

# IndexedSequences.append

JMH 1.12 (released 183 days ago, please consider updating!)

**VM invoker:** /usr/lib/jvm/java-1.8.0-openjdk-1.8.0.102-1.b14.fc24.x86\_64/jre/bin/java

**VM options:** <none>

**Forks:** 2 forks

**Warmup:** 20 iterations, 1 s each

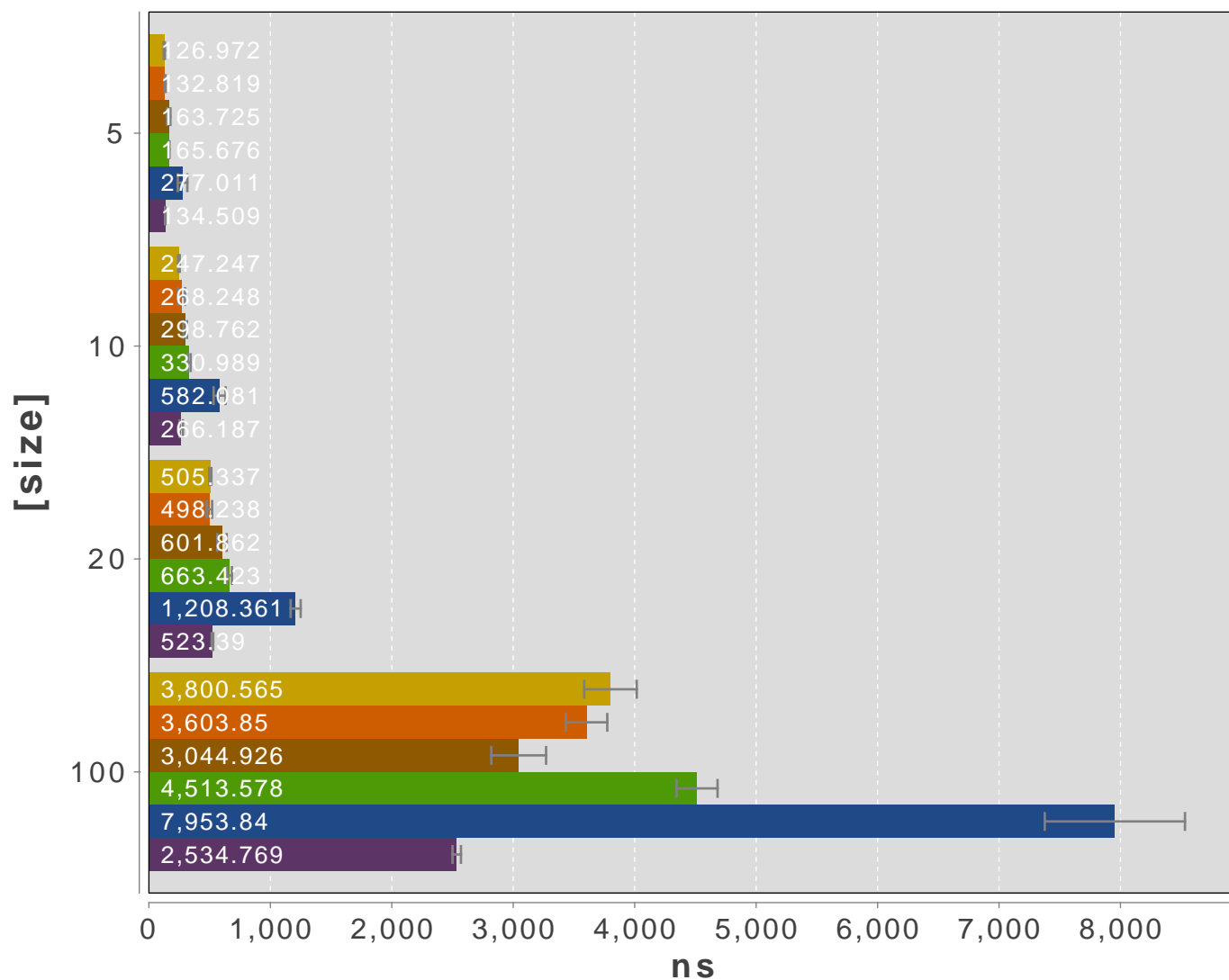
**Measurement:** 10 iterations, 1 s each

**Timeout:** 10 min per iteration

**Threads:** 1 thread, will synchronize iterations

**Benchmark mode:** Average time, time/op

implementation	[size]	Score	Error ( $\pm$ )	Unit
Custom DEX Array	5	126.972	4.285	ns
DEX Array	5	132.819	5.266	ns
DEX Vector	5	163.725	13.470	ns
JavaLang Array	5	165.676	3.625	ns
JavaLang Vector	5	277.011	39.355	ns
Paguro Vector	5	134.509	1.455	ns
Custom DEX Array	10	247.247	6.370	ns
DEX Array	10	268.248	28.881	ns
DEX Vector	10	298.762	14.744	ns
JavaLang Array	10	330.989	12.535	ns
JavaLang Vector	10	582.081	49.258	ns
Paguro Vector	10	266.187	13.947	ns
Custom DEX Array	20	505.337	9.057	ns
DEX Array	20	498.238	22.189	ns
DEX Vector	20	601.862	38.422	ns
JavaLang Array	20	663.423	19.939	ns
JavaLang Vector	20	1208.361	41.356	ns
Paguro Vector	20	523.390	6.200	ns
Custom DEX Array	100	3800.565	216.282	ns
DEX Array	100	3603.850	170.540	ns
DEX Vector	100	3044.926	225.565	ns
JavaLang Array	100	4513.578	168.831	ns
JavaLang Vector	100	7953.840	577.296	ns
Paguro Vector	100	2534.769	34.698	ns



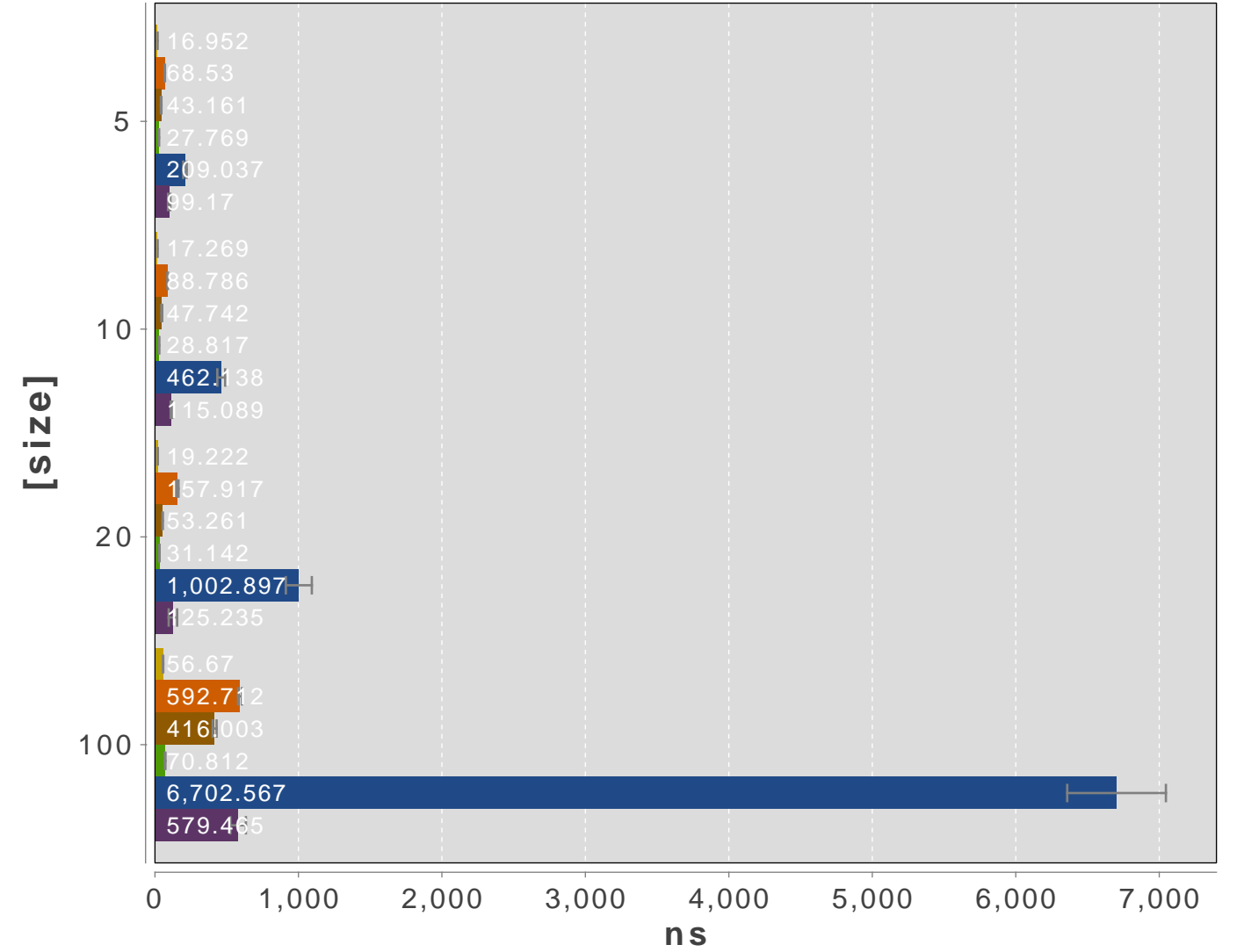
■ Custom Dextx ArrayList 
 ■ Dextx ArrayList 
 ■ Dextx Vector 
 ■ Javaslang Array 
 ■ Javaslang Vector 
 ■ Paguro Vector

## IndexedSequences.build

JMH 1.12 (released 183 days ago, please consider updating!)  
**VM invoker:** /usr/lib/jvm/java-1.8.0-openjdk-1.8.0.102-1.b14.fc24.x86\_64/jre/bin/java  
**VM options:** <none>  
**Forks:** 2 forks  
**Warmup:** 20 iterations, 1 s each  
**Measurement:** 10 iterations, 1 s each  
**Timeout:** 10 min per iteration  
**Threads:** 1 thread, will synchronize iterations  
**Benchmark mode:** Average time, time/op

implementation	[size]	Score	Error (±)	Unit
Custom Dextx ArrayList	5	16.952	0.813	ns
Dextx ArrayList	5	68.530	1.283	ns
Dextx Vector	5	43.161	1.895	ns
Javaslang Array	5	27.769	0.603	ns
Javaslang Vector	5	209.037	11.879	ns
Paguro Vector	5	99.170	8.088	ns
Custom Dextx ArrayList	10	17.269	0.335	ns

Dexx ArrayList	10	88.786	1.395	ns
Dexx Vector	10	47.742	2.900	ns
Javaslang Array	10	28.817	0.938	ns
Javaslang Vector	10	462.138	27.598	ns
Paguro Vector	10	115.089	5.644	ns
Custom Dexx ArrayList	20	19.222	0.730	ns
Dexx ArrayList	20	157.917	6.084	ns
Dexx Vector	20	53.261	0.887	ns
Javaslang Array	20	31.142	0.790	ns
Javaslang Vector	20	1002.897	90.549	ns
Paguro Vector	20	125.235	29.463	ns
Custom Dexx ArrayList	100	56.670	1.053	ns
Dexx ArrayList	100	592.712	13.179	ns
Dexx Vector	100	416.003	13.517	ns
Javaslang Array	100	70.812	2.120	ns
Javaslang Vector	100	6702.567	343.873	ns
Paguro Vector	100	579.465	54.464	ns



Custom Dexx ArrayList

Dexx ArrayList

Dexx Vector

Javaslang Array

Javaslang Vector

Paguro Vector

# IndexedSequences.iterate

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**VM options:** <none>

**Forks:** 2 forks

**Warmup:** 20 iterations, 1 s each

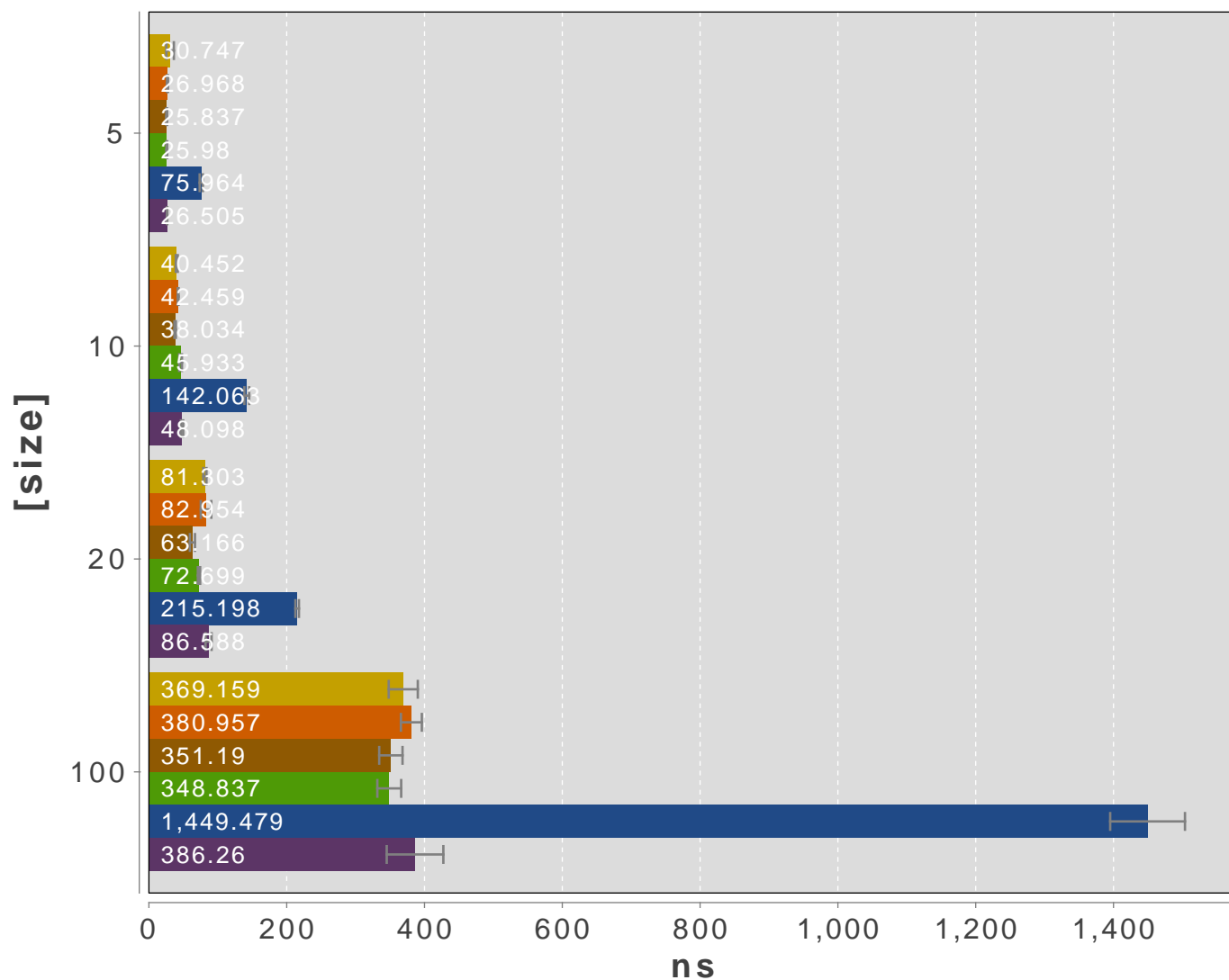
**Measurement:** 10 iterations, 1 s each

**Timeout:** 10 min per iteration

**Threads:** 1 thread, will synchronize iterations

**Benchmark mode:** Average time, time/op

implementation	[size]	Score	Error ( $\pm$ )	Unit
Custom DEX Array	5	30.747	5.456	ns
DEX Array	5	26.968	0.725	ns
DEX Vector	5	25.837	0.592	ns
JavaLang Array	5	25.980	0.581	ns
JavaLang Vector	5	75.964	2.325	ns
Paguro Vector	5	26.505	0.165	ns
Custom DEX Array	10	40.452	1.360	ns
DEX Array	10	42.459	0.577	ns
DEX Vector	10	38.034	1.030	ns
JavaLang Array	10	45.933	2.013	ns
JavaLang Vector	10	142.063	3.516	ns
Paguro Vector	10	48.098	1.649	ns
Custom DEX Array	20	81.303	2.205	ns
DEX Array	20	82.954	7.631	ns
DEX Vector	20	63.166	3.681	ns
JavaLang Array	20	72.699	1.660	ns
JavaLang Vector	20	215.198	2.571	ns
Paguro Vector	20	86.588	4.415	ns
Custom DEX Array	100	369.159	21.096	ns
DEX Array	100	380.957	15.185	ns
DEX Vector	100	351.190	16.928	ns
JavaLang Array	100	348.837	17.310	ns
JavaLang Vector	100	1449.479	54.259	ns
Paguro Vector	100	386.260	41.103	ns



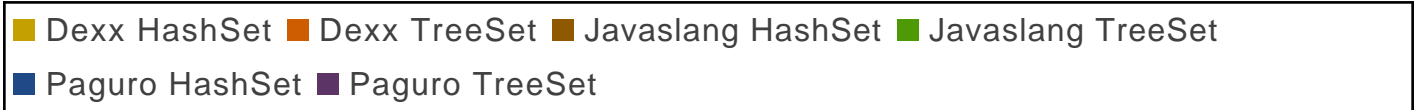
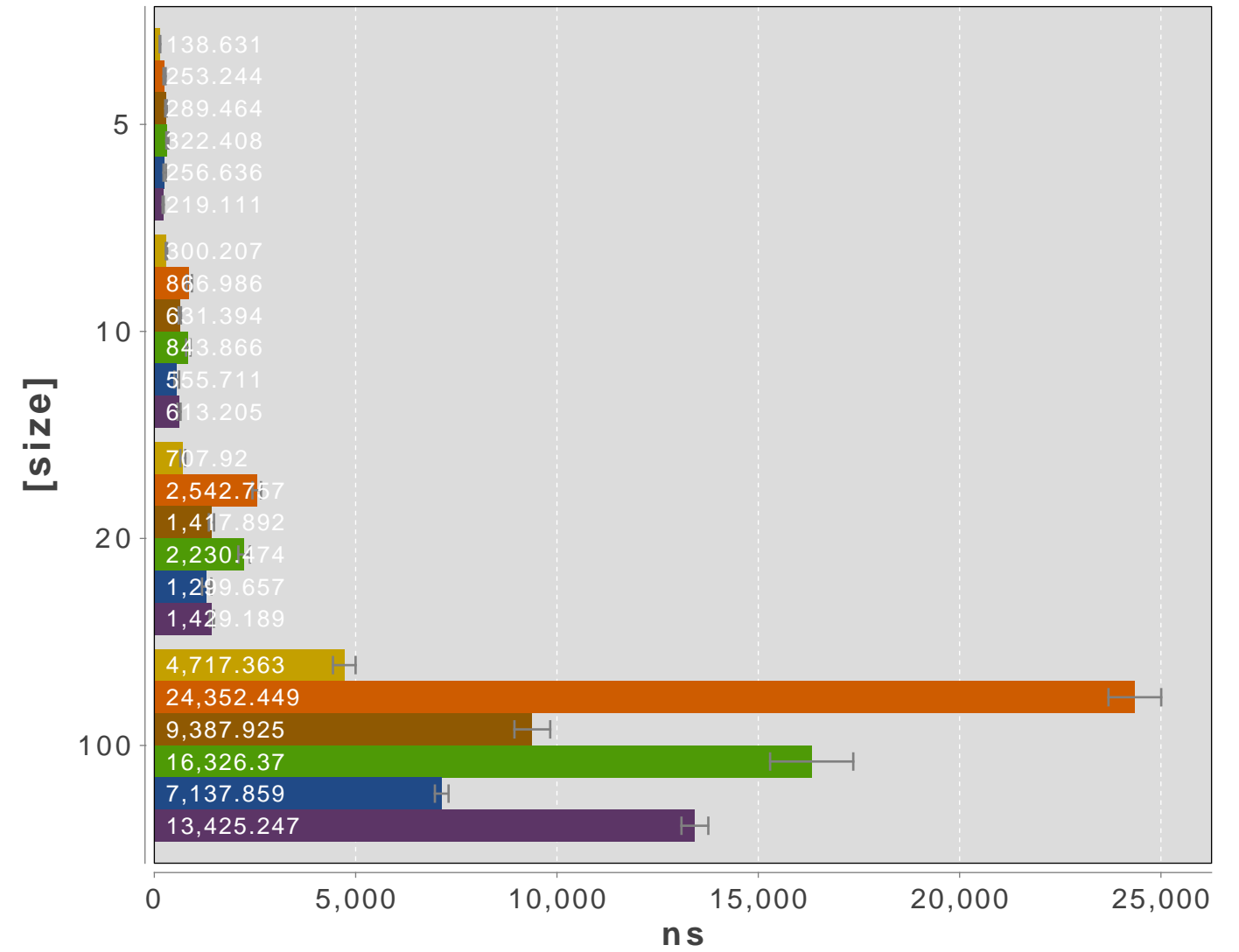
■ Custom Dext ArrayList
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## Sets.append

JMH 1.12 (released 183 days ago, please consider updating!)  
**VM invoker:** /usr/lib/jvm/java-1.8.0-openjdk-1.8.0.102-1.b14.fc24.x86\_64/jre/bin/java  
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implementation	[size]	Score	Error (±)	Unit
Dext HashSet	5	138.631	9.363	ns
Dext TreeSet	5	253.244	26.429	ns
Javaslang HashSet	5	289.464	18.678	ns
Javaslang TreeSet	5	322.408	25.130	ns
Paguro HashSet	5	256.636	29.633	ns
Paguro TreeSet	5	219.111	14.128	ns
Dext HashSet	10	300.207	15.978	ns

Dexx TreeSet	10	866.986	66.704	ns
Javaslang HashSet	10	631.394	30.138	ns
Javaslang TreeSet	10	843.866	55.657	ns
Paguro HashSet	10	555.711	59.147	ns
Paguro TreeSet	10	613.205	37.496	ns
Dexx HashSet	20	707.920	61.472	ns
Dexx TreeSet	20	2542.757	106.362	ns
Javaslang HashSet	20	1417.892	64.730	ns
Javaslang TreeSet	20	2230.474	143.648	ns
Paguro HashSet	20	1299.657	115.309	ns
Paguro TreeSet	20	1429.189	49.781	ns
Dexx HashSet	100	4717.363	280.935	ns
Dexx TreeSet	100	24352.449	654.566	ns
Javaslang HashSet	100	9387.925	444.433	ns
Javaslang TreeSet	100	16326.370	1032.554	ns
Paguro HashSet	100	7137.859	170.136	ns
Paguro TreeSet	100	13425.247	333.270	ns



# Sets.build

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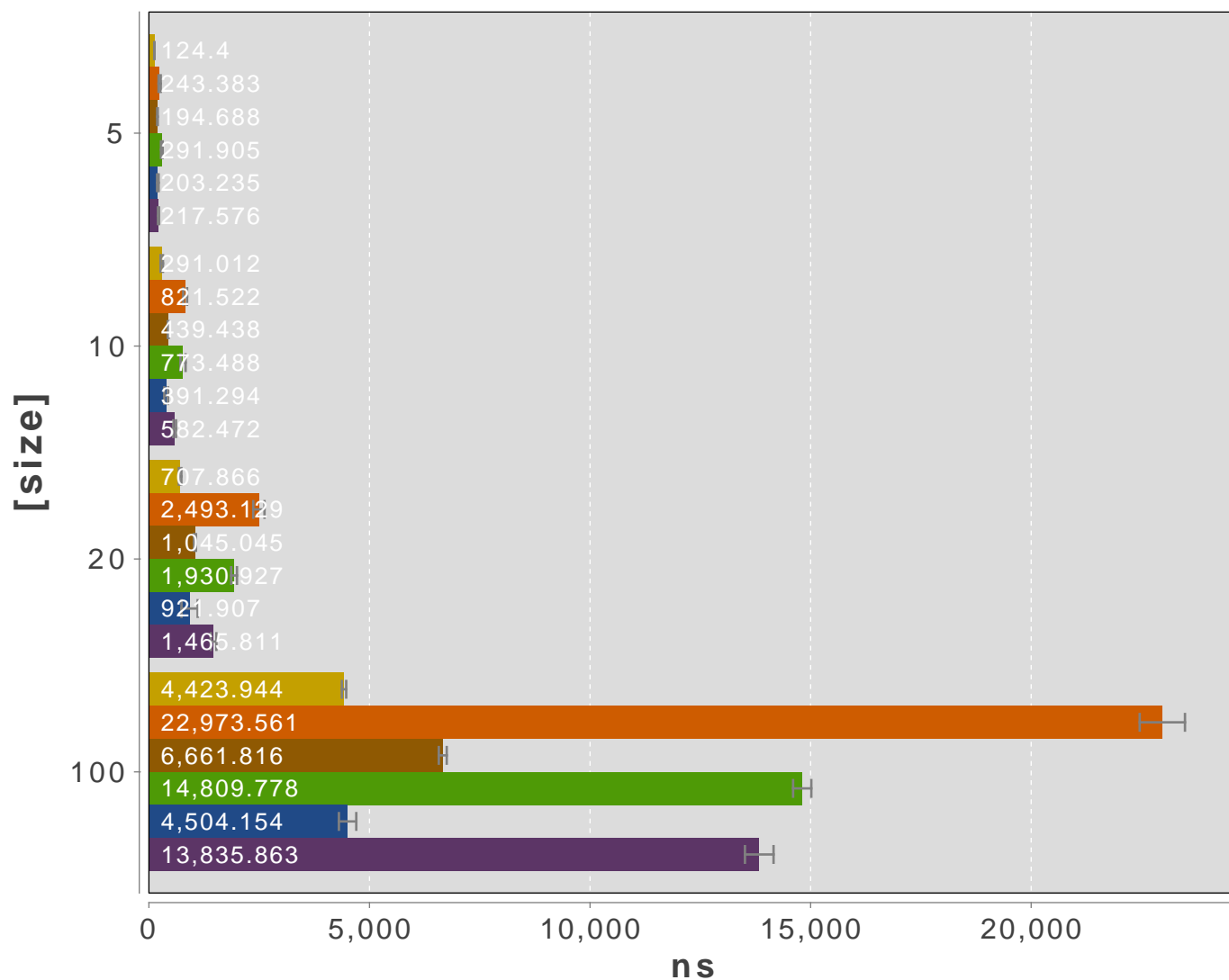
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**Timeout:** 10 min per iteration

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**Benchmark mode:** Average time, time/op

implementation	[size]	Score	Error ( $\pm$ )	Unit
Dexx HashSet	5	124.400	3.611	ns
Dexx TreeSet	5	243.383	24.578	ns
JavaLang HashSet	5	194.688	5.543	ns
JavaLang TreeSet	5	291.905	19.025	ns
Paguro HashSet	5	203.235	17.503	ns
Paguro TreeSet	5	217.576	12.299	ns
Dexx HashSet	10	291.012	27.375	ns
Dexx TreeSet	10	821.522	43.814	ns
JavaLang HashSet	10	439.438	10.346	ns
JavaLang TreeSet	10	773.488	58.250	ns
Paguro HashSet	10	391.294	42.842	ns
Paguro TreeSet	10	582.472	31.829	ns
Dexx HashSet	20	707.866	28.213	ns
Dexx TreeSet	20	2493.129	127.787	ns
JavaLang HashSet	20	1045.045	22.355	ns
JavaLang TreeSet	20	1930.927	65.565	ns
Paguro HashSet	20	921.907	183.217	ns
Paguro TreeSet	20	1465.811	64.010	ns
Dexx HashSet	100	4423.944	48.804	ns
Dexx TreeSet	100	22973.561	513.115	ns
JavaLang HashSet	100	6661.816	89.681	ns
JavaLang TreeSet	100	14809.778	206.313	ns
Paguro HashSet	100	4504.154	196.721	ns
Paguro TreeSet	100	13835.863	324.092	ns



Dexx HashSet
Dexx TreeSet
Javaslang HashSet
Javaslang TreeSet
Paguro HashSet
Paguro TreeSet

## Sets.iterate

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implementation	[size]	Score	Error (±)	Unit
Dexx HashSet	5	74.697	4.442	ns
Dexx TreeSet	5	65.001	2.618	ns
Javaslang HashSet	5	815.968	123.643	ns
Javaslang TreeSet	5	54.090	1.608	ns
Paguro HashSet	5	201.969	10.013	ns
Paguro TreeSet	5	93.784	2.989	ns
Dexx HashSet	10	131.964	8.473	ns



Dexx TreeSet	10	98.135	1.595	ns
Javaslang HashSet	10	1729.076	249.963	ns
Javaslang TreeSet	10	98.355	0.976	ns
Paguro HashSet	10	305.655	12.001	ns
Paguro TreeSet	10	245.140	19.497	ns
Dexx HashSet	20	267.556	14.947	ns
Dexx TreeSet	20	176.596	6.397	ns
Javaslang HashSet	20	4679.930	388.384	ns
Javaslang TreeSet	20	196.993	1.232	ns
Paguro HashSet	20	666.407	89.163	ns
Paguro TreeSet	20	448.332	31.016	ns
Dexx HashSet	100	1389.487	37.327	ns
Dexx TreeSet	100	829.257	17.883	ns
Javaslang HashSet	100	29949.700	1197.961	ns
Javaslang TreeSet	100	935.500	35.079	ns
Paguro HashSet	100	2950.066	67.696	ns
Paguro TreeSet	100	2459.211	106.298	ns

