## Dataset: 50bin ADD, 50bin EXECUTE, 50bin DELETE

Order-by-order: google::dense\_hash\_mapGrouped-by-price: emhash7::HashMap

ADD RESULT	
mean	94.57
std	7240.58
min	28
max	1227731
%1 quantile	29.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	73.0
%99,9 quantile	266.01

EXECUTE RESULT	
mean	38.12
std	294.89
min	26
max	19366
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	101.0
%99,9 quantile	384.0

DELETE RESULT	
36.37	
257.73	
26	
30482	
28.0	
29.0	
30.0	
31.0	
97.0	
247.0	

GLOBAL	GLOBAL RESULT	
mean	56.35	
std	4186.55	
min	26	
max	1227731	
%1 quantile	28.0	
%25 quantile	29.0	
%50 quantile	30.0	
%75 quantile	31.0	
%99 quantile	96.0	
%99,9 quantile	314.0	

Order-by-order: google::dense\_hash\_mapGrouped-by-price: google::dense\_hash\_map

ADD RESULT	
mean	87.49
std	6417.71
min	27
max	1110877
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	58.0
%99,9 quantile	229.01

EXECUTE RESULT	
mean	32.69
std	232.1
min	25
max	20564
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	88.0
%99,9 quantile	177.0

DELETE RESULT	
mean	33.35
std	200.58
min	26
max	20420
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	48.0
%99,9 quantile	155.0

GLOBAL RESULT	
mean	51.18
std	3709.59
min	25
max	1110877
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	56.0
%99,9 quantile	166.0

Order-by-order: google::dense\_hash\_mapGrouped-by-price: hrd7::hash\_map

ADD RESULT	
mean	90.27
std	6609.41
min	26
max	1111821
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	33.0
%99 quantile	66.0
%99,9 quantile	226.02
	1

EXECUTE RESULT	
mean	32.61
std	121.22
min	25
max	18083
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	49.01
%99,9 quantile	172.0

DELETE RESULT	
mean	35.04
std	200.24
min	26
max	18279
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	50.0
%99,9 quantile	152.0

GLOBAL RESULT	
mean	52.64
std	3818.43
min	25
max	1111821
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	56.0
%99,9 quantile	170.0

Order-by-order: google::dense\_hash\_map

• Grouped-by-price: robin\_hood::unordered\_flat\_map

ADD RESULT	
mean	92.24
std	6311.63
min	30
max	1074070
%1 quantile	35.0
%25 quantile	36.0
%50 quantile	37.0
%75 quantile	38.0
%99 quantile	94.0
%99,9 quantile	246.01

EXECUTE RESULT	
36.23	
99.41	
29	
17897	
32.0	
33.0	
34.0	
35.0	
49.0	
133.0	

DELETE RESULT	
mean	31.84
std	22.62
min	26
max	2440
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	51.0
%99,9 quantile	121.0

GLOBAL RESULT	
mean	53.44
std	3644.6
min	26
max	1074070
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	34.0
%75 quantile	37.0
%99 quantile	68.0
%99,9 quantile	161.0

Order-by-order: google::dense\_hash\_map

• Grouped-by-price: ska::bytell\_hash\_map

ADD RESULT	
mean	92.35
std	6370.97
min	30
max	1093462
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	36.0
%75 quantile	37.0
%99 quantile	93.0
%99,9 quantile	258.01

EXECUTE RESULT	
mean	31.46
std	19.01
min	25
max	2466
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	42.0
%99,9 quantile	117.0

DELETE RESULT	
mean	33.43
std	81.99
min	27
max	17792
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	50.0
%99,9 quantile	130.0

GLOBAL RESULT	
mean	52.41
std	3678.71
min	25
max	1093462
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	32.0
%75 quantile	36.0
%99 quantile	76.0
%99,9 quantile	159.0

Order-by-order: google::dense\_hash\_map

• Grouped-by-price: ska::flat\_hash\_map

ADD RESULT	
95.08	
6808.43	
28	
1122557	
32.0	
33.0	
35.0	
37.0	
77.0	
233.0	

EXECUTE RESULT	
mean	33.85
std	181.31
min	25
max	20589
%1 quantile	27.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	42.0
%99,9 quantile	115.0

DELETE RESULT	
mean	32.57
std	98.21
min	25
max	17917
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	48.0
%99,9 quantile	116.0

GLOBAL RESULT	
mean	53.83
std	3932.76
min	25
max	1122557
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	35.0
%99 quantile	54.0
%99,9 quantile	154.0

Order-by-order: google::dense\_hash\_map

• Grouped-by-price: tsl::bhopscotch\_map

ADD RESULT	
mean	99.39
std	7264.91
min	29
max	1205086
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	37.0
%99 quantile	98.0
%99,9 quantile	308.0
·	•

EXECUTE RESULT	
34.07	
219.37	
25	
20681	
27.0	
28.0	
29.0	
30.0	
85.0	
183.0	

DELETE RESULT	
mean	32.96
std	171.35
min	24
max	20588
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	50.0
%99,9 quantile	164.0

GLOBAL RESULT	
55.47	
4197.59	
24	
1205086	
27.0	
28.0	
30.0	
34.0	
90.0	
242.0	

Order-by-order: google::dense\_hash\_map

• Grouped-by-price: tsl::hopscotch\_map

ADD RESULT	
mean	96.67
std	6770.98
min	29
max	1202457
%1 quantile	31.0
%25 quantile	34.0
%50 quantile	35.0
%75 quantile	37.0
%99 quantile	98.0
%99,9 quantile	328.02

EXECUTE RESULT	
mean	31.09
std	133.36
min	25
max	17961
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	43.0
%99,9 quantile	138.0

DELETE RESULT	
33.48	
143.8	
25	
19158	
27.0	
29.0	
30.0	
32.0	
52.0	
162.0	

GLOBAL RESULT	
mean	53.75
std	3910.98
min	25
max	1202457
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	31.0
%75 quantile	35.0
%99 quantile	76.0
%99,9 quantile	180.0

Order-by-order: google::dense\_hash\_map

• Grouped-by-price: tsl::robin\_map

ADD RESULT	
87.7	
6316.38	
28	
1081639	
30.0	
31.0	
33.0	
34.0	
53.0	
211.0	

EXECUTE RESULT	
mean	31.67
std	191.3
min	24
max	20478
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	48.0
%99,9 quantile	114.0

DELETE RESULT	
mean	30.94
std	112.43
min	24
max	17728
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	49.0
%99,9 quantile	129.0

GLOBAL RESULT	
mean	50.1
std	3649.11
min	24
max	1081639
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	32.0
%99 quantile	51.0
%99,9 quantile	136.0

Order-by-order: emhash7::HashMap

• Grouped-by-price: absl::flat\_hash\_map

ADD RESULT	
mean	82.64
std	3635.41
min	39
max	544473
%1 quantile	43.0
%25 quantile	44.0
%50 quantile	45.0
%75 quantile	49.0
%99 quantile	93.0
%99,9 quantile	305.0

EXECUTE RESULT	
mean	36.76
std	100.48
min	28
max	18201
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	37.0
%99 quantile	54.0
%99,9 quantile	156.0

DELETE RESULT	
mean	40.24
std	20.09
min	32
max	2057
%1 quantile	35.0
%25 quantile	36.0
%50 quantile	37.0
%75 quantile	41.0
%99 quantile	64.0
%99,9 quantile	125.0

GLOBAL RESULT	
mean	53.21
std	2099.84
min	28
max	544473
%1 quantile	33.0
%25 quantile	35.0
%50 quantile	39.0
%75 quantile	45.0
%99 quantile	75.0
%99,9 quantile	167.0

Order-by-order: emhash7::HashMapGrouped-by-price: emhash7::HashMap

ADD RESULT	
mean	60.46
std	3637.46
min	23
max	543923
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	28.0
%99 quantile	57.0
%99,9 quantile	165.0

EXECUTE RESULT	
mean	26.53
std	17.88
min	21
max	2056
%1 quantile	22.0
%25 quantile	24.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	37.0
%99,9 quantile	104.0

DELETE RESULT	
mean	29.55
std	19.97
min	24
max	2205
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	45.0
%99,9 quantile	111.0

GLOBAL RESULT	
mean	38.85
std	2100.2
min	21
max	543923
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	49.0
%99,9 quantile	114.0

Order-by-order: emhash7::HashMap

• Grouped-by-price: google::dense\_hash\_map

ADD RESULT	
mean	95.76
std	7751.44
min	26
max	1516888
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	104.0
%99,9 quantile	438.0

EXECUTE RESULT	
mean	31.21
std	224.31
min	24
max	20479
%1 quantile	25.0
%25 quantile	25.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	91.01
%99,9 quantile	182.0

DELETE RESULT	
mean	35.48
std	183.95
min	28
max	21187
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	93.0
%99,9 quantile	185.0

GLOBAL RESULT	
mean	54.15
std	4478.53
min	24
max	1516888
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	32.0
%99 quantile	96.0
%99,9 quantile	282.0

Order-by-order: emhash7::HashMap

• Grouped-by-price: hrd7::hash\_map

ADD RESULT	
mean	76.47
std	5879.13
min	24
max	1160326
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	33.0
%99 quantile	91.0
%99,9 quantile	349.0

EXECUTE RESULT	
mean	30.77
std	25.38
min	24
max	2978
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	47.0
%99,9 quantile	115.0

DELETE RESULT	
mean	33.95
std	21.82
min	27
max	2113
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	32.0
%75 quantile	36.0
%99 quantile	52.0
%99,9 quantile	116.0

GLOBAL	GLOBAL RESULT	
mean	47.07	
std	3394.44	
min	24	
max	1160326	
%1 quantile	27.0	
%25 quantile	28.0	
%50 quantile	30.0	
%75 quantile	33.0	
%99 quantile	54.0	
%99,9 quantile	159.0	

Order-by-order: emhash7::HashMap

• Grouped-by-price: robin\_hood::unordered\_flat\_map

ADD RESULT	
mean	81.8
std	5918.96
min	27
max	1167920
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	38.0
%99 quantile	98.0
%99,9 quantile	311.0

EXECUTE RESULT	
mean	30.09
std	17.24
min	24
max	1907
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	90.0
%99,9 quantile	163.01

DELETE RESULT	
mean	37.01
std	180.37
min	28
max	20535
%1 quantile	31.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	55.0
%99,9 quantile	169.0

GLOBAL RESULT	
mean	49.63
std	3418.99
min	24
max	1167920
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	32.0
%75 quantile	35.0
%99 quantile	92.0
%99,9 quantile	213.0

Order-by-order: emhash7::HashMap

• Grouped-by-price: robin\_hood::unordered\_map

ADD RESULT	
mean	75.73
std	3960.68
min	27
max	605551
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	40.0
%99 quantile	94.0
%99,9 quantile	356.01
%75 quantile %99 quantile	40.0 94.0

EXECUTE RESULT	
mean	34.4
std	201.96
min	24
max	18474
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	43.0
%99,9 quantile	155.0

DELETE RESULT	
mean	38.61
std	209.57
min	28
max	18580
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	38.0
%99 quantile	54.0
%99,9 quantile	131.01

GLOBAL RESULT		
mean	49.58	
std	2292.94	
min	24	
max	605551	
%1 quantile	29.0	
%25 quantile	30.0	
%50 quantile	33.0	
%75 quantile	37.0	
%99 quantile	65.0	
%99,9 quantile	172.0	
max %1 quantile %25 quantile %50 quantile %75 quantile %99 quantile	605551 29.0 30.0 33.0 37.0 65.0	

Order-by-order: emhash7::HashMap

• Grouped-by-price: robin\_hood::unordered\_node\_map

ADD RESULT	
mean	80.75
std	3880.33
min	32
max	583728
%1 quantile	38.0
%25 quantile	40.0
%50 quantile	42.0
%75 quantile	47.0
%99 quantile	101.0
%99,9 quantile	319.0

EXECUTE RESULT	
mean	37.12
std	174.32
min	25
max	29470
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	34.0
%75 quantile	38.0
%99 quantile	54.0
%99,9 quantile	137.01

DELETE RESULT	
mean	40.1
std	20.99
min	29
max	2067
%1 quantile	34.0
%25 quantile	35.0
%50 quantile	37.0
%75 quantile	43.0
%99 quantile	61.0
%99,9 quantile	133.0

GLOBAL RESULT	
mean	52.66
std	2242.69
min	25
max	583728
%1 quantile	32.0
%25 quantile	34.0
%50 quantile	38.0
%75 quantile	43.0
%99 quantile	74.01
%99,9 quantile	171.0

Order-by-order: emhash7::HashMap

Grouped-by-price: ska::bytell\_hash\_map

ADD RESULT	
mean	81.55
std	5912.02
min	27
max	1160938
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	97.0
%99,9 quantile	257.0

EXECUTE RESULT	
mean	30.46
std	106.2
min	24
max	17828
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	46.0
%99,9 quantile	139.01

DELETE RESULT	
mean	34.08
std	21.63
min	28
max	2172
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	49.0
%99,9 quantile	115.0

GLOBAL RESULT	
mean	48.7
std	3413.96
min	24
max	1160938
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	77.01
%99,9 quantile	153.0

Order-by-order: emhash7::HashMapGrouped-by-price: ska::flat\_hash\_map

ADD RESULT	
mean	89.37
std	6689.1
min	27
max	1318017
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	40.0
%99 quantile	96.0
%99,9 quantile	395.01

EXECUTE RESULT	
mean	34.04
std	157.96
min	24
max	20785
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	33.0
%99 quantile	91.0
%99,9 quantile	168.0

DELETE RESULT	
mean	36.75
std	155.03
min	27
max	19799
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	38.0
%99 quantile	55.0
%99,9 quantile	127.0

GLOBAL RESULT	
mean	53.39
std	3864.15
min	24
max	1318017
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	32.0
%75 quantile	37.0
%99 quantile	76.0
%99,9 quantile	185.0

Order-by-order: emhash7::HashMapGrouped-by-price: tsl::bhopscotch\_map

ADD RESULT	
mean	80.06
std	6102.1
min	25
max	1207787
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	31.0
%99 quantile	94.0
%99,9 quantile	332.01

EXECUTE RESULT	
mean	27.44
std	18.06
min	21
max	2195
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	47.0
%99,9 quantile	128.0

DELETE RESULT	
mean	30.86
std	14.63
min	24
max	1385
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	51.0
%99,9 quantile	151.0

GLOBAL RESULT	
mean	46.12
std	3523.16
min	21
max	1207787
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	80.0
%99,9 quantile	180.0

Order-by-order: emhash7::HashMapGrouped-by-price: tsl::hopscotch\_map

ADD RESULT	
mean	65.84
std	3721.12
min	25
max	555991
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	90.0
%99,9 quantile	265.0

EXECUTE RESULT	
mean	28.06
std	139.45
min	21
max	18044
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	26.0
%99 quantile	38.0
%99,9 quantile	108.0

DELETE RESULT	
mean	30.01
std	12.78
min	24
max	1966
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	46.0
%99,9 quantile	111.0

GLOBAL RESULT		
mean	41.31	
std	2149.98	
min	21	
max	555991	
%1 quantile	25.0	
%25 quantile	26.0	
%50 quantile	28.0	
%75 quantile	29.0	
%99 quantile	63.0	
%99,9 quantile	153.0	

Order-by-order: emhash7::HashMapGrouped-by-price: tsl::robin\_map

ADD RESULT	
mean	63.88
std	3783.92
min	24
max	587727
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	55.0
%99,9 quantile	220.0

EXECUTE RESULT	
mean	27.36
std	82.64
min	21
max	17893
%1 quantile	23.0
%25 quantile	24.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	38.0
%99,9 quantile	108.0

DELETE RESULT	
mean	29.57
std	17.15
min	24
max	2125
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	43.0
%99,9 quantile	109.0

GLOBAL RESULT	
mean	40.27
std	2185.26
min	21
max	587727
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	45.0
%99,9 quantile	115.0

Order-by-order: emhash7::HashMapGrouped-by-price: tsl::sparse\_map

ADD RESULT	
mean	91.95
std	5889.27
min	36
max	1162854
%1 quantile	39.0
%25 quantile	41.0
%50 quantile	43.0
%75 quantile	45.0
%99 quantile	142.0
%99,9 quantile	319.0

EXECUTE RESULT	
mean	35.87
std	22.08
min	28
max	1964
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	35.0
%75 quantile	36.0
%99 quantile	56.0
%99,9 quantile	138.0

DELETE RESULT	
mean	43.18
std	19.03
min	35
max	3030
%1 quantile	37.0
%25 quantile	39.0
%50 quantile	41.0
%75 quantile	42.0
%99 quantile	77.0
%99,9 quantile	127.0

GLOBAL RESULT	
mean	57.0
std	3400.31
min	28
max	1162854
%1 quantile	34.0
%25 quantile	36.0
%50 quantile	40.0
%75 quantile	43.0
%99 quantile	106.0
%99,9 quantile	242.0

Order-by-order: tsl::bhopscotch\_mapGrouped-by-price: emhash7::HashMap

ADD RESULT	
mean	80.47
std	6045.94
min	29
max	1188243
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	63.0
%99,9 quantile	249.01

EXECUTE RESULT	
mean	29.51
std	108.79
min	23
max	17627
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	48.0
%99,9 quantile	152.0

DELETE RESULT	
mean	30.85
std	138.92
min	24
max	28260
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	49.0
%99,9 quantile	118.0

GLOBAL RESULT	
mean	46.94
std	3492.19
min	23
max	1188243
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	32.0
%99 quantile	56.0
%99,9 quantile	162.0

Order-by-order: tsl::bhopscotch\_map

• Grouped-by-price: google::dense\_hash\_map

ADD RESULT	
mean	82.06
std	5338.7
min	29
max	951989
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	63.0
%99,9 quantile	306.0

EXECUTE RESULT	
mean	26.77
std	19.47
min	23
max	2388
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	26.0
%99 quantile	39.0
%99,9 quantile	109.0

DELETE RESULT	
mean	36.13
std	246.75
min	27
max	19016
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	49.0
%99,9 quantile	149.0

GLOBAL RESULT	
mean	48.32
std	3085.71
min	23
max	951989
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	56.0
%99,9 quantile	165.0

Order-by-order: tsl::bhopscotch\_map

• Grouped-by-price: hrd7::hash\_map

ADD RESULT	
mean	83.5
std	6101.86
min	29
max	1202475
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	38.0
%99 quantile	64.0
%99,9 quantile	302.0

EXECUTE RESULT	
mean	31.58
std	19.69
min	24
max	1989
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	52.0
%99,9 quantile	153.0

DELETE RESULT	
mean	34.94
std	15.56
min	27
max	1936
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	54.0
%99,9 quantile	116.0

GLOBAL RESULT	
mean	50.01
std	3523.02
min	24
max	1202475
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	32.0
%75 quantile	35.0
%99 quantile	57.0
%99,9 quantile	159.0

Order-by-order: tsl::bhopscotch\_map

• Grouped-by-price: robin\_hood::unordered\_flat\_map

ADD RESULT	
mean	92.95
std	6162.51
min	33
max	1214643
%1 quantile	37.0
%25 quantile	38.0
%50 quantile	40.0
%75 quantile	45.0
%99 quantile	103.0
%99,9 quantile	422.0

EXECUTE RESULT	
mean	41.51
std	306.03
min	25
max	21167
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	35.0
%99 quantile	114.0
%99,9 quantile	423.0

DELETE RESULT	
mean	41.56
std	207.8
min	29
max	18205
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	35.0
%75 quantile	40.0
%99 quantile	104.0
%99,9 quantile	380.01

GLOBAL RESULT	
mean	58.67
std	3564.41
min	25
max	1214643
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	36.0
%75 quantile	41.0
%99 quantile	107.0
%99,9 quantile	400.0

• Order-by-order: tsl::bhopscotch\_map

• Grouped-by-price: robin\_hood::unordered\_map

ADD RESULT	
mean	87.67
std	6087.48
min	33
max	1193916
%1 quantile	36.0
%25 quantile	37.0
%50 quantile	38.0
%75 quantile	40.0
%99 quantile	97.0
%99,9 quantile	272.02

EXECUTE RESULT	
mean	31.49
std	158.3
min	24
max	30102
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	93.0
%99,9 quantile	262.0
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DELETE RESULT	
mean	36.28
std	159.74
min	28
max	18087
%1 quantile	31.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	57.0
%99,9 quantile	126.0

GLOBAL RESULT	
mean	51.82
std	3517.09
min	24
max	1193916
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	33.0
%75 quantile	38.0
%99 quantile	81.0
%99,9 quantile	206.0

Order-by-order: tsl::bhopscotch\_map

• Grouped-by-price: robin\_hood::unordered\_node\_map

ADD RESULT	
mean	93.19
std	6322.38
min	33
max	1263093
%1 quantile	38.0
%25 quantile	40.0
%50 quantile	42.0
%75 quantile	48.0
%99 quantile	100.0
%99,9 quantile	373.01

EXECUTE RESULT	
mean	34.83
std	21.56
min	25
max	2385
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	37.0
%99 quantile	97.0
%99,9 quantile	134.0

DELETE RESULT	
mean	40.01
std	24.21
min	30
max	3389
%1 quantile	34.0
%25 quantile	35.0
%50 quantile	37.0
%75 quantile	43.0
%99 quantile	63.0
%99,9 quantile	131.0

GLOBAL RESULT	
mean	56.01
std	3650.37
min	25
max	1263093
%1 quantile	31.0
%25 quantile	34.0
%50 quantile	38.0
%75 quantile	43.0
%99 quantile	78.0
%99,9 quantile	170.0

Order-by-order: tsl::bhopscotch\_map

• Grouped-by-price: ska::bytell\_hash\_map

ADD RESULT	
mean	88.86
std	6111.07
min	32
max	1204426
%1 quantile	36.0
%25 quantile	37.0
%50 quantile	38.0
%75 quantile	40.0
%99 quantile	100.0
%99,9 quantile	361.02

EXECUTE RESULT	
mean	30.31
std	15.4
min	24
max	1957
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	90.0
%99,9 quantile	138.01

DELETE RESULT	
mean	35.97
std	99.0
min	28
max	17840
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	56.0
%99,9 quantile	147.0

GLOBAL RESULT	
mean	51.71
std	3528.8
min	24
max	1204426
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	34.0
%75 quantile	38.0
%99 quantile	91.01
%99,9 quantile	172.0

Order-by-order: tsl::bhopscotch\_mapGrouped-by-price: ska::flat\_hash\_map

SULT
89.19
6320.21
32
1231309
34.0
36.0
36.0
41.0
69.0
279.02

EXECUTE RESULT	
mean	31.7
std	100.68
min	23
max	17890
%1 quantile	26.0
%25 quantile	29.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	56.01
%99,9 quantile	150.0

r	
DELETE RESULT	
mean	34.33
std	107.62
min	25
max	18075
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	34.0
%99 quantile	52.0
%99,9 quantile	123.0

GLOBAL RESULT	
mean	51.74
std	3650.06
min	23
max	1231309
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	32.0
%75 quantile	37.0
%99 quantile	60.0
%99,9 quantile	161.0

Order-by-order: tsl::bhopscotch\_mapGrouped-by-price: tsl::bhopscotch\_map

ADD RESULT	
mean	86.07
std	6083.6
min	31
max	1199017
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	36.0
%75 quantile	38.0
%99 quantile	97.0
%99,9 quantile	267.0

EXECUTE RESULT	
mean	30.16
std	166.49
min	23
max	20199
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	53.0
%99,9 quantile	135.0
' '	

DELETE RESULT	
mean	33.68
std	177.73
min	25
max	17940
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	52.0
%99,9 quantile	148.0

GLOBAL RESULT	
mean	49.97
std	3515.27
min	23
max	1199017
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	30.0
%75 quantile	35.0
%99 quantile	80.0
%99,9 quantile	177.0

Order-by-order: tsl::bhopscotch\_mapGrouped-by-price: tsl::hopscotch\_map

ADD RESULT	
mean	85.39
std	6022.7
min	31
max	1185699
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	35.0
%75 quantile	38.0
%99 quantile	92.0
%99,9 quantile	233.0

EXECUTE	RESULT
mean	29.18
std	98.65
min	23
max	17826
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	56.0
%99,9 quantile	144.0

DELETE RESULT	
mean	31.99
std	23.17
min	25
max	2081
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	53.0
%99,9 quantile	116.0

GLOBAL RESULT		
mean	48.85	
std	3477.8	
min	23	
max	1185699	
%1 quantile	26.0	
%25 quantile	28.0	
%50 quantile	30.0	
%75 quantile	35.0	
%99 quantile	78.01	
%99,9 quantile	163.0	

Order-by-order: tsl::bhopscotch\_map

• Grouped-by-price: tsl::robin\_map

ADD RESULT	
mean	83.78
std	4698.25
min	32
max	788402
%1 quantile	34.0
%25 quantile	35.0
%50 quantile	36.0
%75 quantile	37.0
%99 quantile	91.01
%99,9 quantile	450.0

EXECUTE RESULT	
34.68	
241.06	
24	
23490	
26.0	
28.0	
29.0	
31.0	
102.0	
301.0	

DELETE RESULT	
mean	34.79
std	116.07
min	26
max	12705
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	100.0
%99,9 quantile	281.01
•	

GLOBAL RESULT	
mean	51.08
std	2717.03
min	24
max	788402
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	32.0
%75 quantile	36.0
%99 quantile	99.0
%99,9 quantile	351.0

Order-by-order: tsl::hopscotch\_mapGrouped-by-price: emhash7::HashMap

ADD RESULT	
84.24	
4983.41	
29	
786330	
32.0	
33.0	
34.0	
36.0	
70.0	
407.01	

EXECUTE RESULT	
mean	34.1
std	220.21
min	24
max	18241
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	92.0
%99,9 quantile	224.02

DELETE RESULT	
mean	34.81
std	133.74
min	26
max	23417
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	34.0
%99 quantile	60.0
%99,9 quantile	140.0

GLOBAL RESULT		
mean	51.05	
std	2881.11	
min	24	
max	786330	
%1 quantile	28.0	
%25 quantile	30.0	
%50 quantile	32.0	
%75 quantile	34.0	
%99 quantile	87.0	
%99,9 quantile	264.0	

• Order-by-order: tsl::hopscotch\_map

• Grouped-by-price: google::dense\_hash\_map

ADD RESULT	
mean	90.4
std	6879.25
min	29
max	1352316
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	71.01
%99,9 quantile	374.01

EXECUTE RESULT	
mean	28.18
std	112.25
min	23
max	17641
%1 quantile	25.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	87.01
%99,9 quantile	169.02
%99,9 quantile	109.02

DELETE RESULT	
mean	32.09
std	18.92
min	27
max	1968
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	52.0
%99,9 quantile	114.0

GLOBAL RESULT	
mean	50.22
std	3972.38
min	23
max	1352316
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	30.0
%75 quantile	33.0
%99 quantile	63.0
%99,9 quantile	207.0

Order-by-order: tsl::hopscotch\_mapGrouped-by-price: hrd7::hash\_map

ADD RESULT	
mean	84.5
std	6148.2
min	28
max	1211624
%1 quantile	32.0
%25 quantile	34.0
%50 quantile	35.0
%75 quantile	37.0
%99 quantile	68.0
%99,9 quantile	339.01

EXECUTE RESULT	
mean	32.13
std	144.1
min	24
max	17877
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	93.01
%99,9 quantile	167.0

DELETE RESULT	
mean	40.78
std	240.86
min	27
max	19924
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	34.0
%75 quantile	36.0
%99 quantile	118.0
%99,9 quantile	340.0

GLOBAL RESULT	
mean	52.47
std	3553.44
min	24
max	1211624
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	99.0
%99,9 quantile	291.0

Order-by-order: tsl::hopscotch\_map

Grouped-by-price: ska::unordered\_map

ADD RESULT	
mean	83.04
std	4219.63
min	32
max	687069
%1 quantile	37.0
%25 quantile	39.0
%50 quantile	41.0
%75 quantile	48.0
%99 quantile	88.0
%99,9 quantile	317.0

EXECUTE RESULT	
mean	34.7
std	22.6
min	24
max	3060
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	32.0
%75 quantile	38.0
%99 quantile	59.0
%99,9 quantile	126.0

DELETE RESULT	
mean	38.61
std	127.89
min	27
max	18019
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	41.0
%99 quantile	69.0
%99,9 quantile	131.0

GLOBAL RESULT	
mean	52.12
std	2437.46
min	24
max	687069
%1 quantile	29.0
%25 quantile	32.0
%50 quantile	38.0
%75 quantile	42.0
%99 quantile	77.0
%99,9 quantile	170.0

Order-by-order: tsl::hopscotch\_map

• Grouped-by-price: tsl::bhopscotch\_map

ADD RESULT	
86.58	
6109.99	
30	
1203668	
33.0	
35.0	
36.0	
38.0	
95.0	
252.0	

EXECUTE RESULT	
mean	28.22
std	21.14
min	23
max	2062
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	48.0
%99,9 quantile	112.0

DELETE RESULT	
mean	31.32
std	17.01
min	25
max	2036
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	54.0
%99,9 quantile	117.0

GLOBAL RESULT	
mean	48.71
std	3527.74
min	23
max	1203668
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	30.0
%75 quantile	36.0
%99 quantile	75.0
%99,9 quantile	157.0

Order-by-order: tsl::hopscotch\_mapGrouped-by-price: tsl::hopscotch\_map

ADD RESULT	
mean	86.59
std	6128.83
min	30
max	1207354
%1 quantile	33.0
%25 quantile	35.0
%50 quantile	36.0
%75 quantile	39.0
%99 quantile	93.0
%99,9 quantile	242.0

EXECUTE RESULT	
30.17	
133.81	
23	
20517	
24.0	
26.0	
27.0	
29.0	
73.09	
132.0	

DELETE RESULT	
mean	32.54
std	82.39
min	25
max	18020
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	54.0
%99,9 quantile	114.0

GLOBAL RESULT	
mean	49.77
std	3539.74
min	23
max	1207354
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	31.0
%75 quantile	36.0
%99 quantile	78.0
%99,9 quantile	153.0

Order-by-order: tsl::hopscotch\_map

• Grouped-by-price: tsl::robin\_map

ADD RESULT	
mean	72.41
std	4207.58
min	29
max	683192
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	34.0
%75 quantile	35.0
%99 quantile	56.0
%99,9 quantile	257.01

EXECUTE RESULT	
28.22	
19.4	
23	
2088	
24.0	
26.0	
28.0	
28.0	
39.0	
142.0	

DELETE RESULT	
mean	30.45
std	19.5
min	24
max	1956
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	44.0
%99,9 quantile	110.0

GLOBAL RESULT		
mean	43.69	
std	2429.38	
min	23	
max	683192	
%1 quantile	26.0	
%25 quantile	28.0	
%50 quantile	29.0	
%75 quantile	33.0	
%99 quantile	50.0	
%99,9 quantile	157.0	

Order-by-order: tsl::robin\_map

• Grouped-by-price: emhash7::HashMap

ADD RESULT	
mean	94.49
std	6779.04
min	31
max	1035031
%1 quantile	32.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	78.0
%99,9 quantile	285.01

EXECUTE RESULT	
mean	28.76
std	145.54
min	21
max	18000
%1 quantile	23.0
%25 quantile	25.0
%50 quantile	27.0
%75 quantile	27.0
%99 quantile	46.0
%99,9 quantile	147.0

DELETE RESULT	
mean	31.94
std	118.69
min	24
max	17982
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	50.0
%99,9 quantile	137.0

GLOBAL RESULT	
mean	51.73
std	3915.5
min	21
max	1035031
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	30.0
%75 quantile	33.0
%99 quantile	59.0
%99,9 quantile	167.0

Order-by-order: tsl::robin\_map

• Grouped-by-price: google::dense\_hash\_map

ADD RESULT	
mean	99.98
std	6820.63
min	32
max	1035725
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	34.0
%75 quantile	35.0
%99 quantile	89.01
%99,9 quantile	340.03

EXECUTE RESULT	
mean	26.63
std	24.15
min	23
max	2155
%1 quantile	24.0
%25 quantile	24.0
%50 quantile	25.0
%75 quantile	26.0
%99 quantile	85.0
%99,9 quantile	120.0

DELETE RESULT	
mean	32.38
std	26.38
min	27
max	2322
%1 quantile	29.0
%25 quantile	29.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	50.0
%99,9 quantile	116.0

GLOBAL RESULT	
mean	53.0
std	3938.09
min	23
max	1035725
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	31.0
%75 quantile	34.0
%99 quantile	83.0
%99,9 quantile	150.0

Order-by-order: tsl::robin\_mapGrouped-by-price: hrd7::hash\_map

ADD RESULT	
93.49	
7119.17	
32	
1406215	
33.0	
33.0	
34.0	
35.0	
72.0	
299.01	

EXECUTE RESULT	
mean	33.92
std	161.48
min	24
max	18007
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	55.0
%99,9 quantile	160.0
	I

DELETE RESULT	
mean	35.03
std	23.91
min	28
max	2887
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	32.0
%75 quantile	37.0
%99 quantile	53.0
%99,9 quantile	120.0

GLOBAL RESULT	
mean	54.14
std	4111.43
min	24
max	1406215
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	56.0
%99,9 quantile	162.0

Order-by-order: tsl::robin\_map

• Grouped-by-price: tsl::bhopscotch\_map

ADD RESULT		
mean	100.61	
std	6954.89	
min	32	
max	1042719	
%1 quantile	34.0	
%25 quantile	34.0	
%50 quantile	35.0	
%75 quantile	36.0	
%99 quantile	99.0	
%99,9 quantile	406.02	

EXECUTE RESULT	
mean	29.96
std	169.06
min	21
max	17852
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	54.01
%99,9 quantile	160.01

DELETE RESULT	
mean	34.01
std	148.7
min	24
max	17859
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	33.0
%99 quantile	53.0
%99,9 quantile	150.0

GLOBAL RESULT		
mean	54.86	
std	4017.64	
min	21	
max	1042719	
%1 quantile	25.0	
%25 quantile	27.0	
%50 quantile	32.0	
%75 quantile	35.0	
%99 quantile	87.0	
%99,9 quantile	245.0	

Order-by-order: tsl::robin\_map

Grouped-by-price: tsl::hopscotch\_map

ADD RESULT	
mean	98.23
std	7232.56
min	32
max	1446508
%1 quantile	34.0
%25 quantile	34.0
%50 quantile	35.0
%75 quantile	36.0
%99 quantile	97.0
%99,9 quantile	390.01

EXECUTE RESULT	
mean	29.92
std	183.96
min	22
max	23328
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	51.0
%99,9 quantile	157.0

DELETE RESULT	
mean	33.01
std	59.65
min	26
max	12415
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	51.0
%99,9 quantile	132.0

GLOBAL RESULT	
mean	53.72
std	4177.33
min	22
max	1446508
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	31.0
%75 quantile	35.0
%99 quantile	87.0
%99,9 quantile	233.0

Order-by-order: tsl::robin\_mapGrouped-by-price: tsl::robin\_map

ADD RESULT		
mean	106.38	
std	8608.65	
min	32	
max	1517756	
%1 quantile	33.0	
%25 quantile	33.0	
%50 quantile	34.0	
%75 quantile	35.0	
%99 quantile	88.0	
%99,9 quantile	282.01	

EXECUTE RESULT		
mean	30.36	
std	184.07	
min	22	
max	19643	
%1 quantile	24.0	
%25 quantile	26.0	
%50 quantile	27.0	
%75 quantile	28.0	
%99 quantile	85.0	
%99,9 quantile	184.0	

DELETE RESULT	
mean	31.81
std	106.06
min	25
max	15320
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	48.0
%99,9 quantile	150.0

GLOBAL RESULT		
mean	56.18	
std	4971.84	
min	22	
max	1517756	
%1 quantile	26.0	
%25 quantile	27.0	
%50 quantile	30.0	
%75 quantile	34.0	
%99 quantile	60.0	
%99,9 quantile	200.0	