48%
Standard Deviation	0.7%	
Apache Spark - 40000000 - 2000 - S.5.B.T (sec)	71.58	71.95
Normalized	100%	99.49%
Standard Deviation	0.1%	
Apache Spark - 1000000 - 100 - B.I.J.T.T (sec)	1.98	1.99
Normalized	100%	99.5%
Standard Deviation	1.5%	
Apache Spark - 1000000 - 2000 - I.J.T.T (sec)	3.99	3.97
Normalized	99.5%	100%
Standard Deviation	4.4%	
Apache Spark - 40000000 - 100 - B.I.J.T.T (sec)	57.06	57.34
Normalized	100%	99.51%
Standard Deviation	1%	
Apache Spark - 20000000 - 2000 - C.P.B.U.D (sec)	12.86	12.92
Normalized	100%	99.54%
Standard Deviation	0.2%	
Apache Spark - 10000000 - 500 - S.5.B.T (sec)	20.40	20.49
Normalized	100%	99.56%
Standard Deviation	1.4%	
Apache Spark - 10000000 - 2000 - S.5.B.T (sec)	21.16	21.07
Normalized	99.57%	100%
Standard Deviation	0.5%	

Apache Spark - 10000000 - 100 - Group By Test Time (sec)	9.67	9.63
Normalized	99.59%	100%
Standard Deviation	1.1%	
Apache Spark - 40000000 - 1000 - C.P.B.U.D (sec)	12.80	12.85
Normalized	100%	99.61%
Standard Deviation	0.6%	
Apache Spark - 20000000 - 100 - C.P.B (sec)	229.27	228.38
Normalized	99.61%	100%
Standard Deviation	0.8%	
Apache Spark - 40000000 - 2000 - I.J.T.T (sec)	59.39	59.16
Normalized	99.61%	100%
Standard Deviation	1.7%	
Apache Spark - 40000000 - 500 - C.P.B.U.D (sec)	12.92	12.87
Normalized	99.61%	100%
Standard Deviation	0.3%	
Apache Spark - 1000000 - 500 - C.P.B.U.D (sec)	12.94	12.89
Normalized	99.61%	100%
Standard Deviation	0.3%	
Apache Spark - 40000000 - 500 - R.T.T (sec)	51.85	51.65
Normalized	99.61%	100%
Standard Deviation	1%	
Apache Spark - 20000000 - 100 - S.5.B.T (sec)	38.93	38.78
Normalized	99.61%	100%
Standard Deviation	0.4%	
Apache Spark - 1000000 - 500 - I.J.T.T (sec)	2.62	2.61
Normalized	99.62%	100%
Standard Deviation	2.6%	
Apache Spark - 10000000 - 100 - C.P.B (sec)	229.17	228.357674803
Normalized	99.65%	100%
Standard Deviation	0.4%	
Apache Spark - 20000000 - 2000 - S.5.B.T (sec)	37.67	37.55
Normalized	99.68%	100%
Standard Deviation	0.6%	
Apache Spark - 10000000 - 1000 - C.P.B.U.D (sec)	12.86	12.82
Normalized	99.69%	100%
Standard Deviation	0.2%	
Apache Spark - 10000000 - 2000 - C.P.B.U.D (sec)	12.88	12.92
Normalized	100%	99.69%
Standard Deviation	0.2%	
Apache Spark - 20000000 - 500 - Group By Test Time (sec)	15.02	15.06
Normalized	100%	99.73%
Standard Deviation	2.6%	
Apache Spark - 20000000 - 100 - R.T.T (sec)	27.88	27.95
Normalized	100%	99.75%
Standard Deviation	1%	
Apache Spark - 40000000 - 100 - C.P.B (sec)	228.76	228.20
Normalized	99.76%	100%
Standard Deviation	0.3%	
Apache Spark - 40000000 - 500 - B.I.J.T.T (sec)	57.79	57.65
Normalized	99.76%	100%
Standard Deviation	1.1%	
Apache Spark - 40000000 - 500 - S.5.B.T (sec)	70.91	71.08
Normalized	100%	99.76%

	Standard Deviation	0.2%	
Apache Spark - 20000000 - 2000 - B.I.J.T.T (sec)		29.28	29.21
	Normalized	99.76%	100%
	Standard Deviation	0.6%	
Apache Spark - 10000000 - 100 - C.P.B.U.D (sec)		12.93	12.90
	Normalized	99.77%	100%
	Standard Deviation	0.7%	
Apache Spark - 40000000 - 2000 - C.P.B (sec)		229.38	229.80
	Normalized	100%	99.82%
	Standard Deviation	0.6%	
Apache Spark - 40000000 - 2000 - Group By Test Time (sec)		34.61	34.55
	Normalized	99.83%	100%
	Standard Deviation	0.8%	
Apache Spark - 20000000 - 500 - C.P.B.U.D (sec)		12.91	12.89
	Normalized	99.85%	100%
	Standard Deviation	0.5%	
Apache Spark - 1000000 - 100 - C.P.B.U.D (sec)		12.91	12.89
	Normalized	99.85%	100%
	Standard Deviation	0.6%	
Apache Spark - 20000000 - 2000 - R.T.T (sec)		26.52	26.56
	Normalized	100%	99.85%
	Standard Deviation	0.7%	
Apache Spark - 20000000 - 500 - C.P.B (sec)		228.20	227.86
	Normalized	99.85%	100%
	Standard Deviation	0.3%	
Apache Spark - 1000000 - 500 - C.P.B (sec)		228.80	228.61
	Normalized	99.92%	100%
	Standard Deviation	1.3%	
Apache Spark - 20000000 - 2000 - C.P.B (sec)		230.56	230.39
	Normalized	99.93%	100%
	Standard Deviation	0.5%	
Apache Spark - 10000000 - 2000 - R.T.T (sec)		14.70	14.69
	Normalized	99.93%	100%
	Standard Deviation	1.2%	
Apache Spark - 10000000 - 2000 - C.P.B (sec)		228.15	228.30
	Normalized	100%	99.93%
	Standard Deviation	0.1%	
Apache Spark - 40000000 - 500 - C.P.B (sec)		230.49	230.63
	Normalized	100%	99.94%
	Standard Deviation	0.7%	
Apache Spark - 40000000 - 1000 - S.5.B.T (sec)		71.18	71.22
	Normalized	100%	99.94%
	Standard Deviation	0.4%	
Apache Spark - 20000000 - 1000 - Group By Test Time (sec)		15.15	15.15
	Standard Deviation	2.4%	
Apache Spark - 1000000 - 2000 - B.I.J.T.T (sec)		3.70	3.13
	Normalized	84.59%	100%
	Standard Deviation	9.9%	
Apache Spark - 1000000 - 1000 - B.I.J.T.T (sec)		2.91	2.34
	Normalized	80.41%	100%
	Standard Deviation	13.3%	

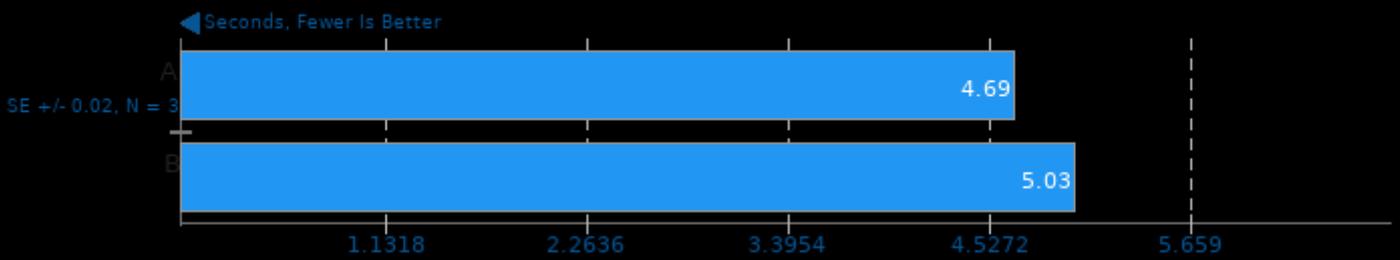
Apache Spark 3.3

Row Count: 10000000 - Partitions: 100 - Inner Join Test Time



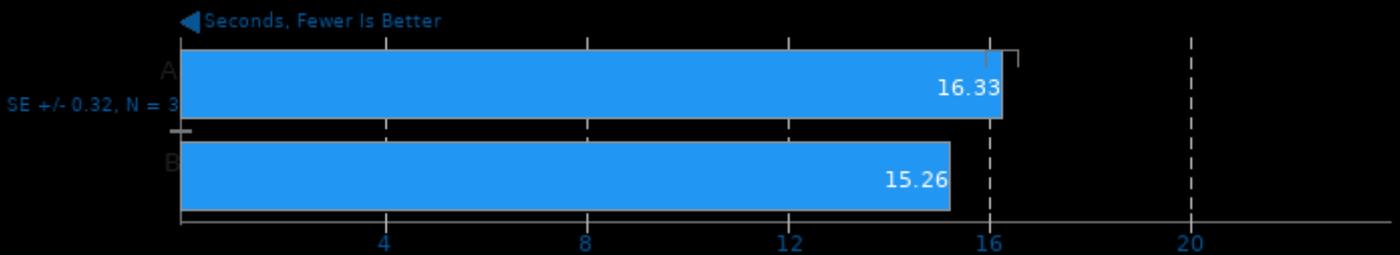
Apache Spark 3.3

Row Count: 1000000 - Partitions: 500 - SHA-512 Benchmark Time



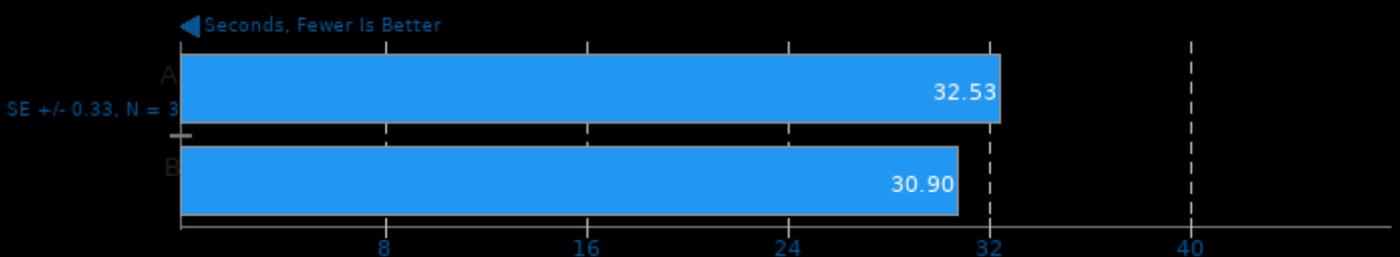
Apache Spark 3.3

Row Count: 10000000 - Partitions: 100 - Broadcast Inner Join Test Time



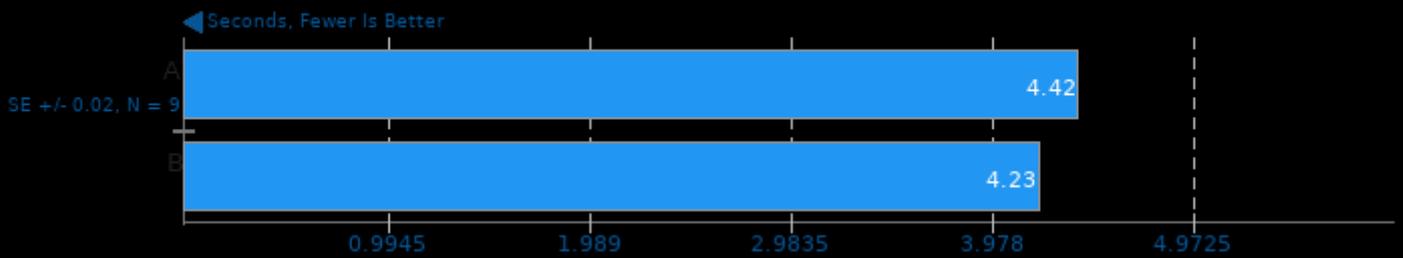
Apache Spark 3.3

Row Count: 20000000 - Partitions: 100 - Broadcast Inner Join Test Time



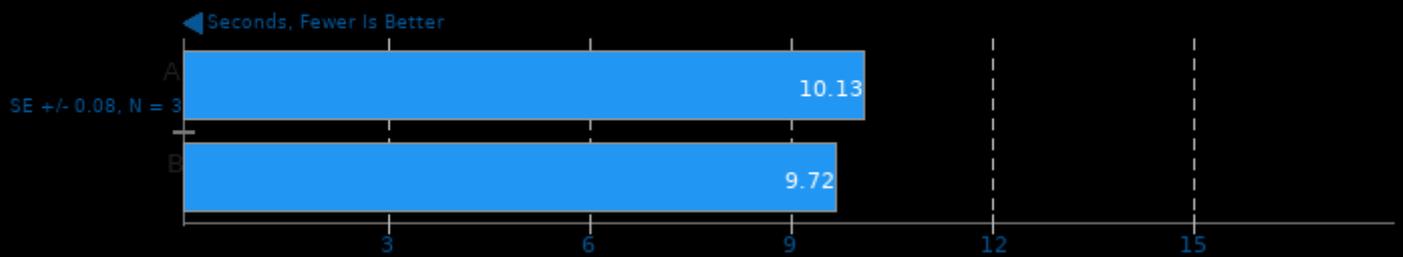
Apache Spark 3.3

Row Count: 1000000 - Partitions: 100 - Group By Test Time



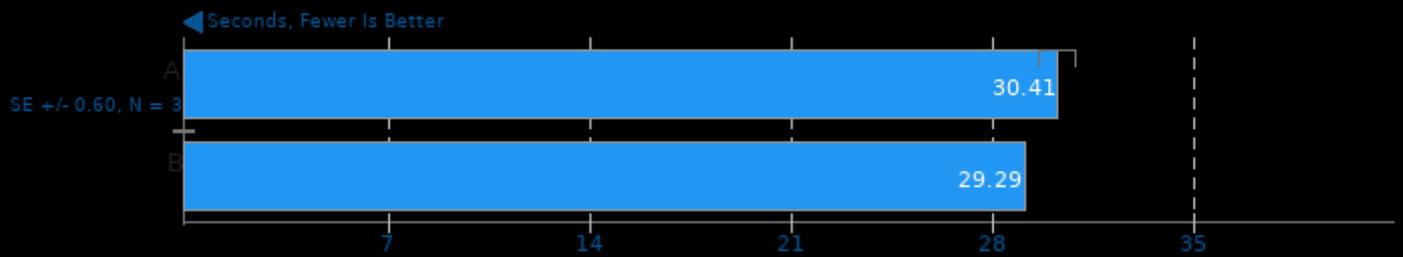
Apache Spark 3.3

Row Count: 10000000 - Partitions: 1000 - Group By Test Time



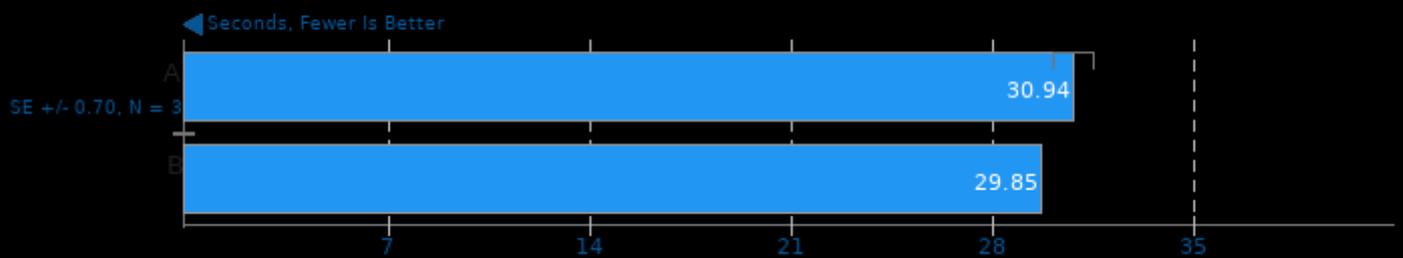
Apache Spark 3.3

Row Count: 20000000 - Partitions: 500 - Broadcast Inner Join Test Time



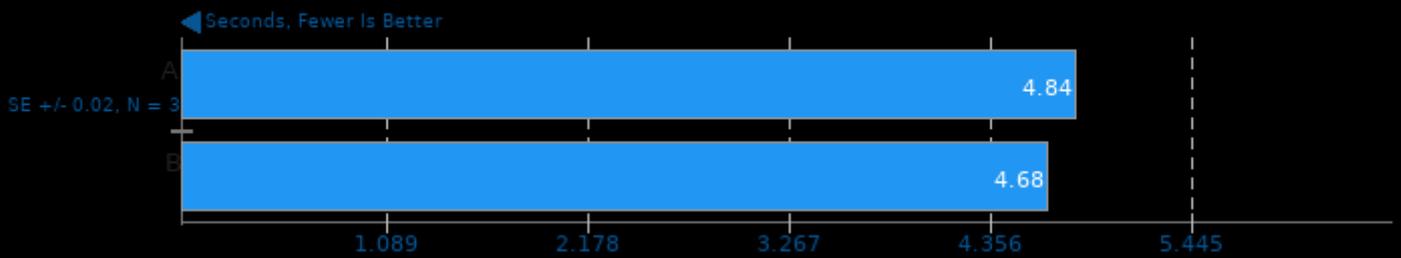
Apache Spark 3.3

Row Count: 20000000 - Partitions: 500 - Inner Join Test Time



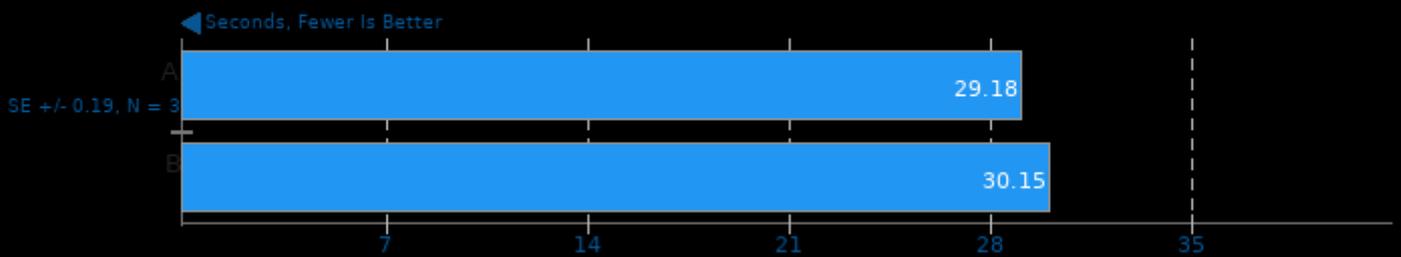
Apache Spark 3.3

Row Count: 1000000 - Partitions: 500 - Group By Test Time



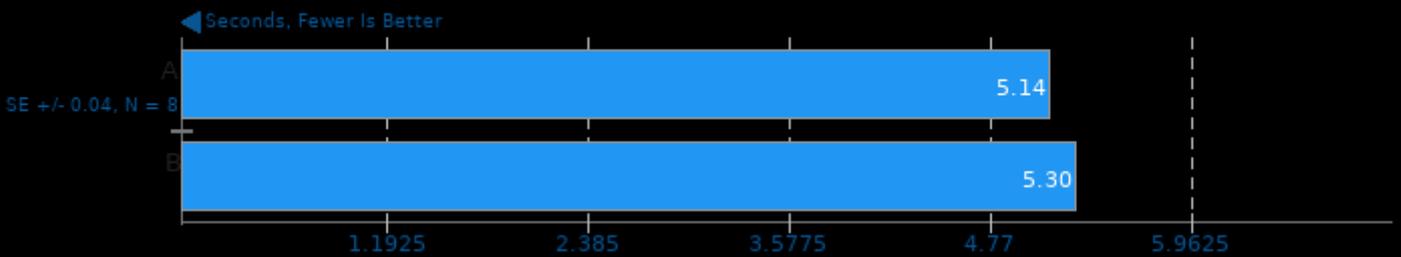
Apache Spark 3.3

Row Count: 20000000 - Partitions: 1000 - Broadcast Inner Join Test Time



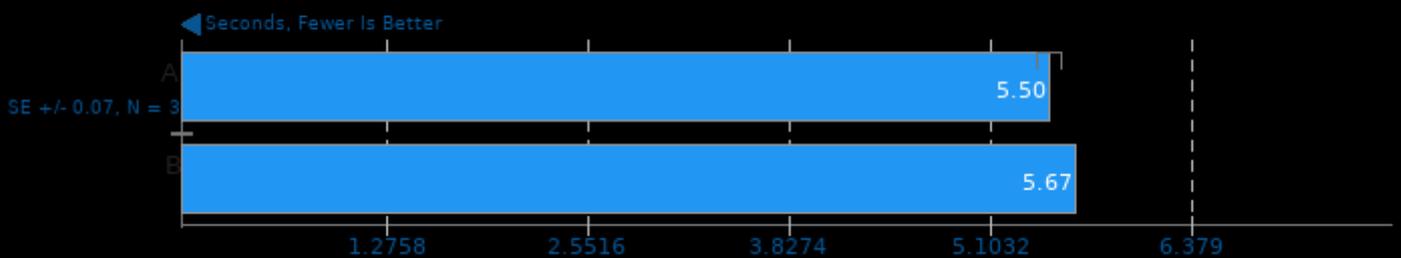
Apache Spark 3.3

Row Count: 1000000 - Partitions: 1000 - SHA-512 Benchmark Time



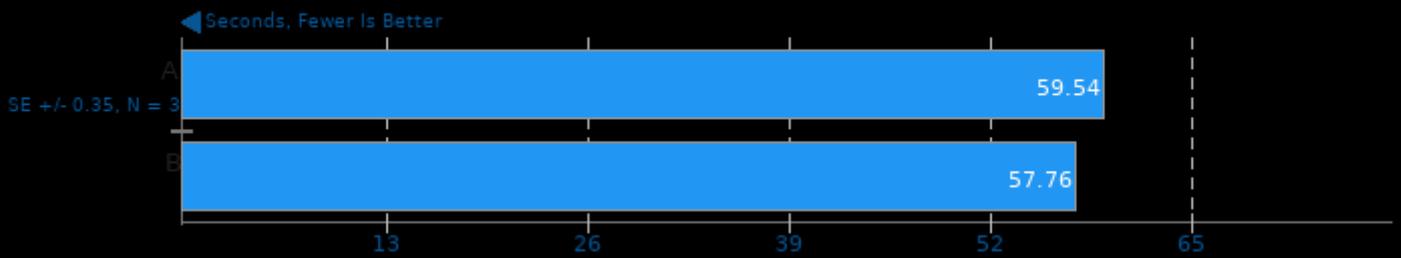
Apache Spark 3.3

Row Count: 1000000 - Partitions: 2000 - SHA-512 Benchmark Time



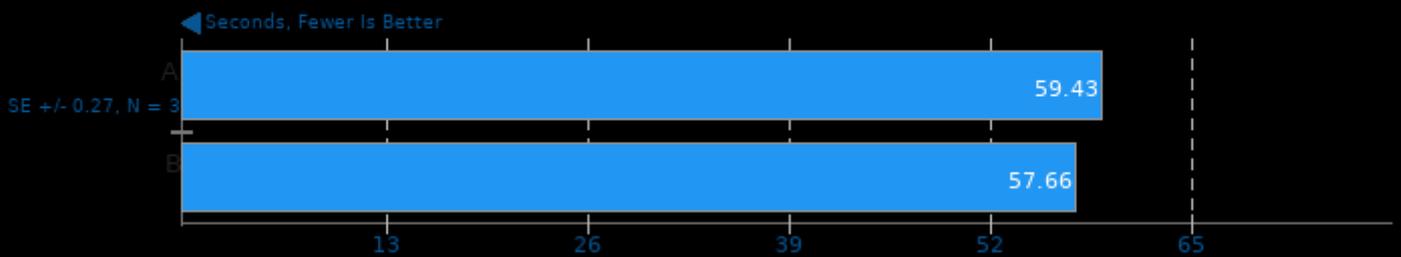
Apache Spark 3.3

Row Count: 40000000 - Partitions: 1000 - Inner Join Test Time



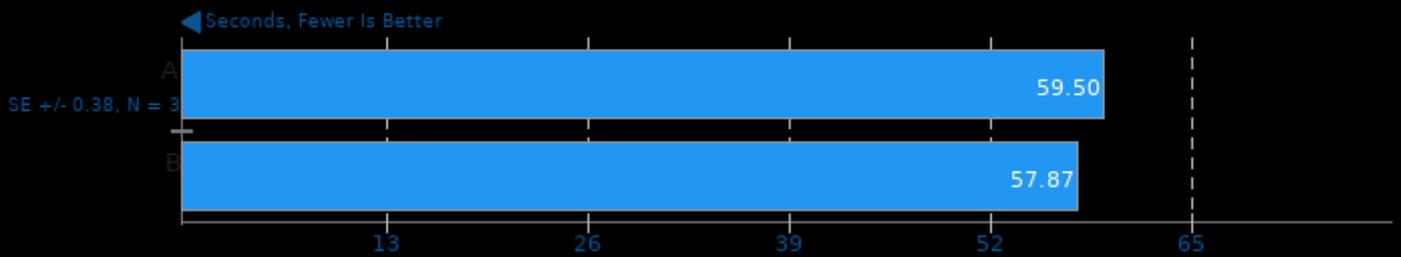
Apache Spark 3.3

Row Count: 40000000 - Partitions: 1000 - Broadcast Inner Join Test Time



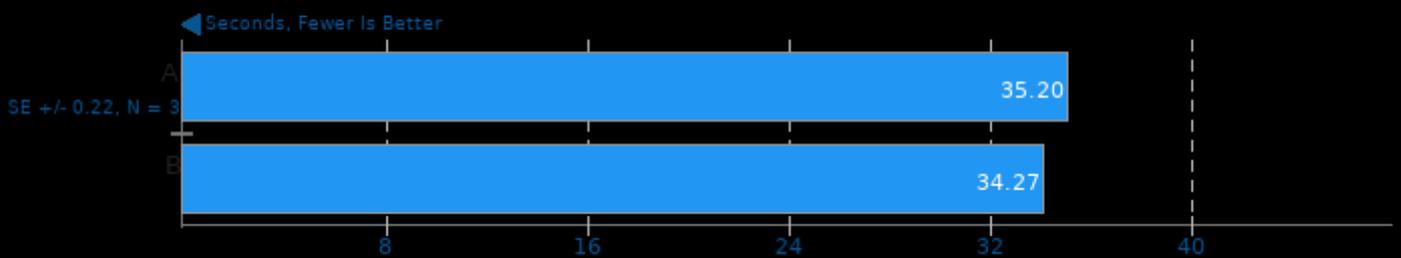
Apache Spark 3.3

Row Count: 40000000 - Partitions: 100 - Inner Join Test Time



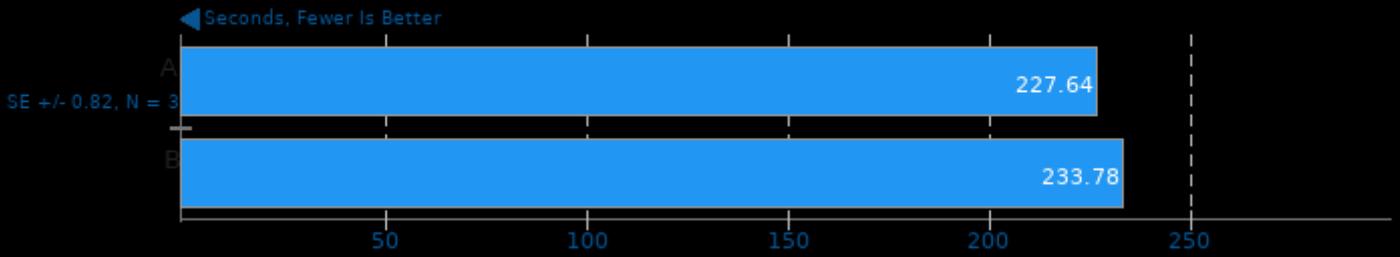
Apache Spark 3.3

Row Count: 40000000 - Partitions: 500 - Group By Test Time



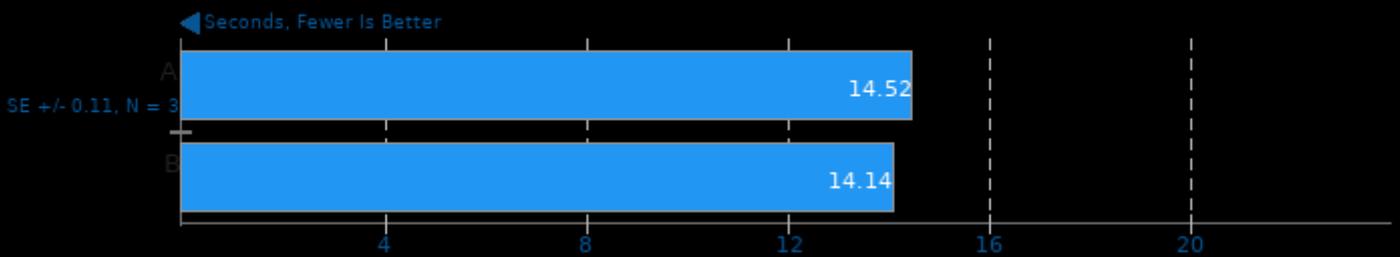
Apache Spark 3.3

Row Count: 1000000 - Partitions: 2000 - Calculate Pi Benchmark



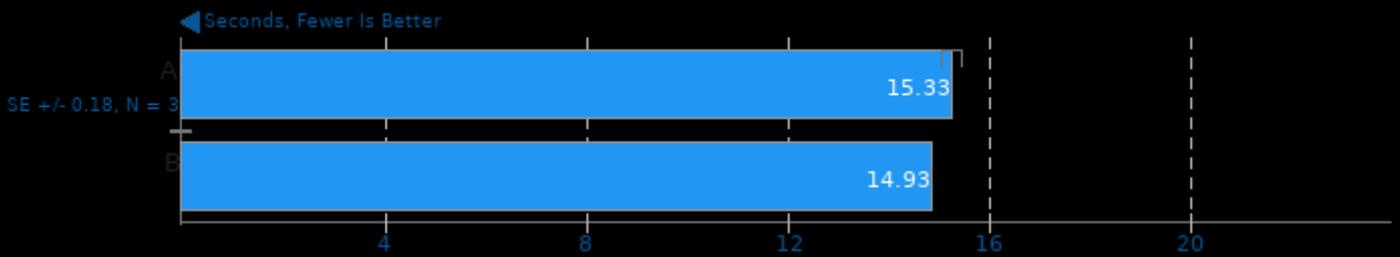
Apache Spark 3.3

Row Count: 10000000 - Partitions: 100 - Repartition Test Time



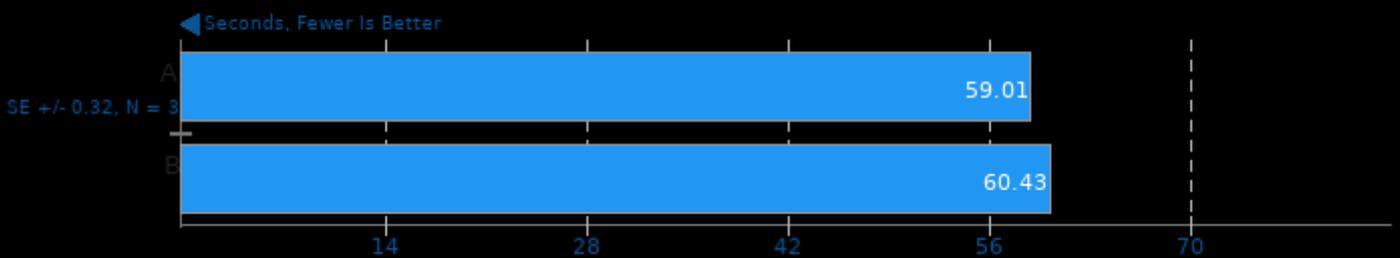
Apache Spark 3.3

Row Count: 20000000 - Partitions: 2000 - Group By Test Time



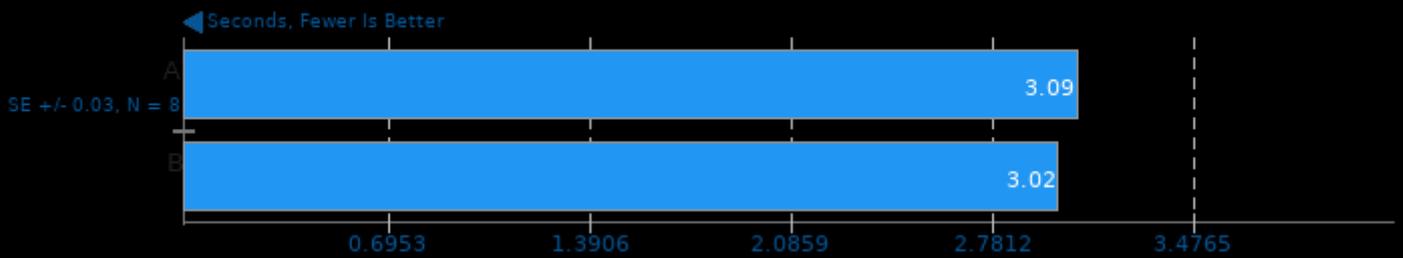
Apache Spark 3.3

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



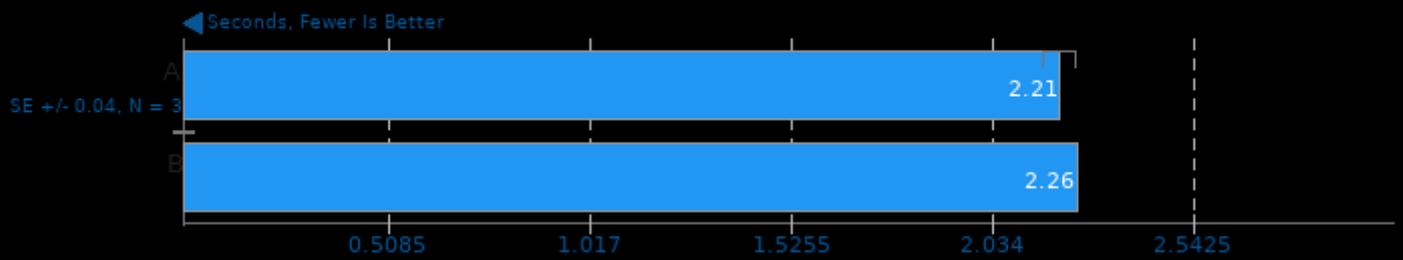
Apache Spark 3.3

Row Count: 1000000 - Partitions: 1000 - Inner Join Test Time



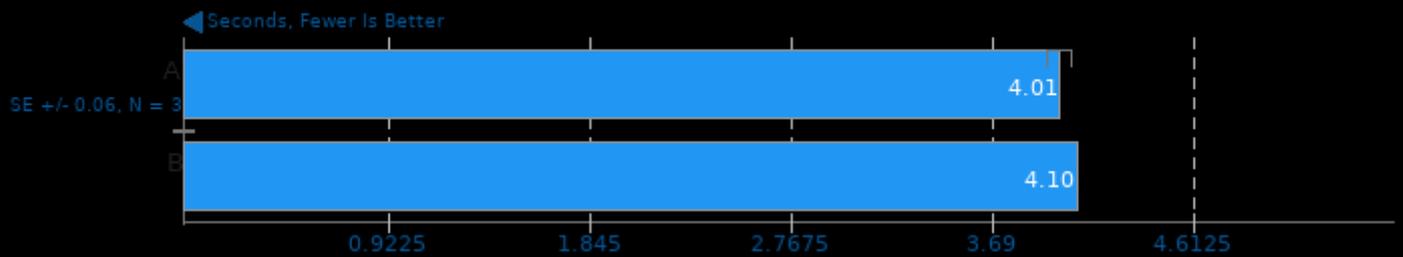
Apache Spark 3.3

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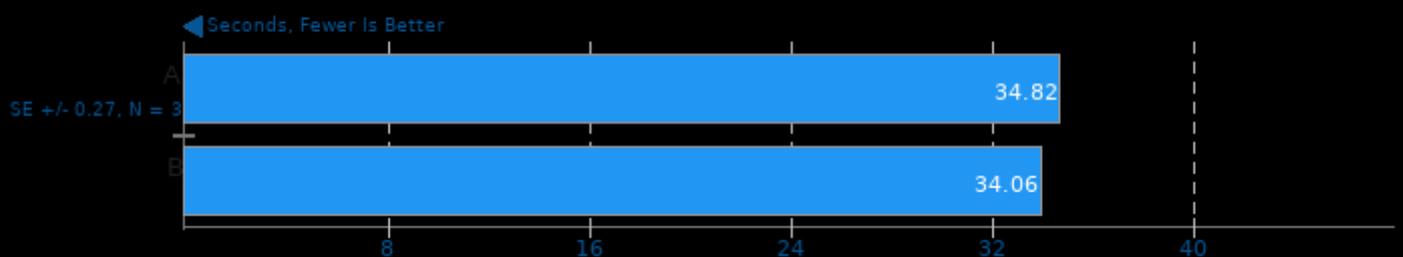
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Row Count: 1000000 - Partitions: 2000 - Repartition Test Time



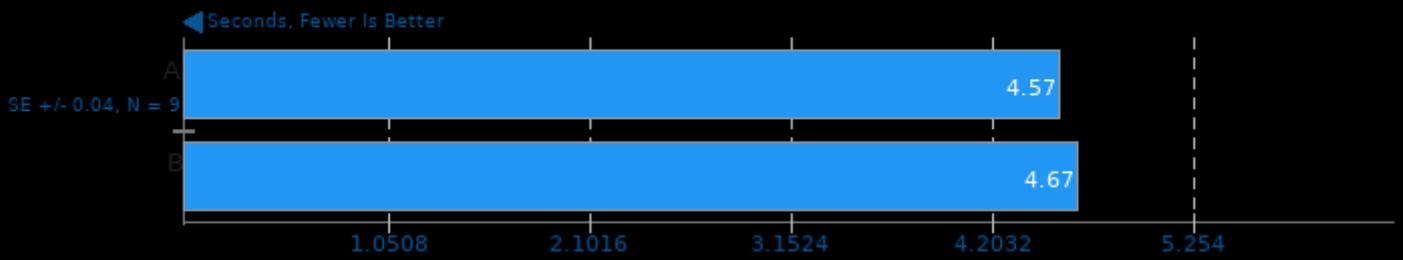
Apache Spark 3.3

Row Count: 40000000 - Partitions: 1000 - Group By Test Time



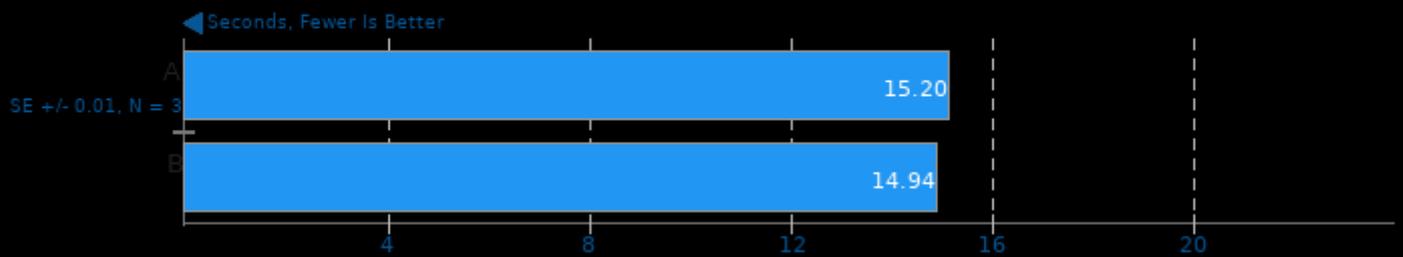
Apache Spark 3.3

Row Count: 1000000 - Partitions: 100 - SHA-512 Benchmark Time



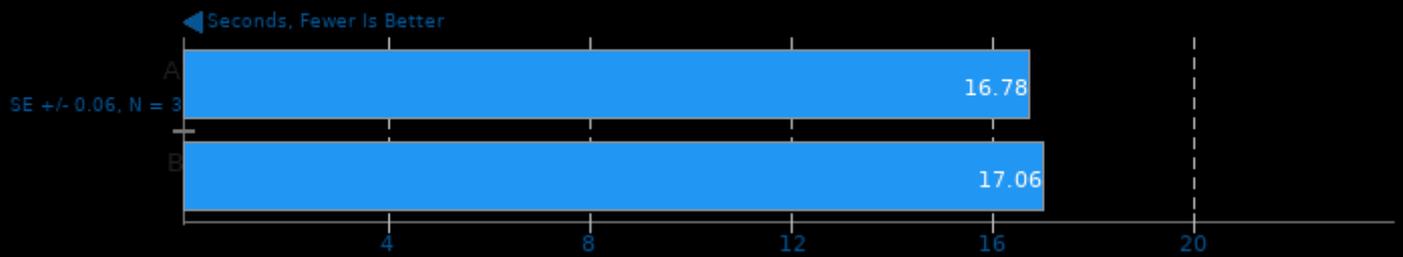
Apache Spark 3.3

Row Count: 10000000 - Partitions: 1000 - Broadcast Inner Join Test Time



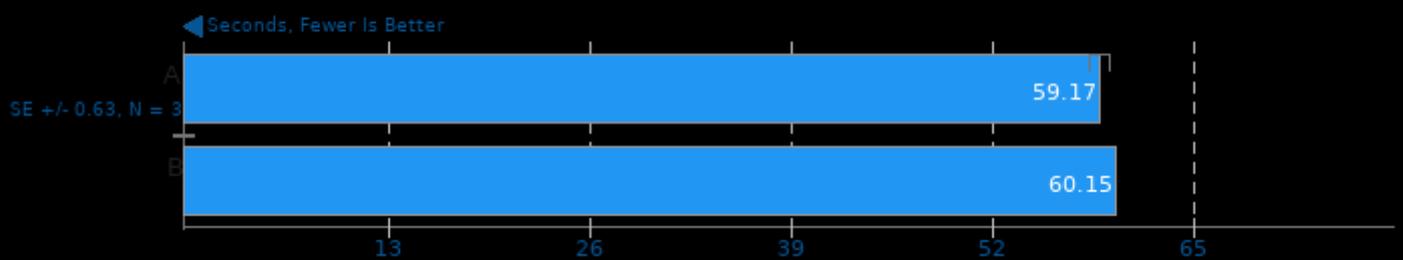
Apache Spark 3.3

Row Count: 10000000 - Partitions: 2000 - Inner Join Test Time



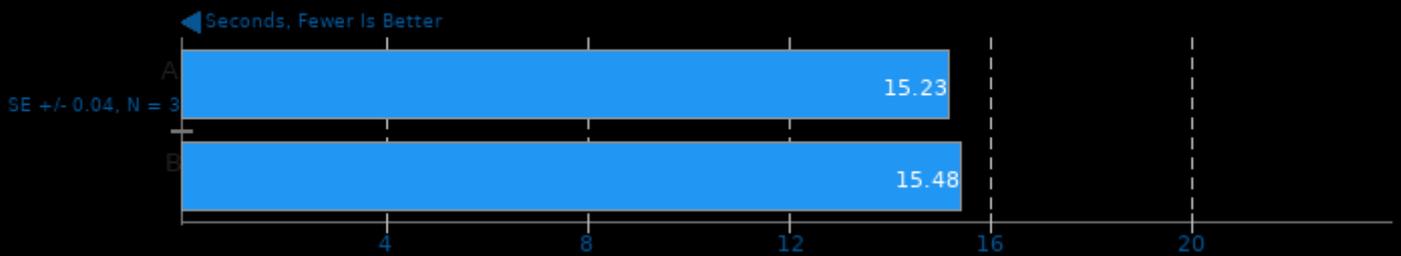
Apache Spark 3.3

Row Count: 40000000 - Partitions: 500 - Inner Join Test Time



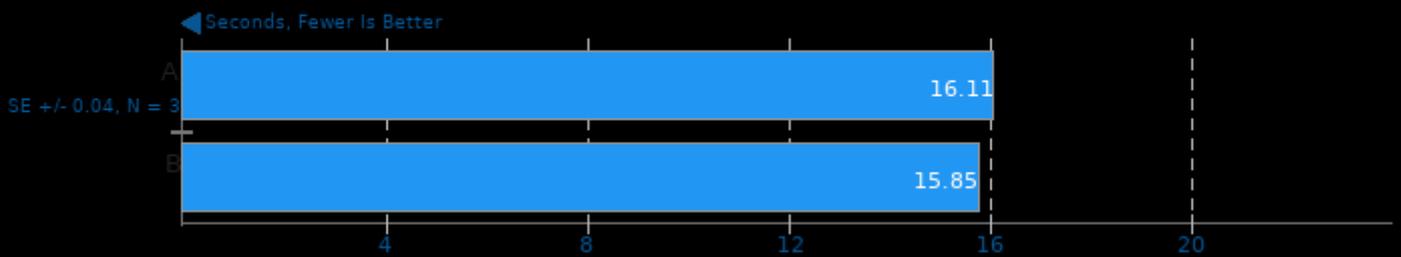
Apache Spark 3.3

Row Count: 20000000 - Partitions: 100 - Group By Test Time



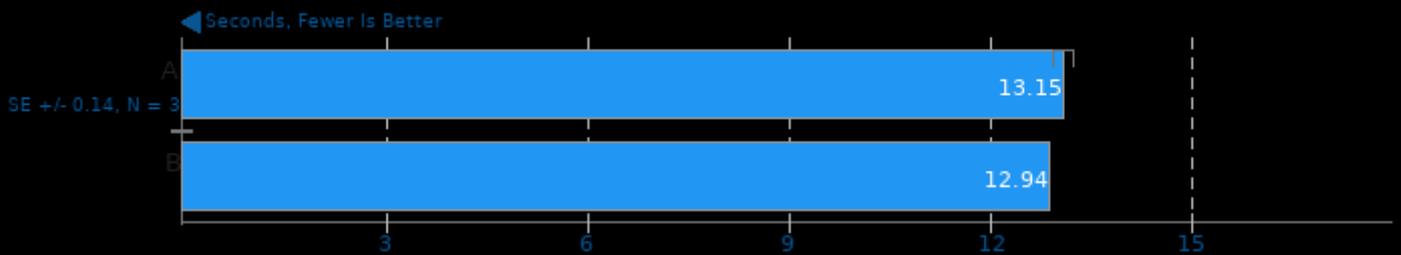
Apache Spark 3.3

Row Count: 10000000 - Partitions: 1000 - Inner Join Test Time



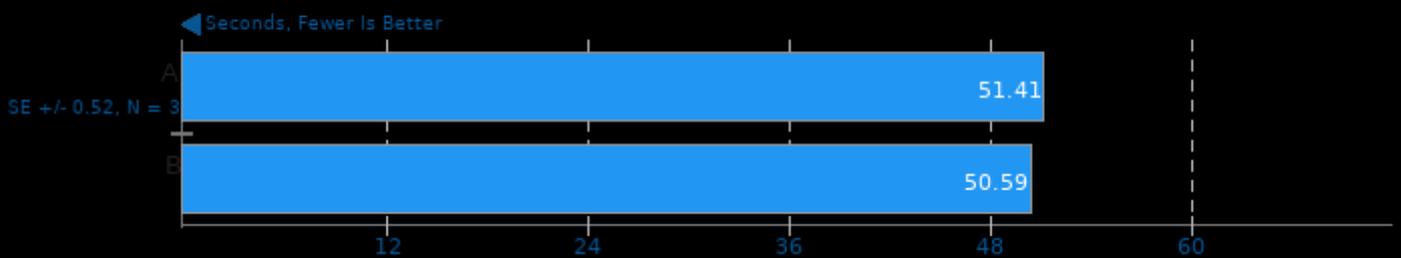
Apache Spark 3.3

Row Count: 20000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe



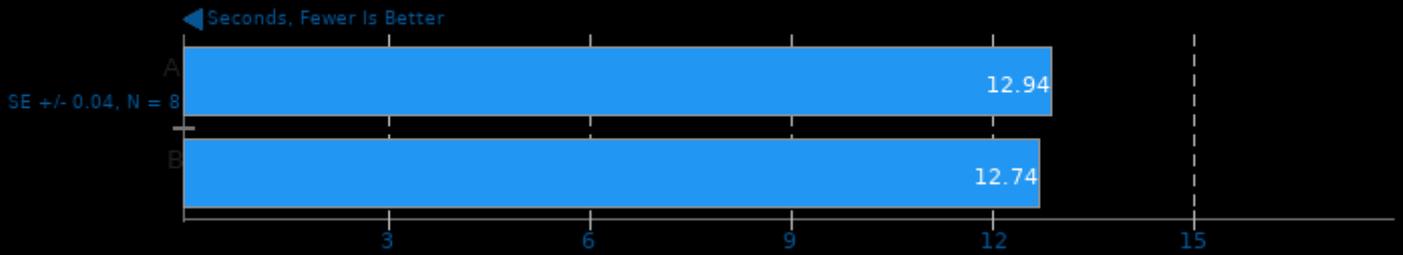
Apache Spark 3.3

Row Count: 40000000 - Partitions: 1000 - Repartition Test Time



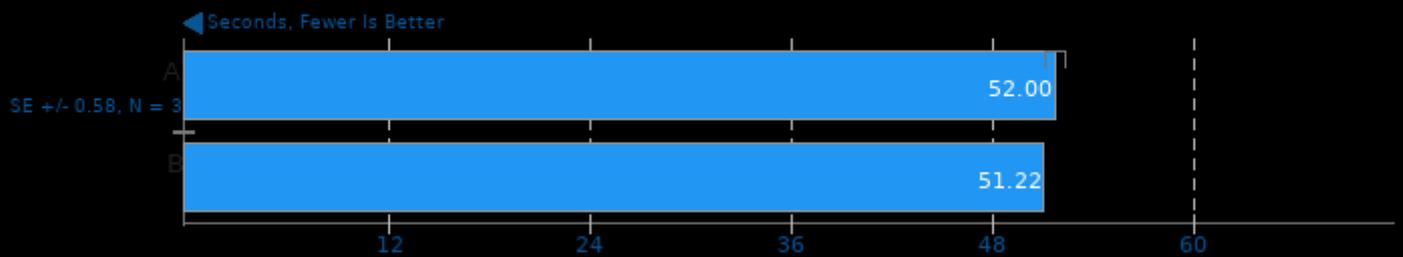
Apache Spark 3.3

Row Count: 1000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe



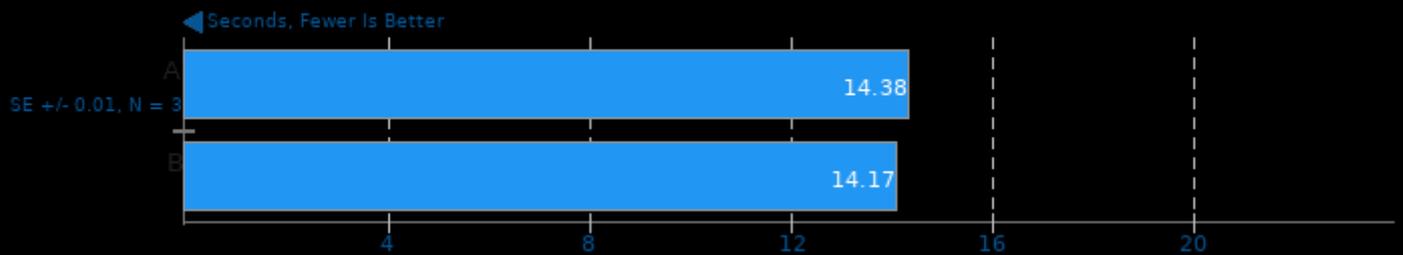
Apache Spark 3.3

Row Count: 40000000 - Partitions: 2000 - Repartition Test Time



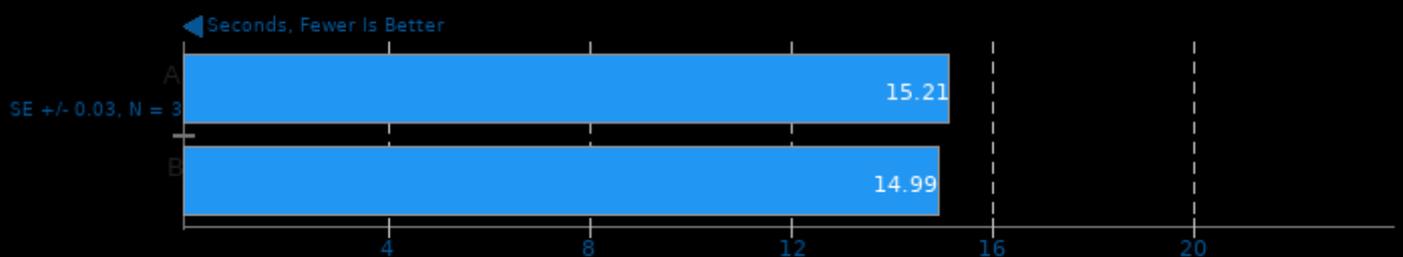
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Row Count: 10000000 - Partitions: 1000 - Repartition Test Time



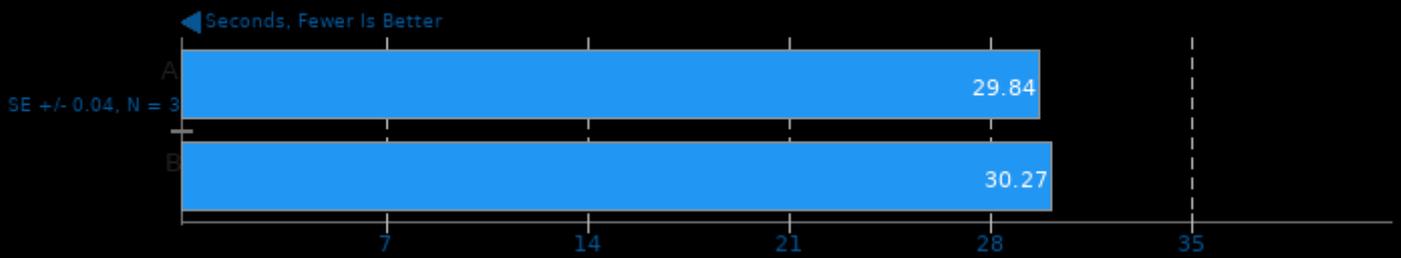
Apache Spark 3.3

Row Count: 10000000 - Partitions: 500 - Broadcast Inner Join Test Time



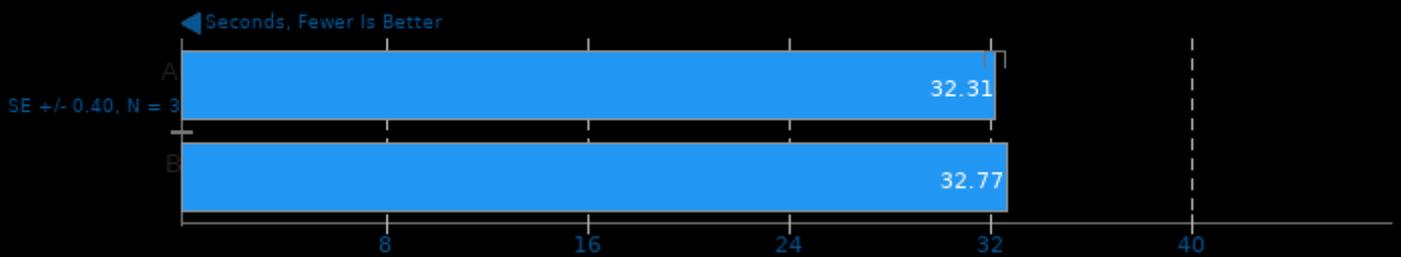
Apache Spark 3.3

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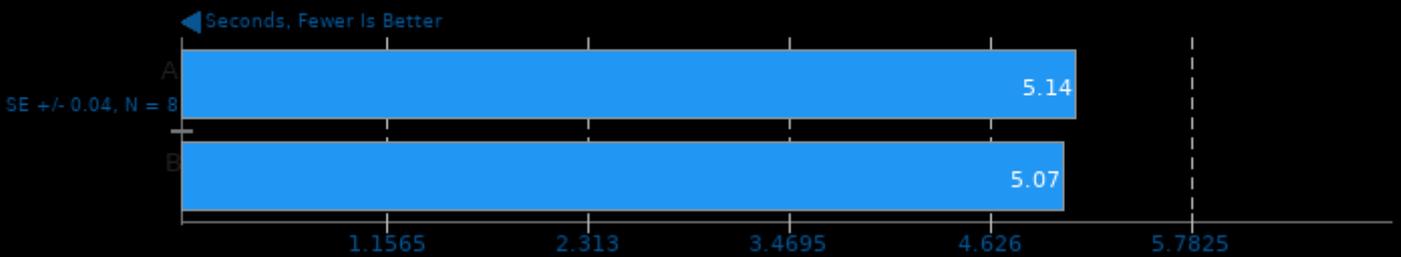
Apache Spark 3.3

Row Count: 20000000 - Partitions: 100 - Inner Join Test Time



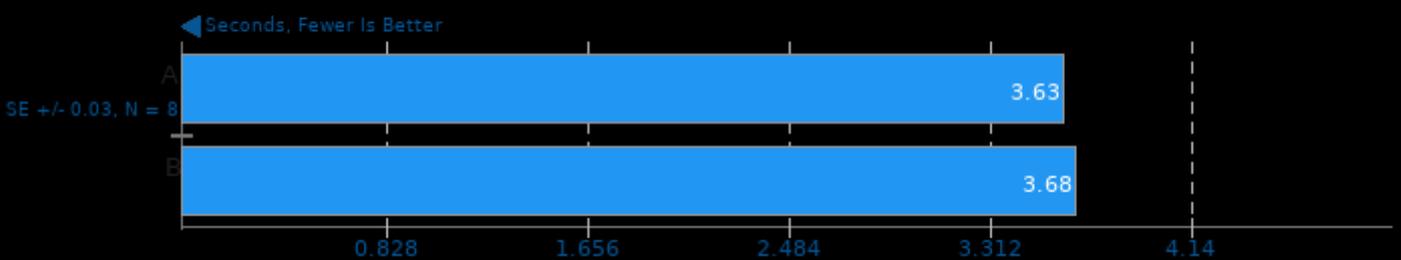
Apache Spark 3.3

Row Count: 1000000 - Partitions: 1000 - Group By Test Time



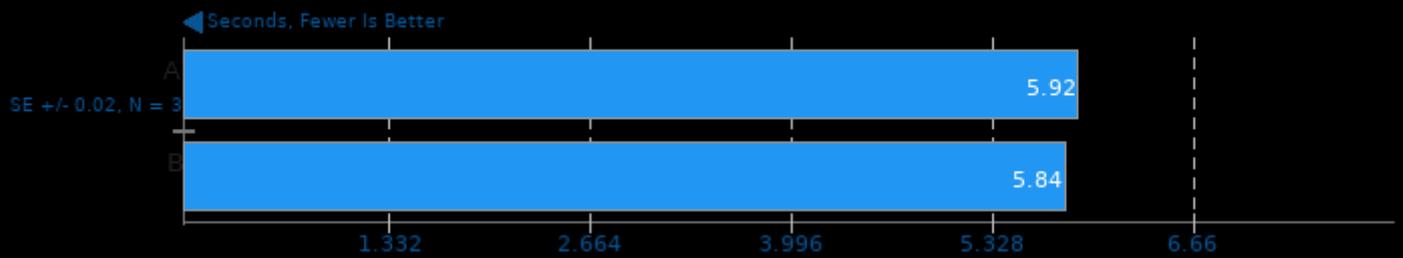
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Row Count: 1000000 - Partitions: 1000 - Repartition Test Time



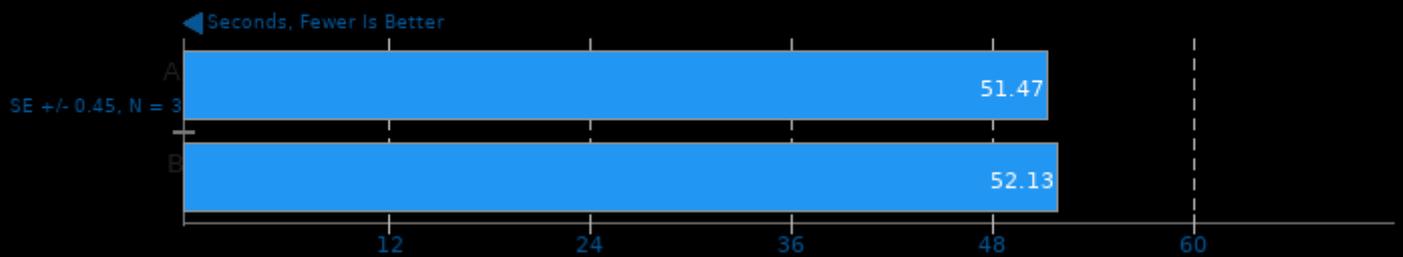
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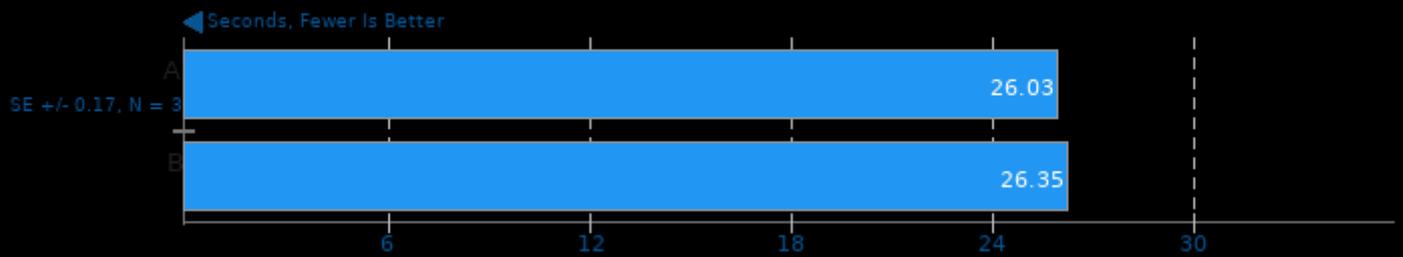
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Row Count: 40000000 - Partitions: 100 - Repartition Test Time



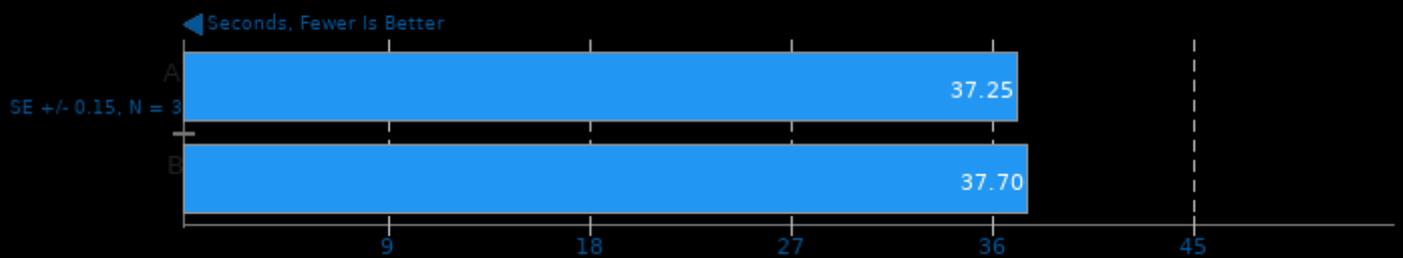
Apache Spark 3.3

Row Count: 20000000 - Partitions: 1000 - Repartition Test Time



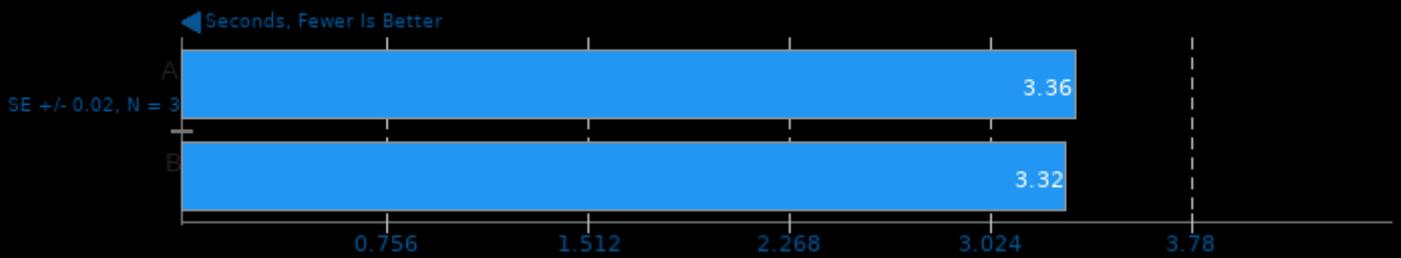
Apache Spark 3.3

Row Count: 20000000 - Partitions: 500 - SHA-512 Benchmark Time



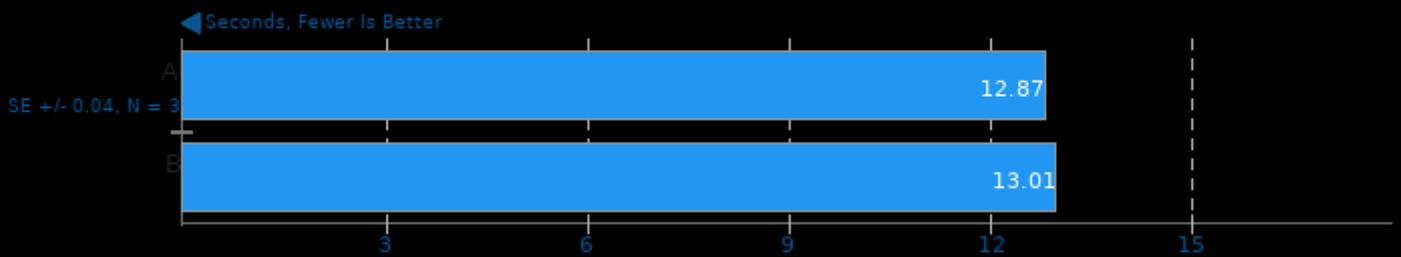
Apache Spark 3.3

Row Count: 1000000 - Partitions: 500 - Repartition Test Time



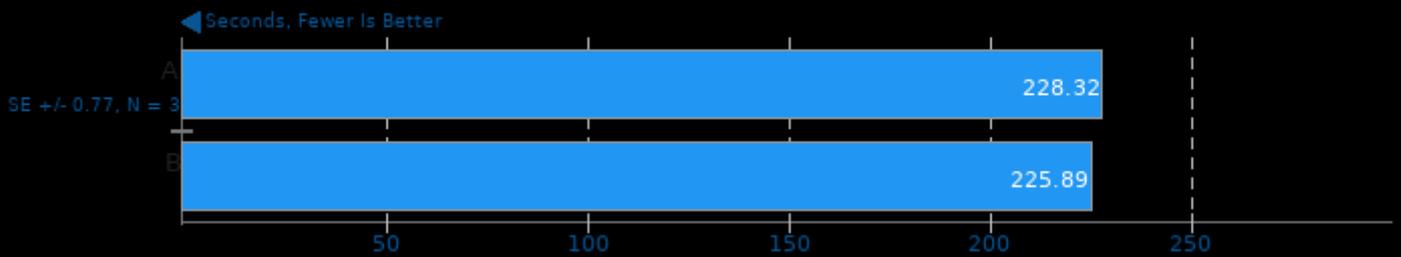
Apache Spark 3.3

Row Count: 20000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe



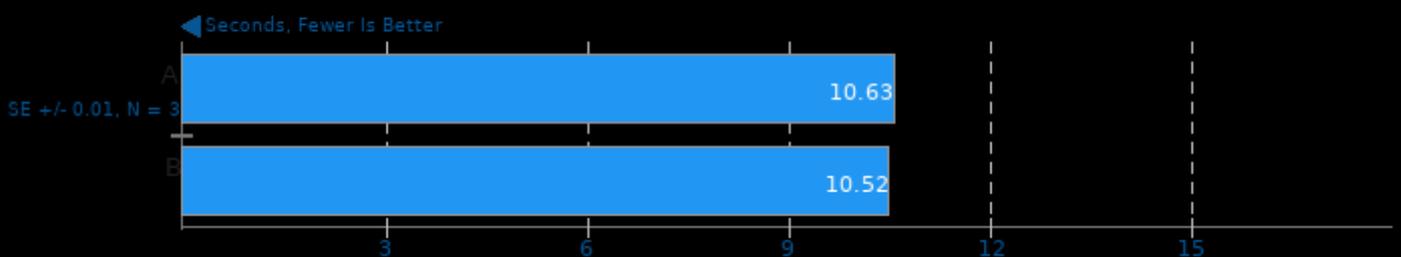
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Row Count: 10000000 - Partitions: 500 - Calculate Pi Benchmark



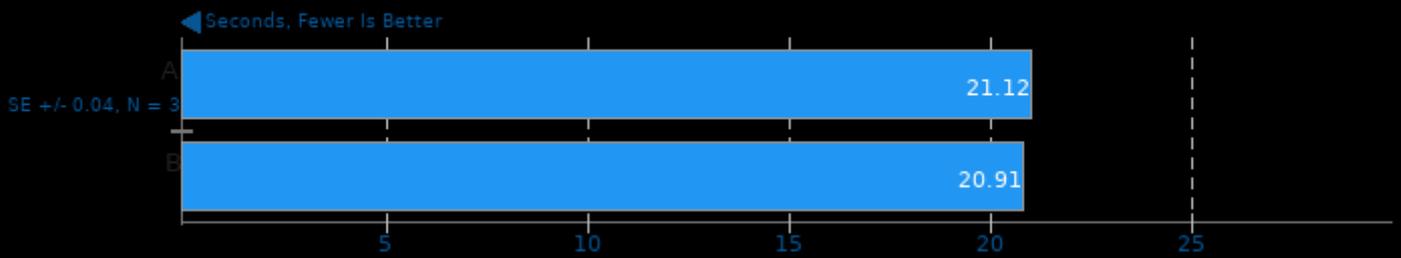
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Row Count: 10000000 - Partitions: 2000 - Group By Test Time



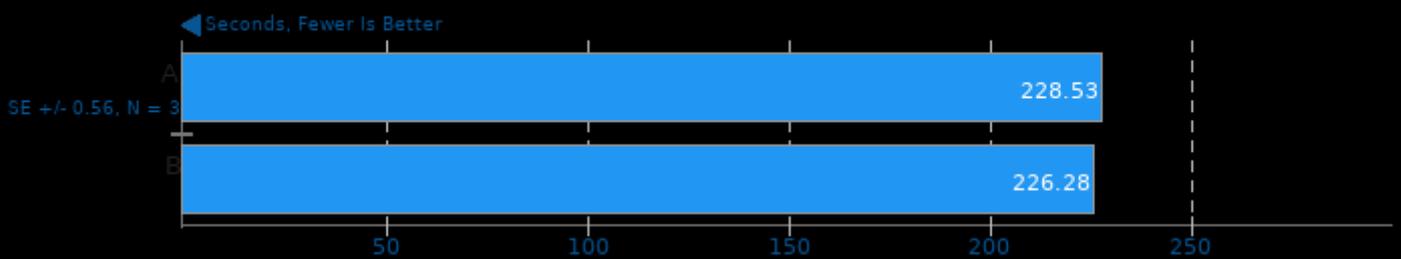
Apache Spark 3.3

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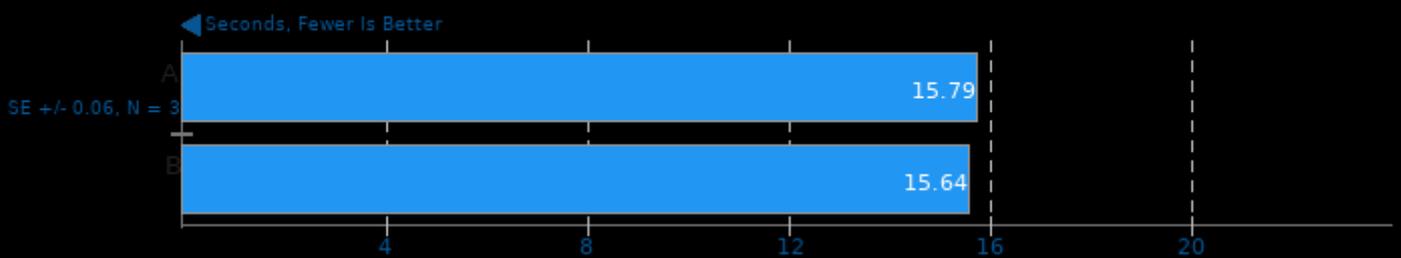
Apache Spark 3.3

Row Count: 40000000 - Partitions: 1000 - Calculate Pi Benchmark



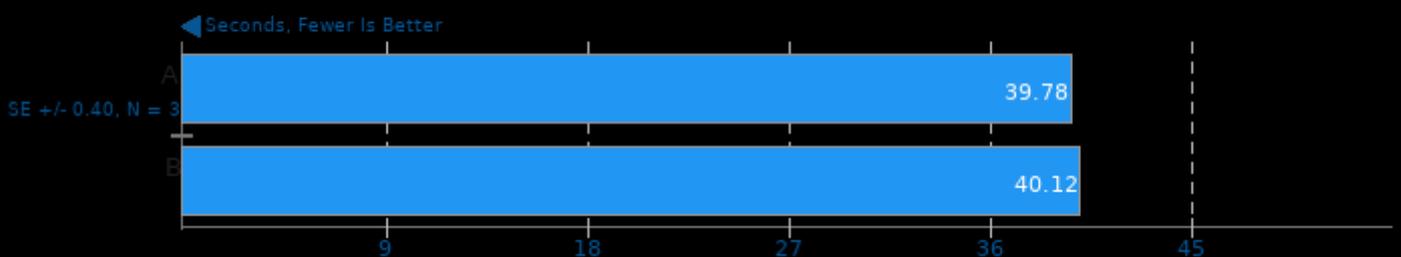
Apache Spark 3.3

Row Count: 10000000 - Partitions: 2000 - Broadcast Inner Join Test Time



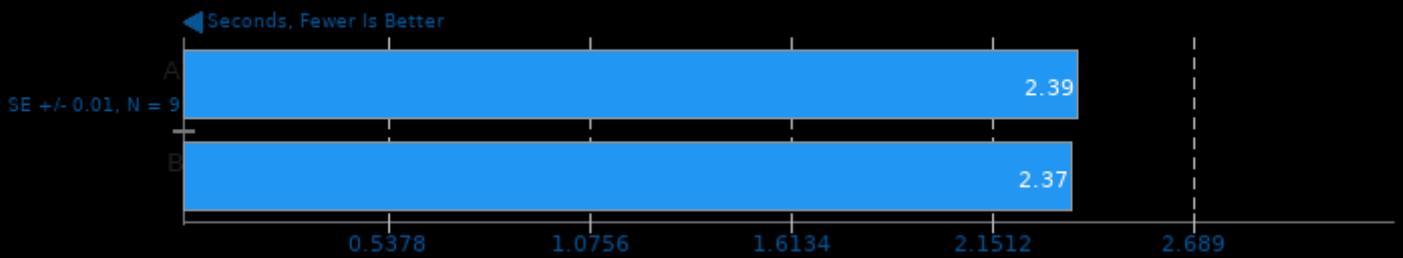
Apache Spark 3.3

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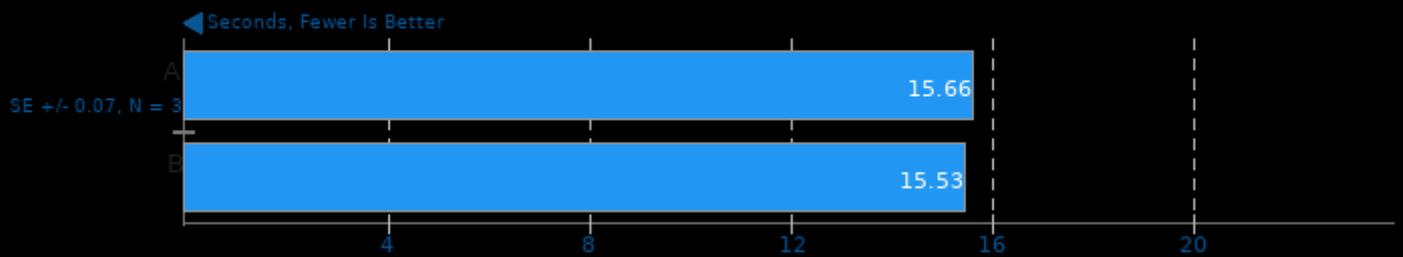
Apache Spark 3.3

Row Count: 1000000 - Partitions: 100 - Inner Join Test Time



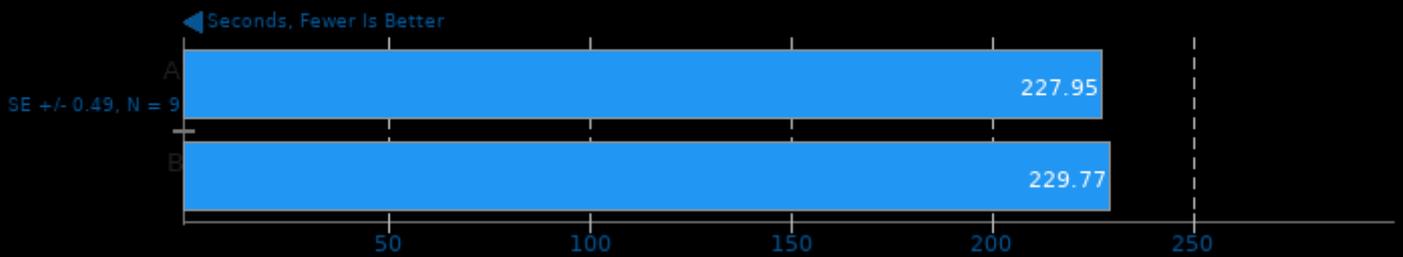
Apache Spark 3.3

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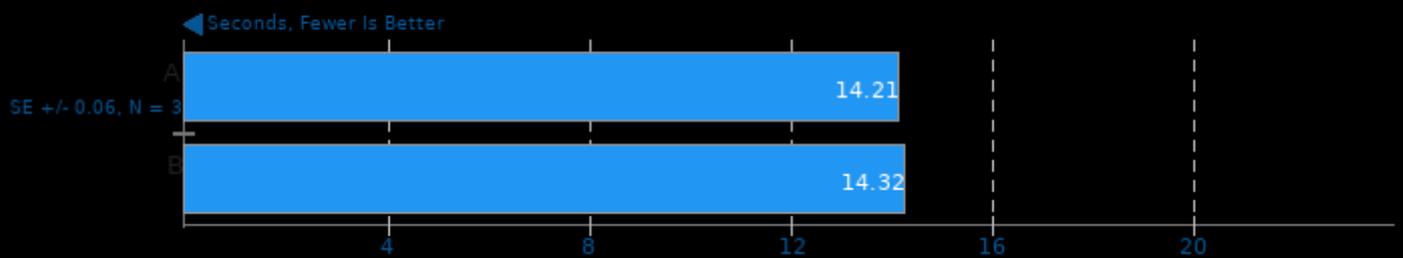
Apache Spark 3.3

Row Count: 1000000 - Partitions: 100 - Calculate Pi Benchmark



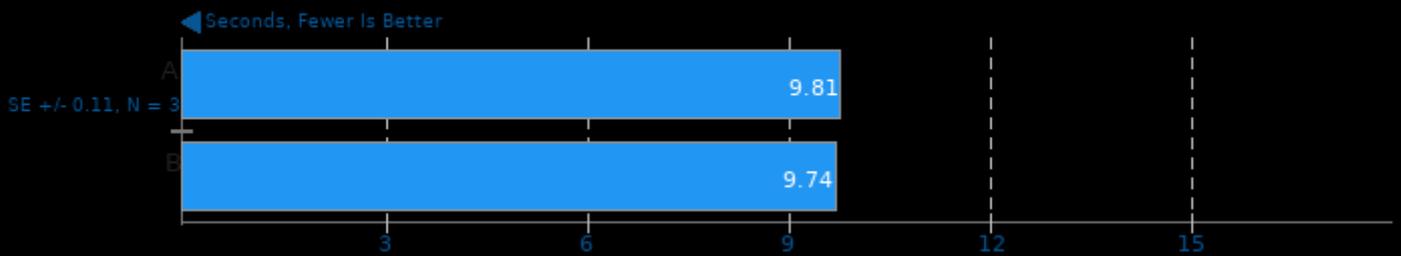
Apache Spark 3.3

Row Count: 10000000 - Partitions: 500 - Repartition Test Time



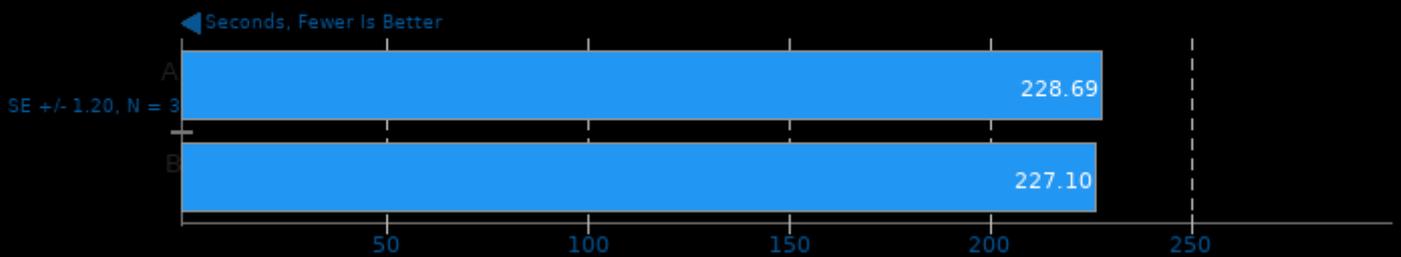
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Row Count: 10000000 - Partitions: 500 - Group By Test Time



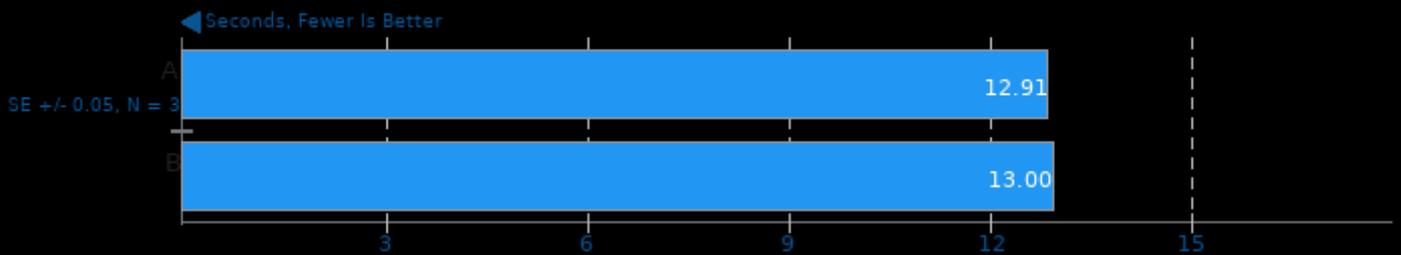
Apache Spark 3.3

Row Count: 10000000 - Partitions: 1000 - Calculate Pi Benchmark



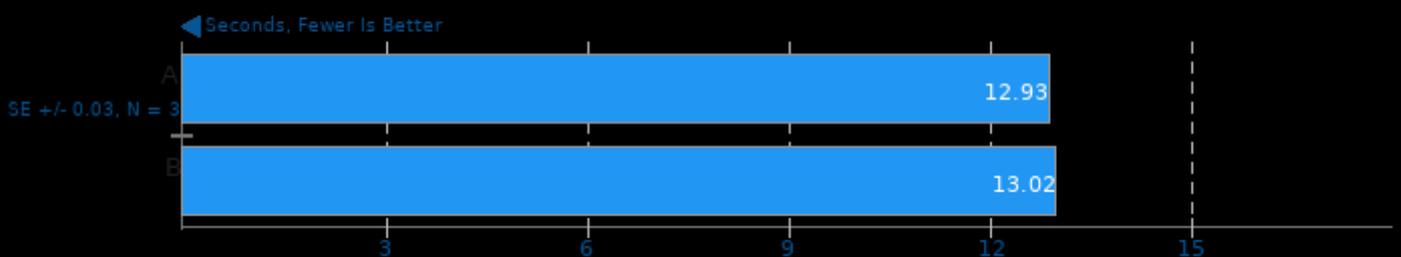
Apache Spark 3.3

Row Count: 1000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe



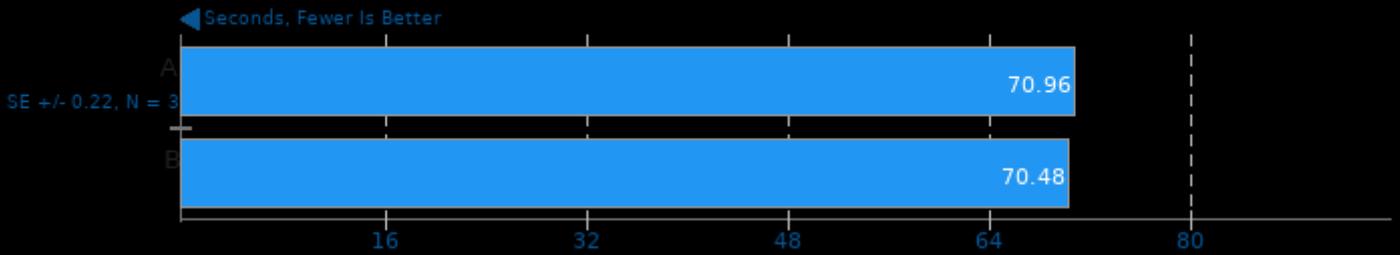
Apache Spark 3.3

Row Count: 10000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe



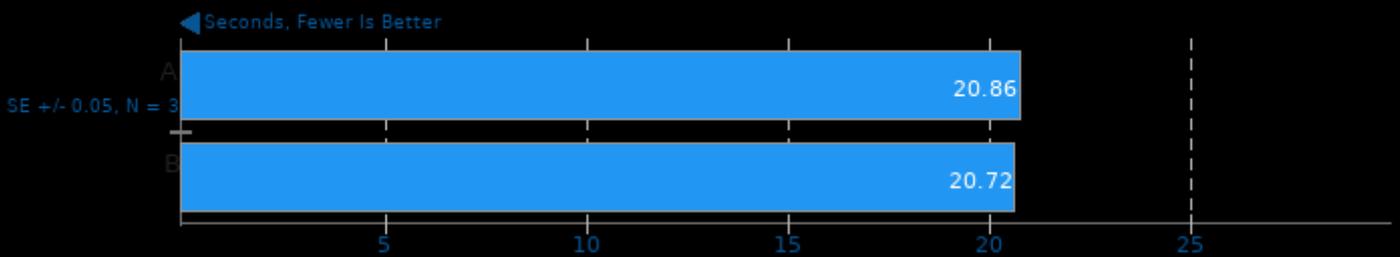
Apache Spark 3.3

Row Count: 40000000 - Partitions: 100 - SHA-512 Benchmark Time



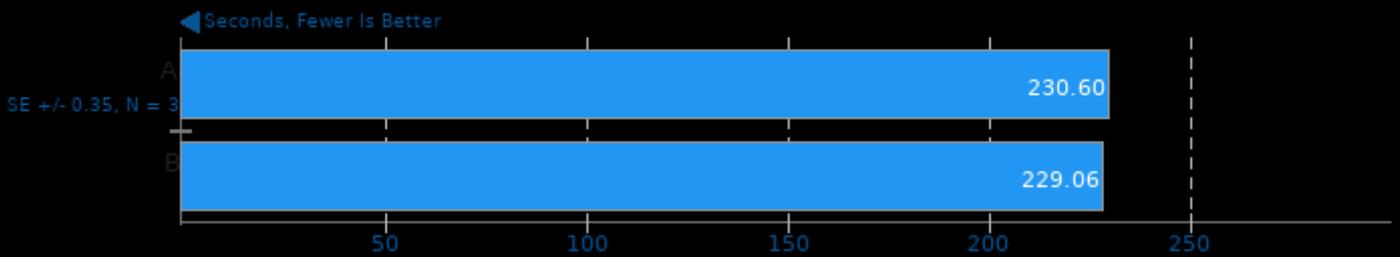
Apache Spark 3.3

Row Count: 10000000 - Partitions: 1000 - SHA-512 Benchmark Time



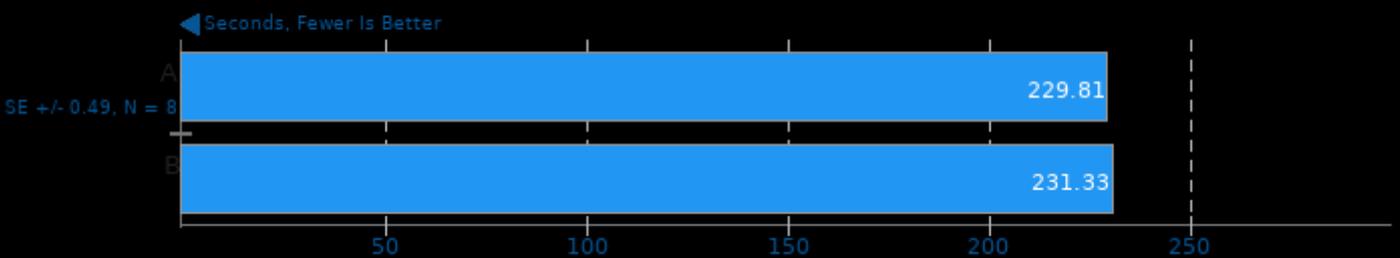
Apache Spark 3.3

Row Count: 20000000 - Partitions: 1000 - Calculate Pi Benchmark



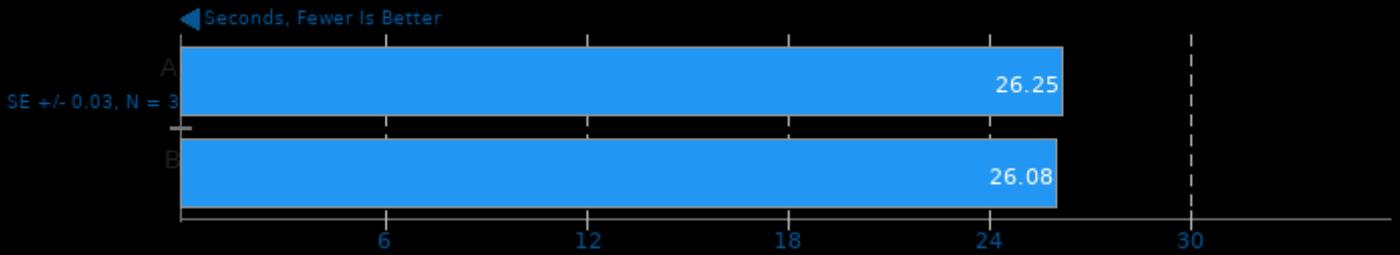
Apache Spark 3.3

Row Count: 1000000 - Partitions: 1000 - Calculate Pi Benchmark



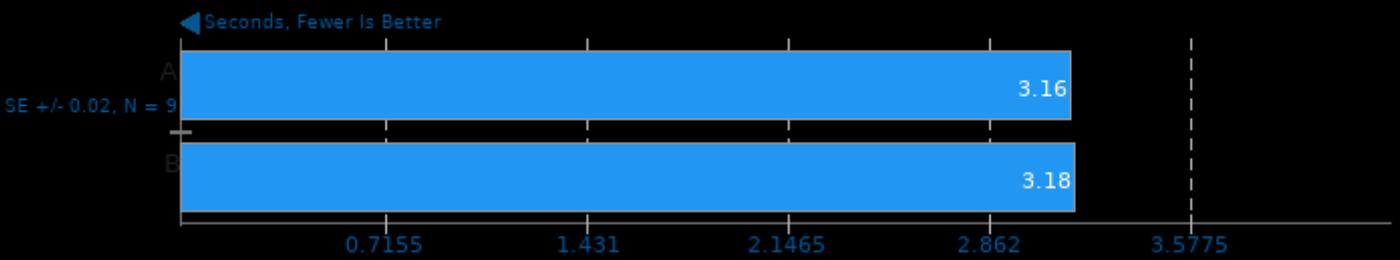
Apache Spark 3.3

Row Count: 20000000 - Partitions: 500 - Repartition Test Time



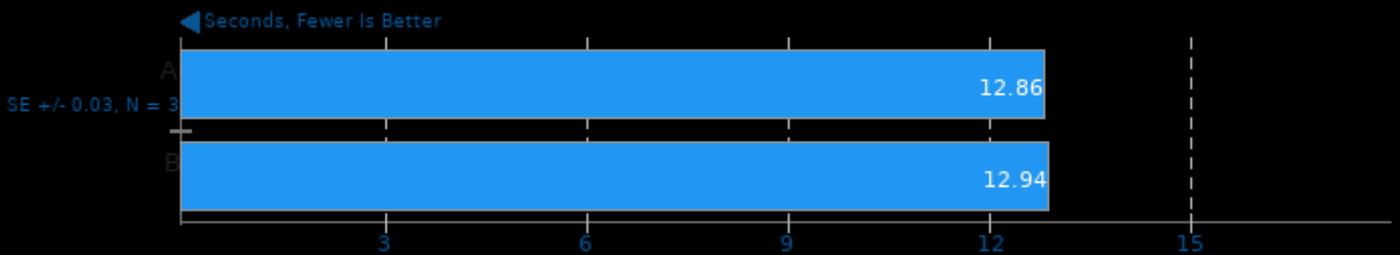
Apache Spark 3.3

Row Count: 1000000 - Partitions: 100 - Repartition Test Time



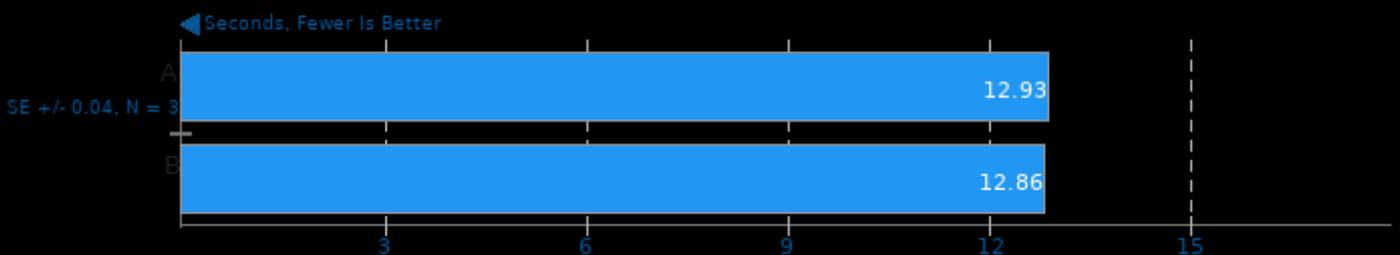
Apache Spark 3.3

Row Count: 40000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe



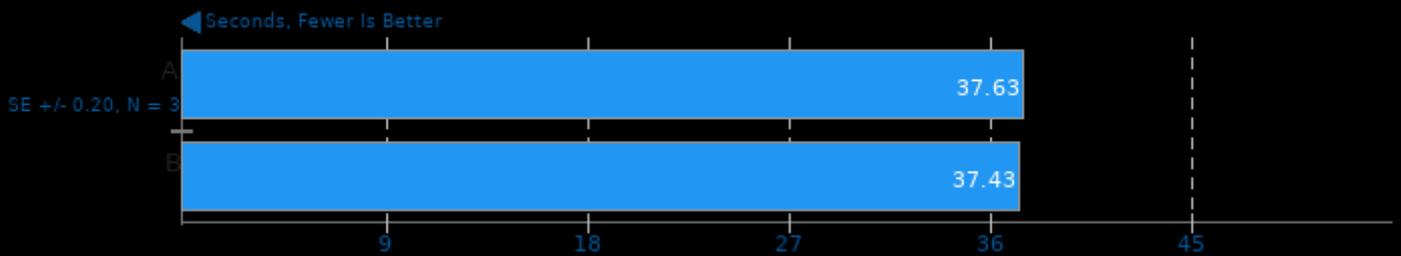
Apache Spark 3.3

Row Count: 40000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe



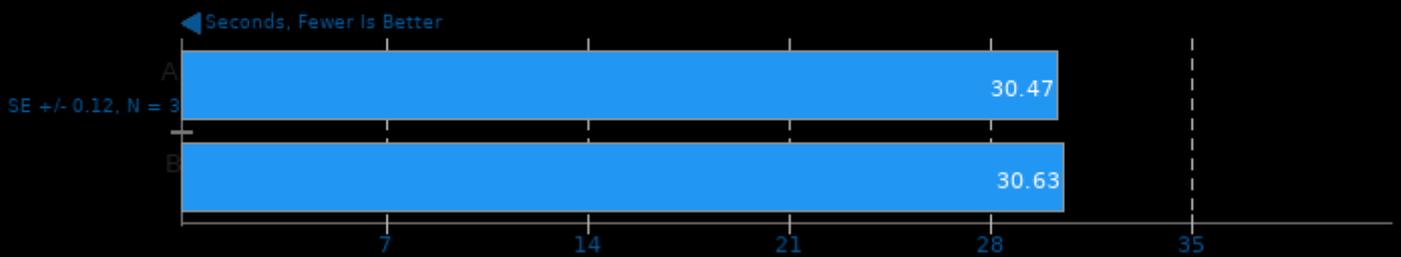
Apache Spark 3.3

Row Count: 20000000 - Partitions: 1000 - SHA-512 Benchmark Time



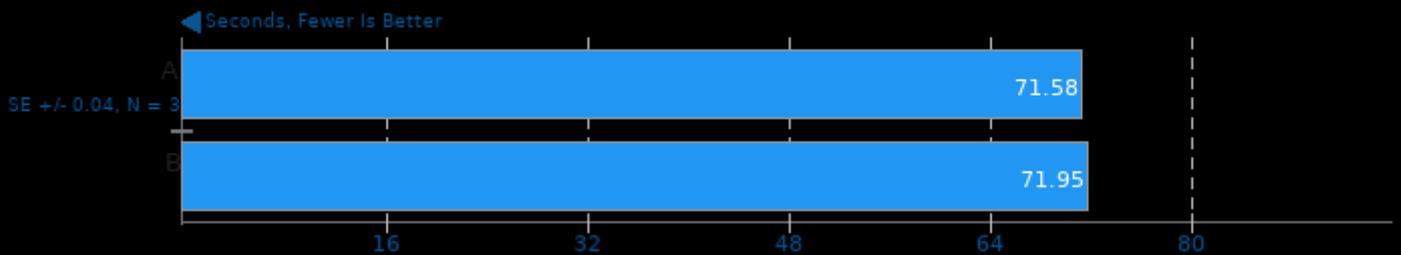
Apache Spark 3.3

Row Count: 20000000 - Partitions: 2000 - Inner Join Test Time



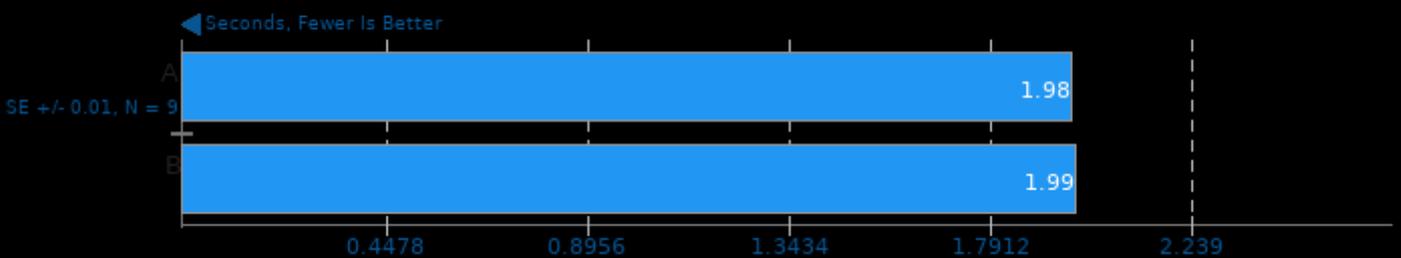
Apache Spark 3.3

Row Count: 40000000 - Partitions: 2000 - SHA-512 Benchmark Time



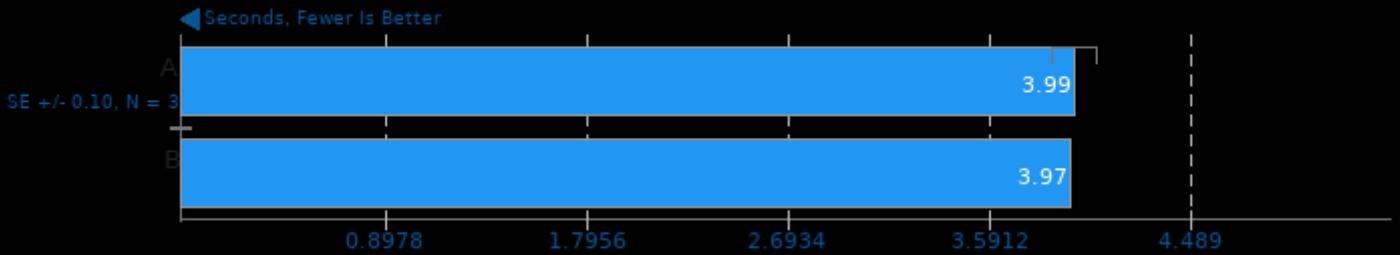
Apache Spark 3.3

Row Count: 1000000 - Partitions: 100 - Broadcast Inner Join Test Time



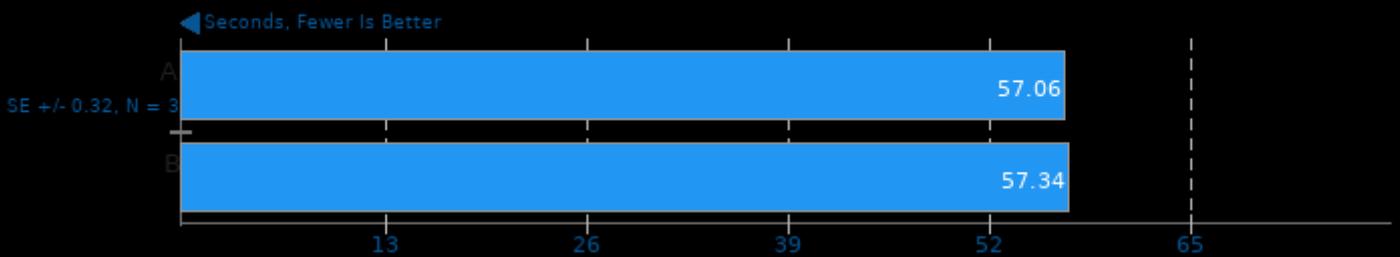
Apache Spark 3.3

Row Count: 1000000 - Partitions: 2000 - Inner Join Test Time



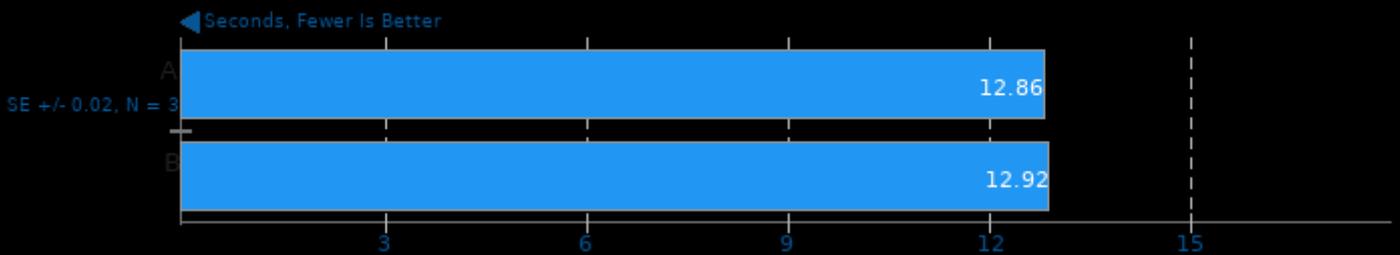
Apache Spark 3.3

Row Count: 40000000 - Partitions: 100 - Broadcast Inner Join Test Time



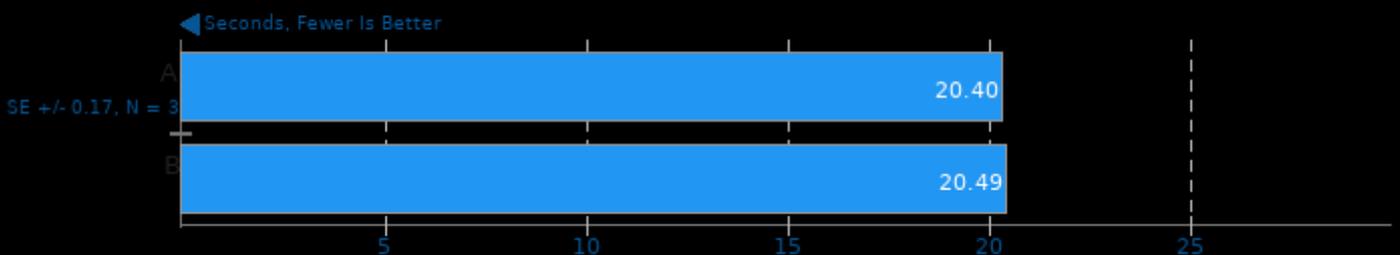
Apache Spark 3.3

Row Count: 20000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe



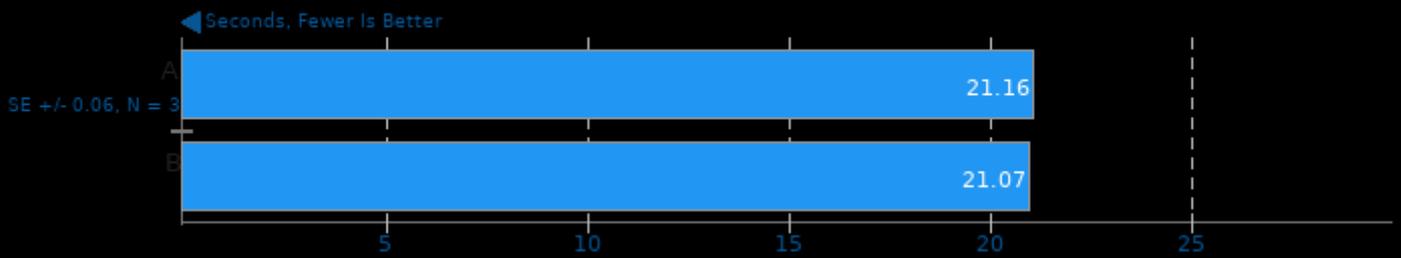
Apache Spark 3.3

Row Count: 10000000 - Partitions: 500 - SHA-512 Benchmark Time



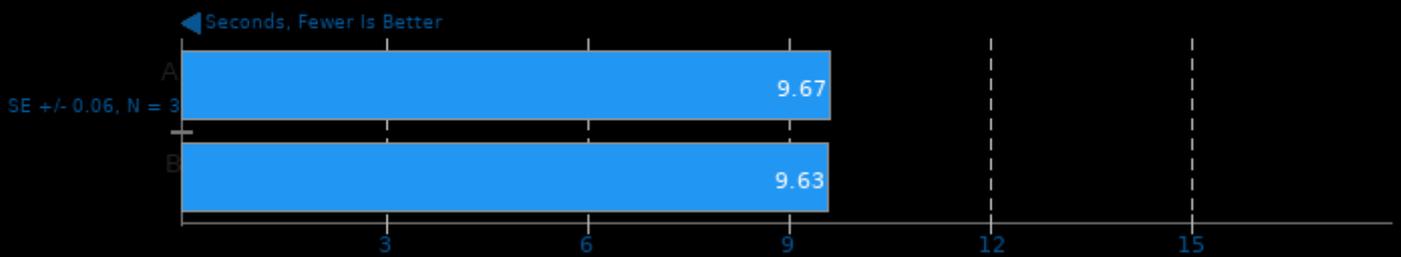
Apache Spark 3.3

Row Count: 10000000 - Partitions: 2000 - SHA-512 Benchmark Time



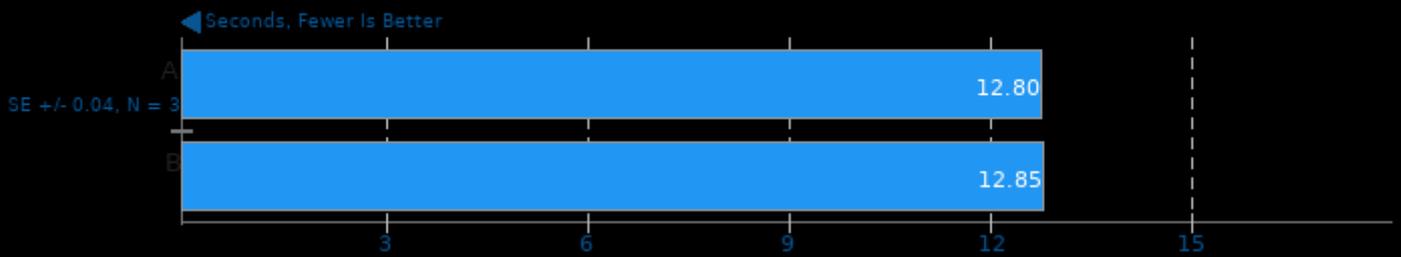
Apache Spark 3.3

Row Count: 10000000 - Partitions: 100 - Group By Test Time



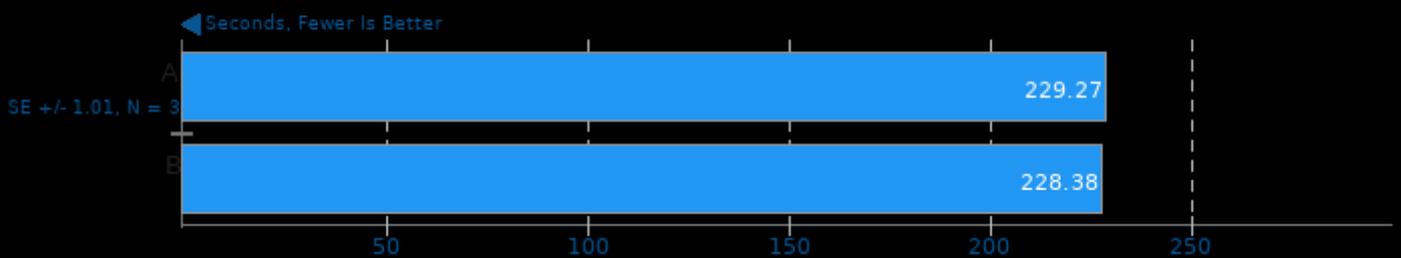
Apache Spark 3.3

Row Count: 40000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe



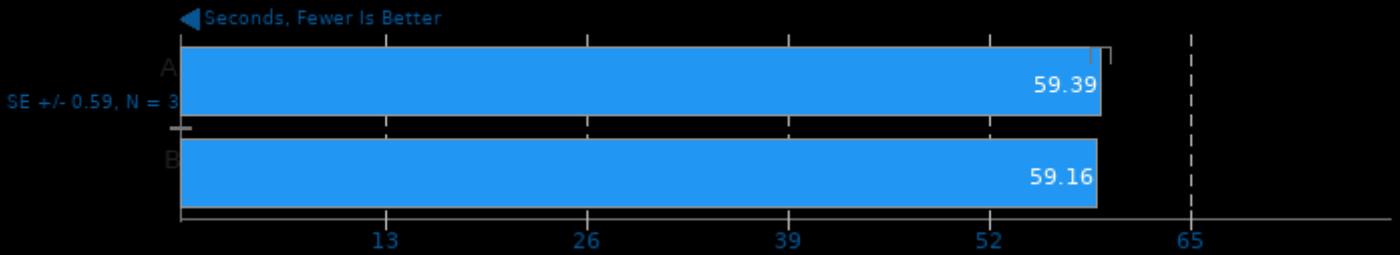
Apache Spark 3.3

Row Count: 20000000 - Partitions: 100 - Calculate Pi Benchmark



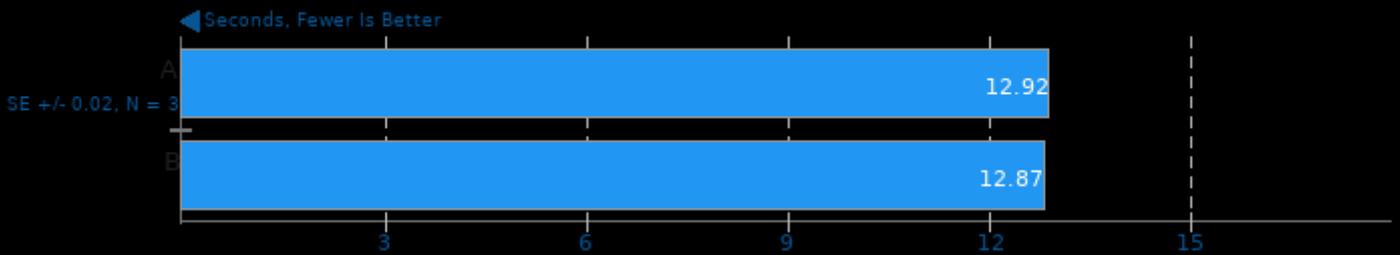
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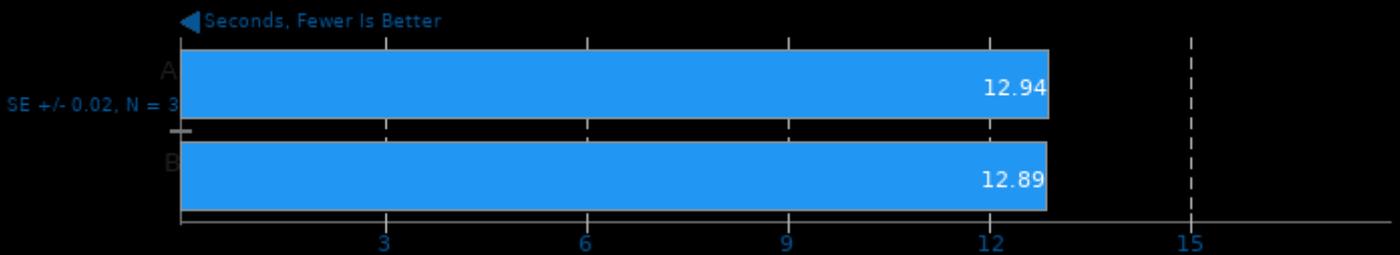
Apache Spark 3.3

Row Count: 40000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe



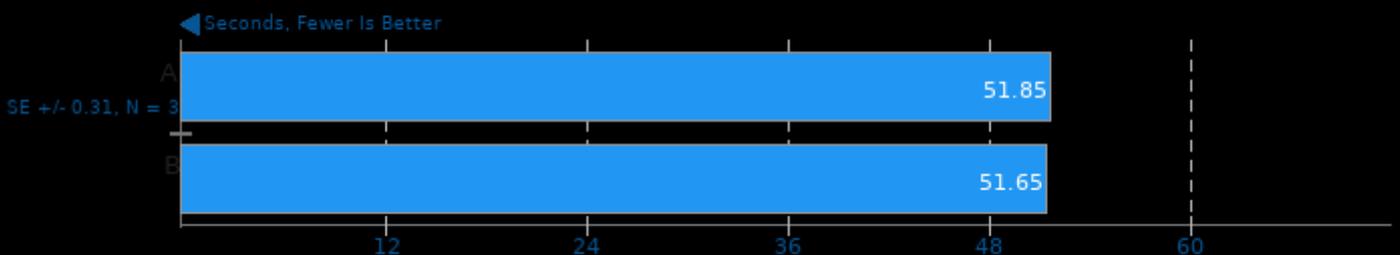
Apache Spark 3.3

Row Count: 1000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe



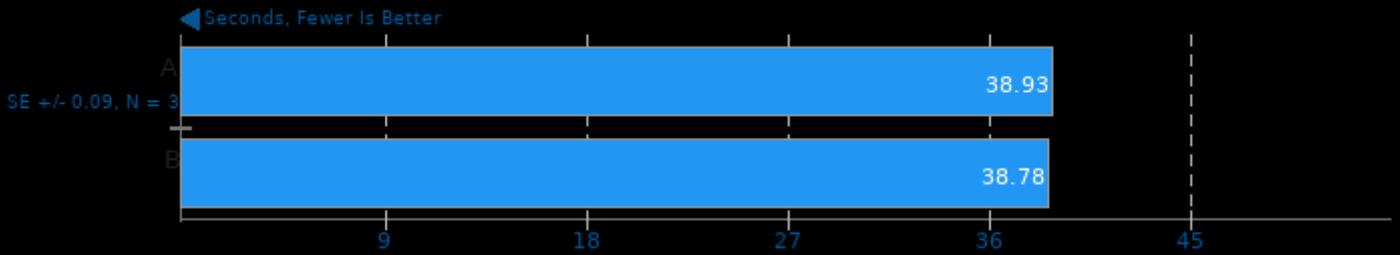
Apache Spark 3.3

Row Count: 40000000 - Partitions: 500 - Repartition Test Time



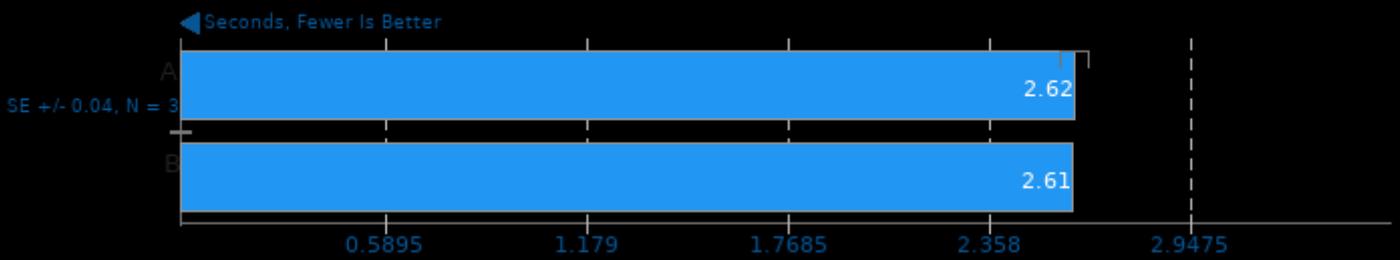
Apache Spark 3.3

Row Count: 20000000 - Partitions: 100 - SHA-512 Benchmark Time



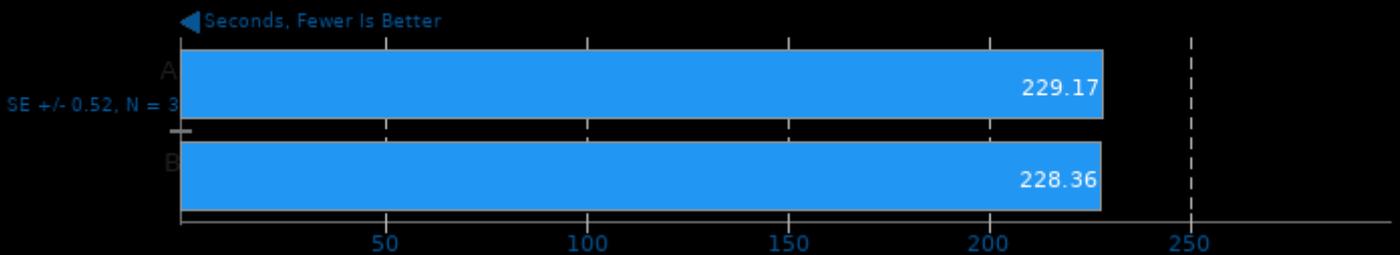
Apache Spark 3.3

Row Count: 1000000 - Partitions: 500 - Inner Join Test Time



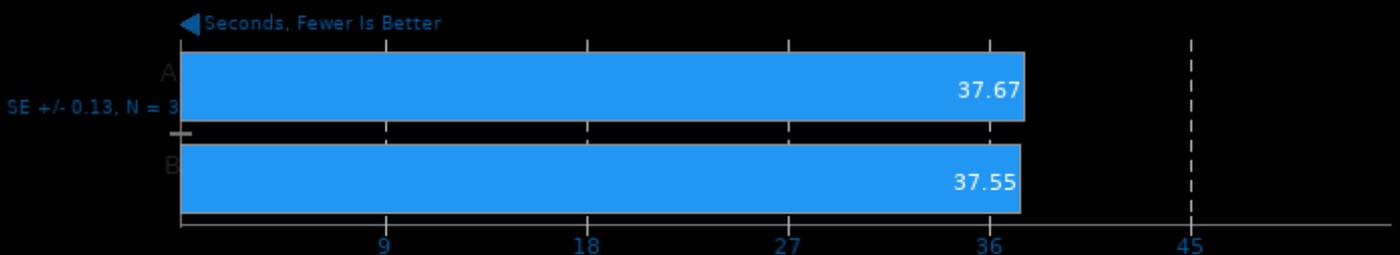
Apache Spark 3.3

Row Count: 10000000 - Partitions: 100 - Calculate Pi Benchmark



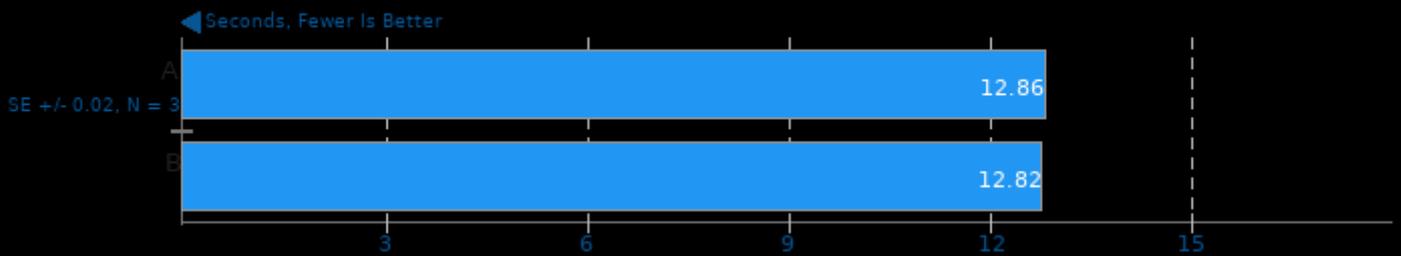
Apache Spark 3.3

Row Count: 20000000 - Partitions: 2000 - SHA-512 Benchmark Time



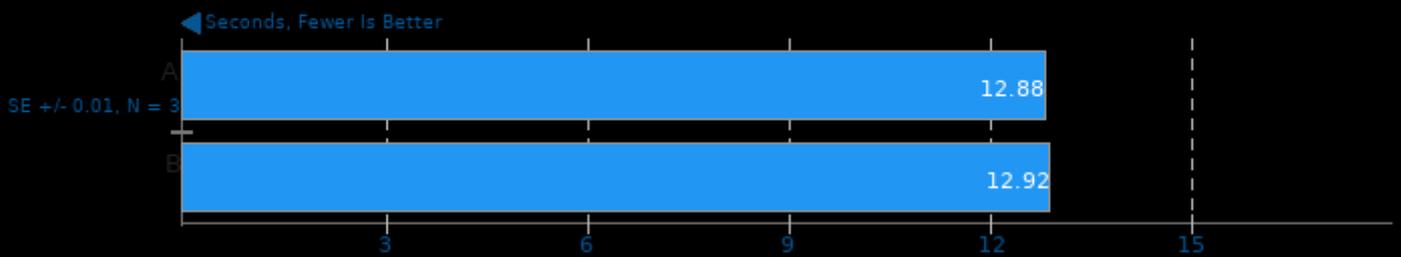
Apache Spark 3.3

Row Count: 10000000 - Partitions: 1000 - Calculate Pi Benchmark Using Dataframe



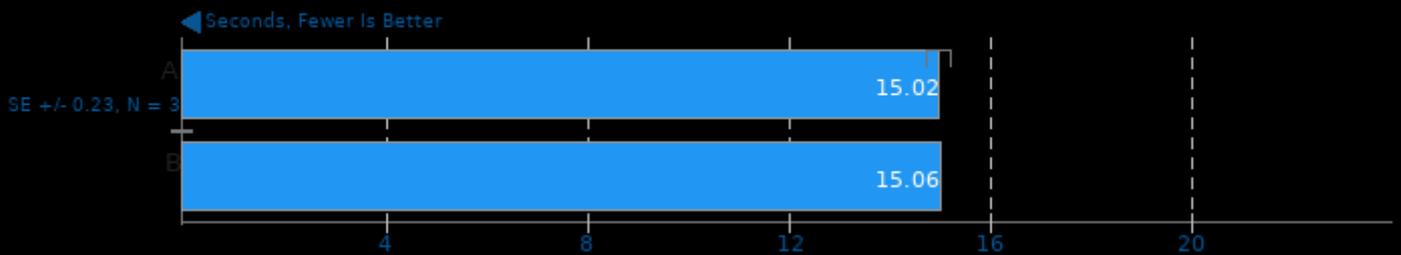
Apache Spark 3.3

Row Count: 10000000 - Partitions: 2000 - Calculate Pi Benchmark Using Dataframe



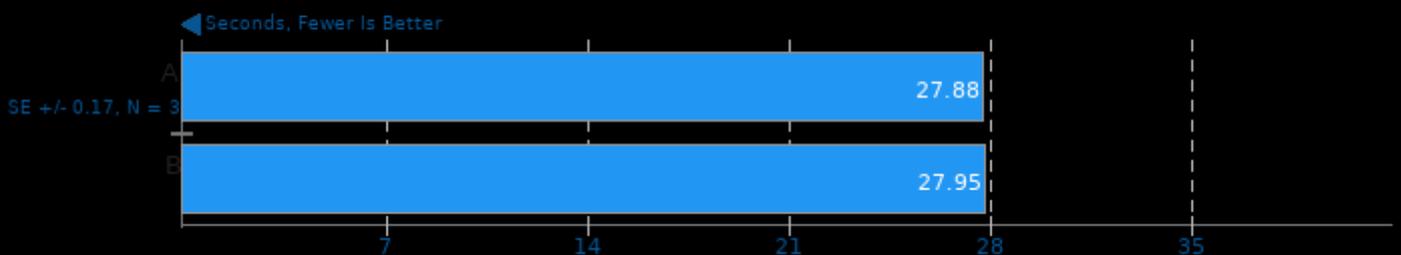
Apache Spark 3.3

Row Count: 20000000 - Partitions: 500 - Group By Test Time



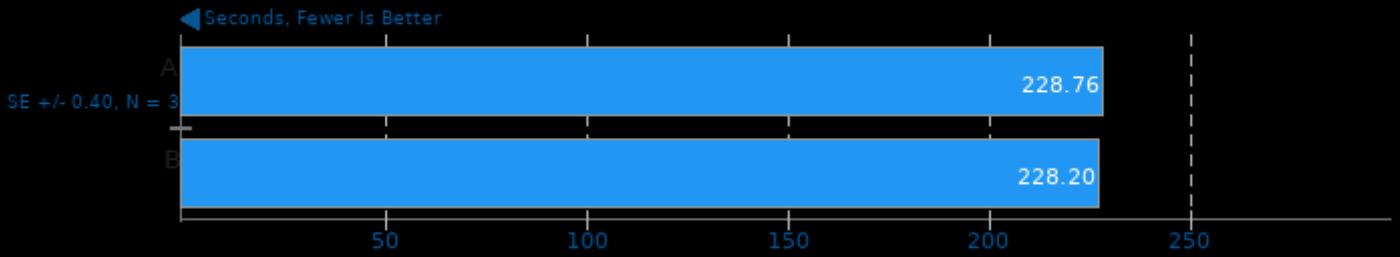
Apache Spark 3.3

Row Count: 20000000 - Partitions: 100 - Repartition Test Time



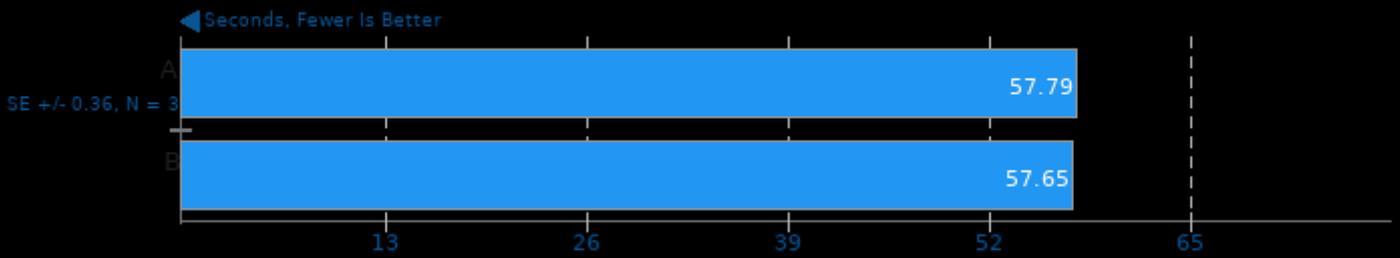
Apache Spark 3.3

Row Count: 40000000 - Partitions: 100 - Calculate Pi Benchmark



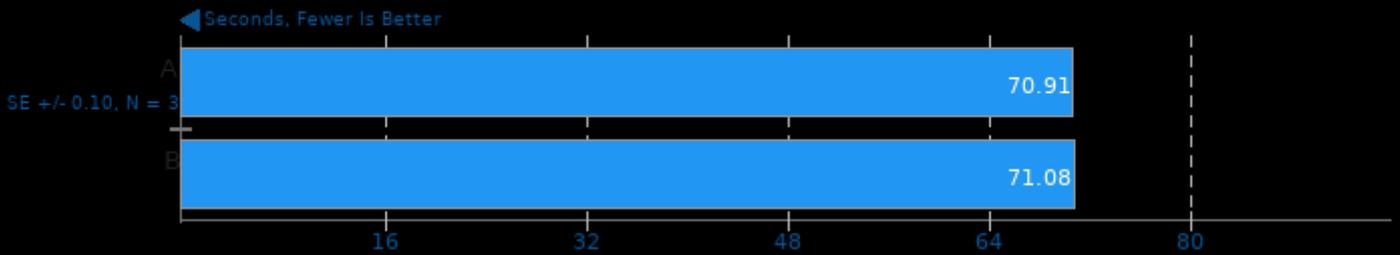
Apache Spark 3.3

Row Count: 40000000 - Partitions: 500 - Broadcast Inner Join Test Time



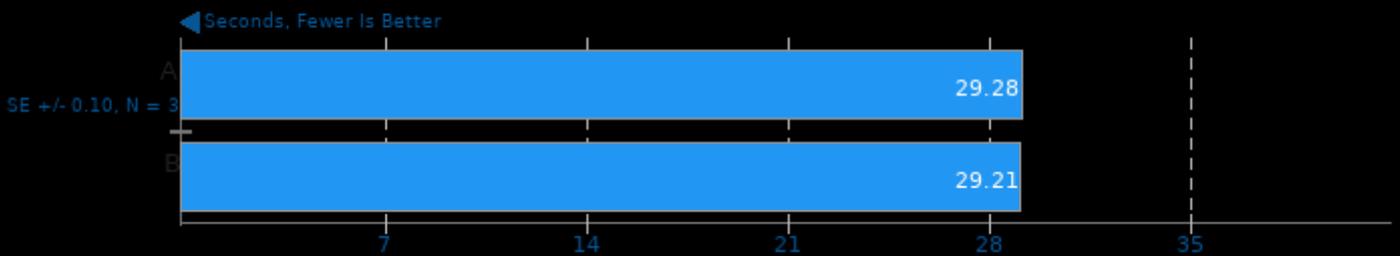
Apache Spark 3.3

Row Count: 40000000 - Partitions: 500 - SHA-512 Benchmark Time



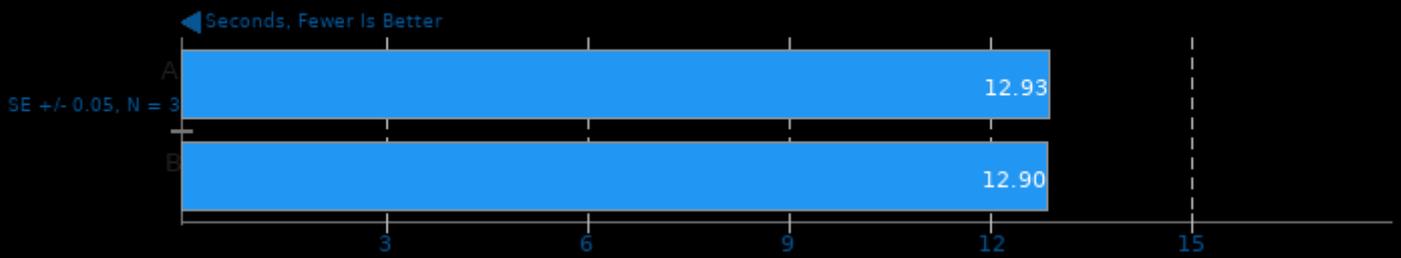
Apache Spark 3.3

Row Count: 20000000 - Partitions: 2000 - Broadcast Inner Join Test Time



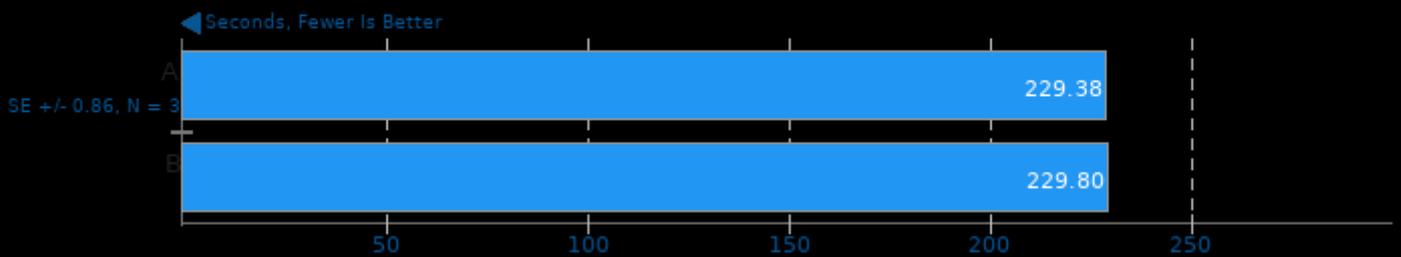
Apache Spark 3.3

Row Count: 10000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe



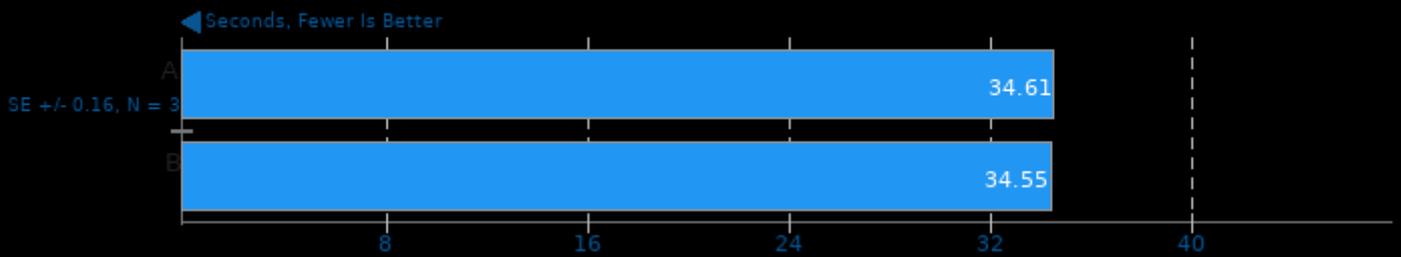
Apache Spark 3.3

Row Count: 40000000 - Partitions: 2000 - Calculate Pi Benchmark



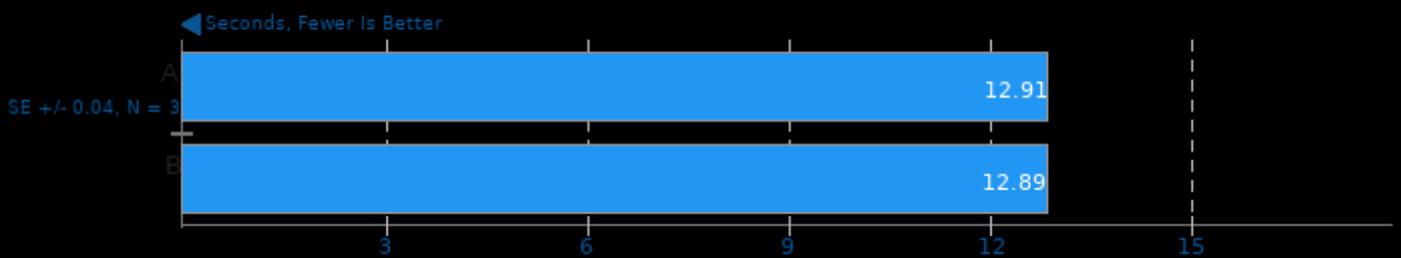
Apache Spark 3.3

Row Count: 40000000 - Partitions: 2000 - Group By Test Time



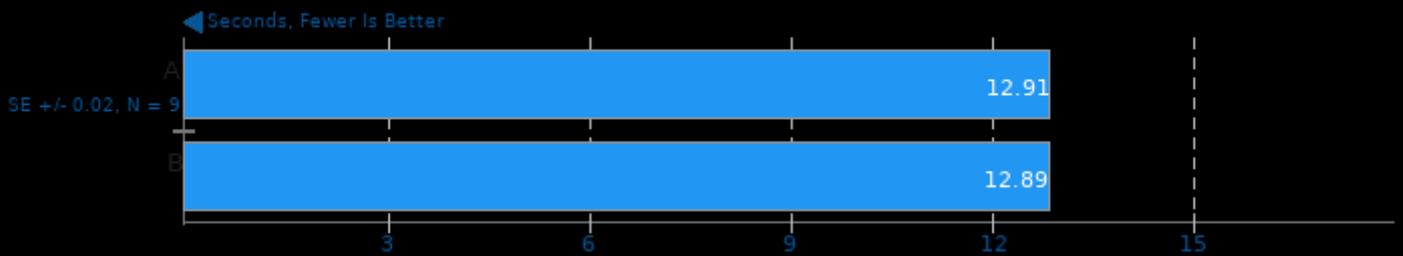
Apache Spark 3.3

Row Count: 20000000 - Partitions: 500 - Calculate Pi Benchmark Using Dataframe



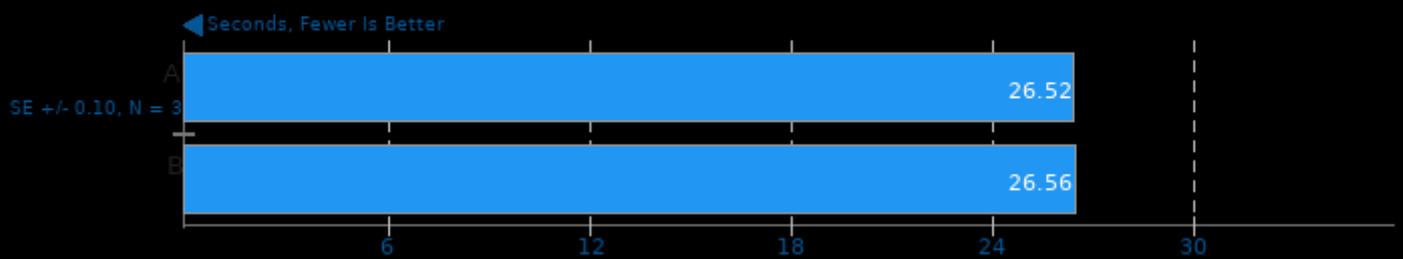
Apache Spark 3.3

Row Count: 1000000 - Partitions: 100 - Calculate Pi Benchmark Using Dataframe



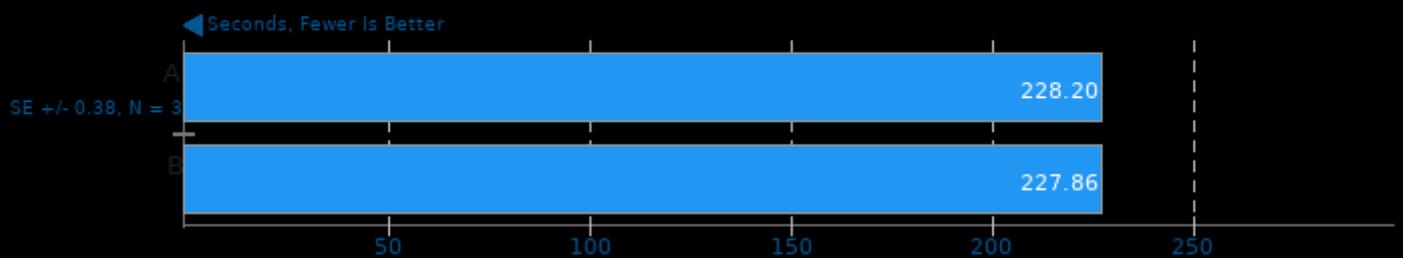
Apache Spark 3.3

Row Count: 20000000 - Partitions: 2000 - Repartition Test Time



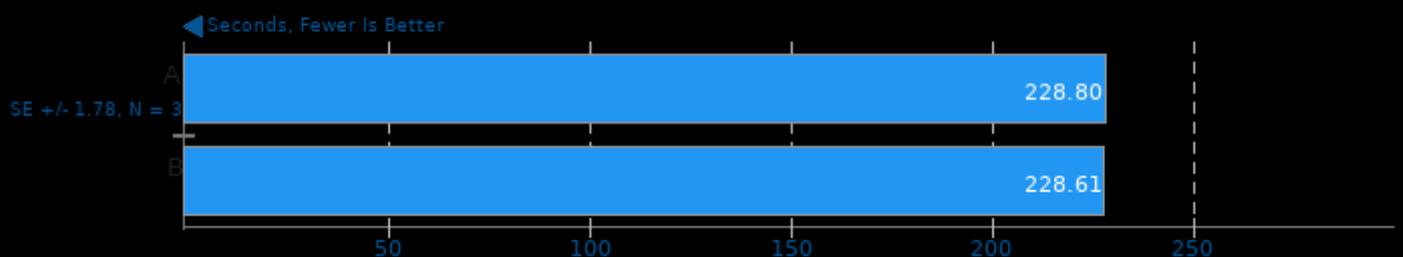
Apache Spark 3.3

Row Count: 20000000 - Partitions: 500 - Calculate Pi Benchmark



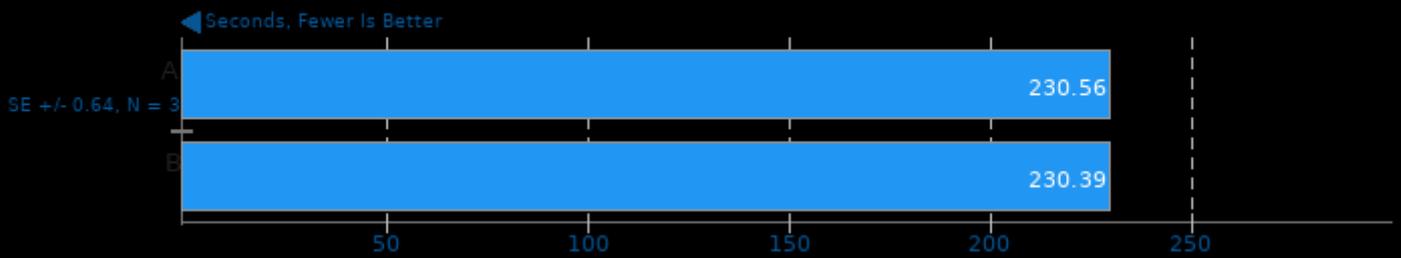
Apache Spark 3.3

Row Count: 1000000 - Partitions: 500 - Calculate Pi Benchmark



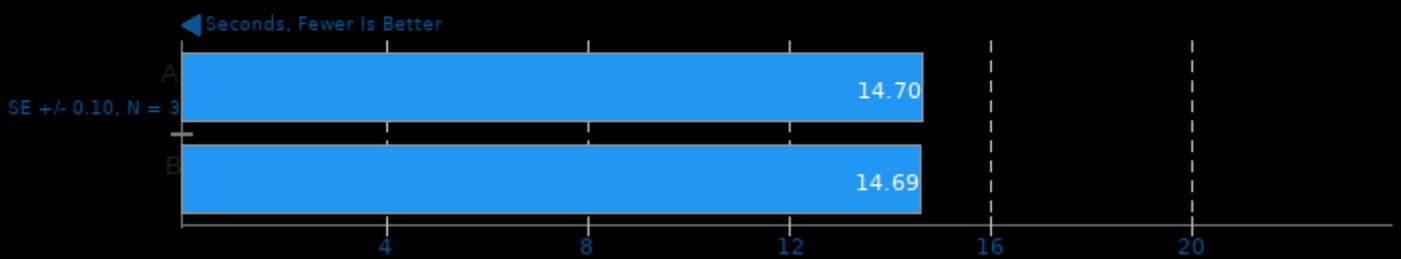
Apache Spark 3.3

Row Count: 20000000 - Partitions: 2000 - Calculate Pi Benchmark



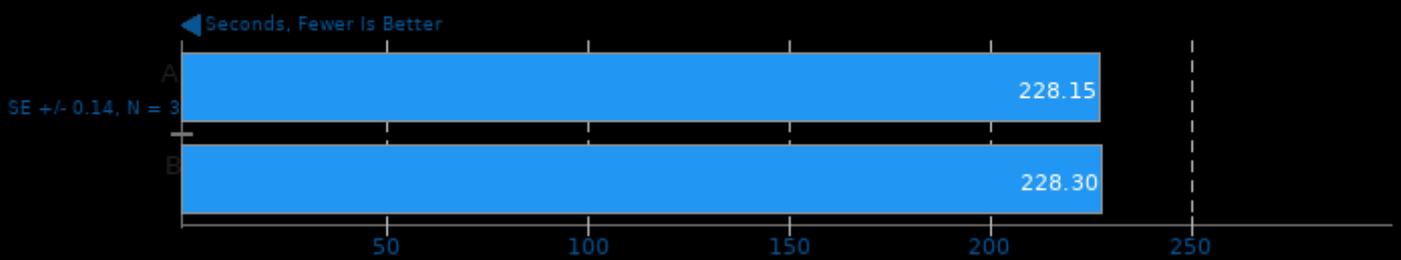
Apache Spark 3.3

Row Count: 10000000 - Partitions: 2000 - Repartition Test Time



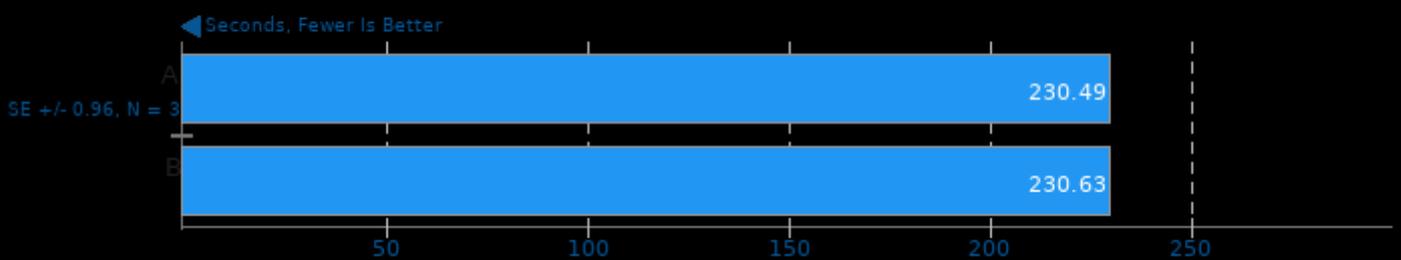
Apache Spark 3.3

Row Count: 10000000 - Partitions: 2000 - Calculate Pi Benchmark



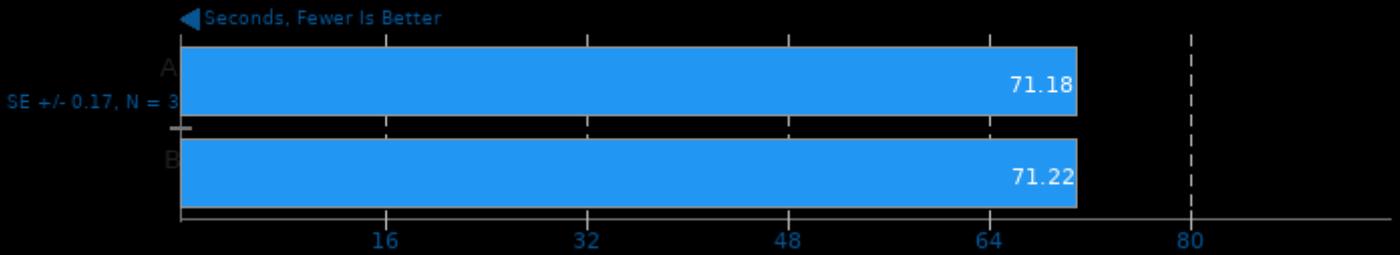
Apache Spark 3.3

Row Count: 40000000 - Partitions: 500 - Calculate Pi Benchmark



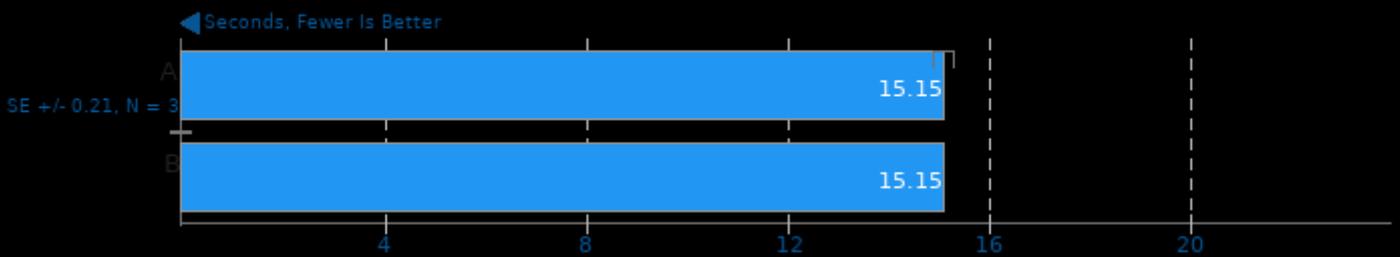
Apache Spark 3.3

Row Count: 40000000 - Partitions: 1000 - SHA-512 Benchmark Time



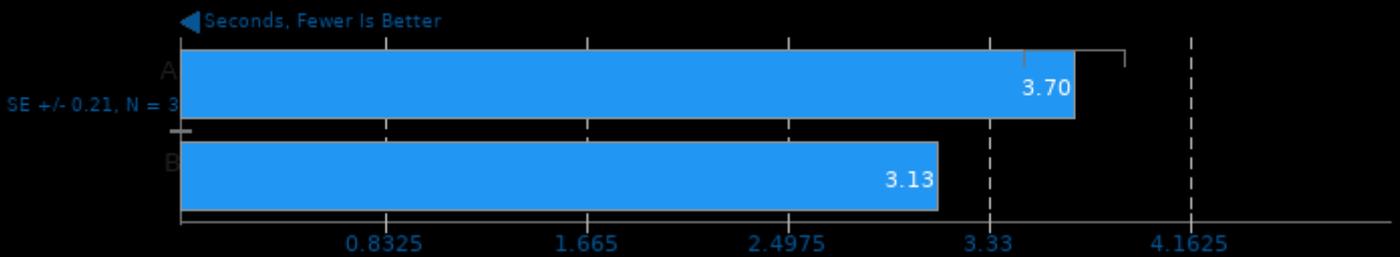
Apache Spark 3.3

Row Count: 20000000 - Partitions: 1000 - Group By Test Time



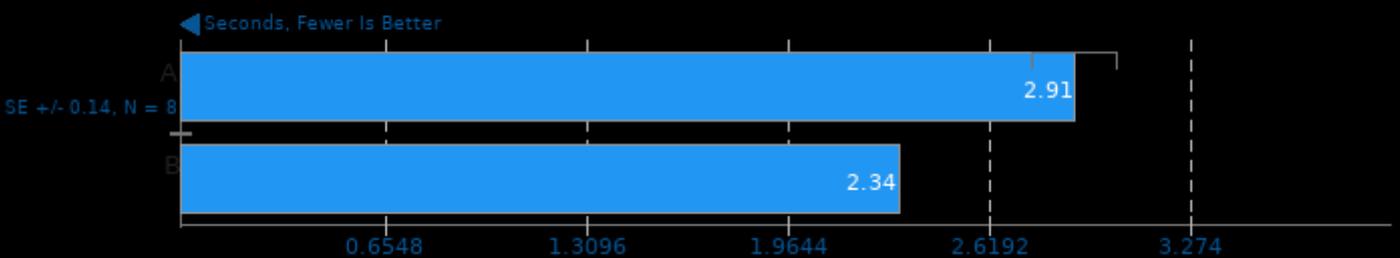
Apache Spark 3.3

Row Count: 1000000 - Partitions: 2000 - Broadcast Inner Join Test Time



Apache Spark 3.3

Row Count: 1000000 - Partitions: 1000 - Broadcast Inner Join Test Time



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