## Dataset: 2.5 milyon ADD, 10 milyon EXECUTE, 2.5 milyon DELETE

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

ADD RESULT	
mean	61.86
std	28708.78
min	26
max	39983700
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	51.0
%99,9 quantile	134.0

EXECUTE RESULT	
mean	29.7
std	85.25
min	24
max	23332
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	88.0
%99,9 quantile	139.0

DELETE RESULT	
29.05	
87.12	
24	
23290	
25.0	
26.0	
27.0	
28.0	
87.0	
217.0	

GLOBAL RESULT	
mean	34.95
std	11720.58
min	24
max	39983700
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	86.0
%99,9 quantile	154.0

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

ADD RESULT	
mean	61.72
std	27106.32
min	27
max	37031513
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	51.0
%99,9 quantile	134.0

EXECUTE RESULT	
mean	29.46
std	83.02
min	24
max	23622
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	28.0
%99 quantile	88.0
%99,9 quantile	130.0

DELETE RESULT	
mean	29.98
std	48.99
min	26
max	18039
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	29.0
%99 quantile	88.0
%99,9 quantile	105.0

GLOBAL RESULT	
34.93	
11066.34	
24	
37031513	
27.0	
27.0	
28.0	
29.0	
86.0	
128.0	

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

• Grouped-by-price: hrd7::hash\_map

ADD RESULT	
mean	62.86
std	26630.37
min	26
max	36283770
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	50.0
%99,9 quantile	126.0

EXECUTE RESULT	
mean	32.64
std	102.38
min	24
max	132920
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	91.0
%99,9 quantile	141.0

DELETE RESULT	
mean	32.31
std	65.14
min	26
max	20670
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	90.0
%99,9 quantile	137.0

GLOBAL RESULT	
mean	37.62
std	10872.16
min	24
max	36283770
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	89.0
%99,9 quantile	136.0

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

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

ADD RESULT	
mean	64.43
std	26830.84
min	27
max	36610965
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	50.0
%99,9 quantile	135.0

EXECUTE RESULT	
mean	42.06
std	117.3
min	33
max	30231
%1 quantile	37.0
%25 quantile	38.0
%50 quantile	39.0
%75 quantile	40.0
%99 quantile	98.0
%99,9 quantile	161.0

DELETE RESULT	
mean	31.82
std	45.13
min	25
max	17985
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	30.0
%99 quantile	89.0
%99,9 quantile	184.0

GLOBAL RESULT	
mean	44.08
std	10954.08
min	25
max	36610965
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	38.0
%75 quantile	40.0
%99 quantile	94.0
%99,9 quantile	158.0

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

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

ADD RESULT	
mean	64.6
std	27230.73
min	27
max	37295528
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	50.0
%99,9 quantile	133.0

EXECUTE RESULT	
mean	32.37
std	92.54
min	25
max	26511
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	91.0
%99,9 quantile	137.0

DELETE RESULT	
mean	32.86
std	50.03
min	26
max	18340
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	90.0
%99,9 quantile	126.0

GLOBAL RESULT	
mean	37.82
std	11117.18
min	25
max	37295528
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	89.0
%99,9 quantile	135.0

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

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

ADD RESULT	
mean	65.18
std	27973.66
min	26
max	38144729
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	50.0
%99,9 quantile	160.0

EXECUTE RESULT	
mean	31.65
std	73.0
min	24
max	31277
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	92.0
%99,9 quantile	171.0

DELETE RESULT	
mean	32.91
std	144.85
min	24
max	21410
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	91.0
%99,9 quantile	154.0

GLOBAL RESULT	
mean	37.45
std	11420.52
min	24
max	38144729
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	89.0
%99,9 quantile	166.0

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

ADD RESULT	
mean	65.85
std	26810.64
min	29
max	36407858
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	50.0
%99,9 quantile	128.0

EXECUTE RESULT	
31.15	
127.82	
24	
156020	
27.0	
28.0	
29.0	
30.0	
90.0	
160.0	

DELETE RESULT	
mean	30.87
std	100.77
min	24
max	26925
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	29.0
%99 quantile	92.0
%99,9 quantile	217.0

GLOBAL RESULT	
36.89	
10945.98	
24	
36407858	
27.0	
28.0	
29.0	
31.0	
89.0	
165.0	

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

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

ADD RESULT	
mean	67.76
std	27285.98
min	29
max	37388057
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	36.0
%99 quantile	50.0
%99,9 quantile	138.0

EXECUTE RESULT	
mean	31.48
std	89.21
min	24
max	28627
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	90.0
%99,9 quantile	132.0

DELETE RESULT	
mean	33.62
std	190.63
min	25
max	142619
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	92.0
%99,9 quantile	181.0

GLOBAL RESULT		
mean	37.88	
std	11139.97	
min	24	
max	37388057	
%1 quantile	27.0	
%25 quantile	28.0	
%50 quantile	29.0	
%75 quantile	34.0	
%99 quantile	89.0	
%99,9 quantile	137.0	

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

• Grouped-by-price: tsl::robin\_map

ADD RESULT	
mean	65.56
std	26876.71
min	27
max	36393596
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	48.0
%99,9 quantile	139.0

EXECUTE RESULT	
mean	30.24
std	76.41
min	24
max	26367
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	29.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	145.0

DELETE RESULT	
mean	29.73
std	64.14
min	24
max	20528
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	87.0
%99,9 quantile	155.0

GLOBAL RESULT	
mean	36.04
std	10972.59
min	24
max	36393596
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	87.0
%99,9 quantile	144.0

• Order-by-order: emhash7::HashMap

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

ADD RESULT	
mean	72.7
std	19861.94
min	39
max	27317652
%1 quantile	44.0
%25 quantile	45.0
%50 quantile	46.0
%75 quantile	48.0
%99 quantile	101.0
%99,9 quantile	271.0

EXECUTE RESULT	
mean	36.92
std	69.82
min	27
max	27173
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	37.0
%99 quantile	95.0
%99,9 quantile	285.0

DELETE RESULT	
mean	42.09
std	158.39
min	32
max	28873
%1 quantile	36.0
%25 quantile	36.0
%50 quantile	38.0
%75 quantile	40.0
%99 quantile	97.0
%99,9 quantile	247.0

GLOBAL RESULT	
mean	43.74
std	8109.07
min	27
max	27317652
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	36.0
%75 quantile	42.0
%99 quantile	97.0
%99,9 quantile	280.0

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

ADD RESULT	
mean	49.3
std	18266.03
min	23
max	24529299
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	87.0
%99,9 quantile	176.0

EXECUTE RESULT	
mean	28.18
std	84.45
min	21
max	26434
%1 quantile	23.0
%25 quantile	24.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	88.0
%99,9 quantile	186.0

DELETE RESULT	
mean	29.6
std	51.77
min	23
max	20845
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	28.0
%99 quantile	89.0
%99,9 quantile	205.0

GLOBAL RESULT	
mean	31.94
std	7457.43
min	21
max	24529299
%1 quantile	23.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	28.0
%99 quantile	88.0
%99,9 quantile	187.0

Order-by-order: emhash7::HashMap

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

ADD RESULT	
mean	51.9
std	20165.36
min	24
max	27766170
%1 quantile	26.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	27.0
%99 quantile	88.0
%99,9 quantile	190.0

RESULT
26.79
65.84
21
26796
23.0
24.0
25.0
26.0
87.0
158.0

DELETE RESULT	
mean	31.19
std	66.9
min	26
max	26121
%1 quantile	28.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	91.0
%99,9 quantile	137.0

GLOBAL RESULT	
mean	31.7
std	8232.7
min	21
max	27766170
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	88.0
%99,9 quantile	154.0

Order-by-order: emhash7::HashMap

• Grouped-by-price: hrd7::hash\_map

ADD RESULT	
mean	52.29
std	18654.52
min	24
max	25180324
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	244.0

EXECUTE RESULT	
mean	31.32
std	86.44
min	23
max	49397
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	89.0
%99,9 quantile	124.0

DELETE RESULT	
mean	33.75
std	50.42
min	26
max	27546
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	33.0
%99 quantile	91.0
%99,9 quantile	184.0

GLOBAL RESULT	
mean	35.22
std	7616.03
min	23
max	25180324
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	89.0
%99,9 quantile	144.0

Order-by-order: emhash7::HashMap

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

ADD RESULT		
mean	52.55	
std	18278.22	
min	24	
max	24333209	
%1 quantile	26.0	
%25 quantile	27.0	
%50 quantile	27.0	
%75 quantile	29.0	
%99 quantile	89.0	
%99,9 quantile	316.0	

EXECUTE RESULT	
mean	30.9
std	69.46
min	23
max	27998
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	205.0

DELETE RESULT	
mean	35.57
std	90.72
min	27
max	20587
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	92.0
%99,9 quantile	222.0

GLOBAL RESULT	
GLOBAL	RESULI
mean	35.29
std	7462.36
min	23
max	24333209
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	33.0
%99 quantile	90.0
%99,9 quantile	225.0

Order-by-order: emhash7::HashMap

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

ADD RESULT	
mean	52.06
std	18520.3
min	24
max	24295742
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	89.0
%99,9 quantile	218.0
%1 quantile %25 quantile %50 quantile %75 quantile %99 quantile	26.0 27.0 27.0 28.0 89.0

EXECUTE RESULT	
mean	30.27
std	66.93
min	23
max	26330
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	278.0

DELETE RESULT	
mean	36.46
std	164.83
min	27
max	22237
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	93.0
%99,9 quantile	214.0

GLOBAL RESULT		
mean	34.93	
std	7561.38	
min	23	
max	24295742	
%1 quantile	26.0	
%25 quantile	27.0	
%50 quantile	28.0	
%75 quantile	31.0	
%99 quantile	90.0	
%99,9 quantile	262.0	

Order-by-order: emhash7::HashMap

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

ADD RESULT	
mean	57.28
std	17934.24
min	24
max	23855013
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	39.0
%99 quantile	90.0
%99,9 quantile	228.0

EXECUTE RESULT	
mean	36.65
std	92.49
min	24
max	27448
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	39.0
%99 quantile	93.0
%99,9 quantile	199.0

DELETE RESULT	
mean	39.34
std	81.25
min	27
max	27230
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	35.0
%75 quantile	42.0
%99 quantile	98.0
%99,9 quantile	236.0

GLOBAL RESULT	
mean	40.54
std	7322.09
min	24
max	23855013
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	34.0
%75 quantile	39.0
%99 quantile	93.0
%99,9 quantile	213.0

Order-by-order: emhash7::HashMap

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

ADD RESULT	
mean	51.45
std	18353.9
min	24
max	24581600
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	284.0

EXECUTE RESULT	
mean	30.82
std	81.29
min	23
max	26160
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	304.0

DELETE RESULT	
mean	34.16
std	49.0
min	27
max	18044
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	92.0
%99,9 quantile	208.0

GLOBAL RESULT	
mean	34.81
std	7493.27
min	23
max	24581600
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	90.0
%99,9 quantile	290.0

Order-by-order: emhash7::HashMap

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

ADD RESULT	
mean	52.42
std	18674.18
min	23
max	24598197
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	29.0
%99 quantile	88.0
%99,9 quantile	246.0

EXECUTE RESULT	
mean	30.65
std	59.83
min	22
max	20535
%1 quantile	25.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	88.0
%99,9 quantile	294.0

DELETE	RESULT
mean	33.64
std	151.94
min	24
max	27328
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	90.0
%99,9 quantile	199.0

GLOBAL RESULT	
mean	34.77
std	7624.11
min	22
max	24598197
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	89.0
%99,9 quantile	280.0

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

ADD RESULT	
51.91	
18502.18	
25	
24846528	
26.0	
27.0	
28.0	
29.0	
89.0	
300.0	

EXECUTE RESULT	
mean	28.23
std	94.66
min	21
max	133182
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	87.0
%99,9 quantile	155.0

DELETE	RESULT
mean	30.77
std	69.31
min	23
max	18438
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	89.0
%99,9 quantile	278.0

GLOBAL RESULT	
mean	32.6
std	7553.94
min	21
max	24846528
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	26.0
%75 quantile	28.0
%99 quantile	88.0
%99,9 quantile	223.0

• Order-by-order: emhash7::HashMap

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

ADD RESULT	
mean	51.6
std	17891.86
min	25
max	24084120
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	237.0

EXECUTE RESULT	
mean	27.99
std	94.1
min	21
max	47424
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	26.0
%99 quantile	88.0
%99,9 quantile	198.0

DELETE RESULT	
mean	30.71
std	70.51
min	24
max	23365
%1 quantile	26.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	307.0

GLOBAL RESULT		
mean	32.38	
std	7304.79	
min	21	
max	24084120	
%1 quantile	24.0	
%25 quantile	25.0	
%50 quantile	26.0	
%75 quantile	28.0	
%99 quantile	88.0	
%99,9 quantile	231.0	

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

ADD RESULT	
mean	51.8
std	18326.05
min	24
max	24416013
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	196.0

EXECUTE RESULT	
mean	28.16
std	82.82
min	21
max	26266
%1 quantile	23.0
%25 quantile	25.0
%50 quantile	27.0
%75 quantile	27.0
%99 quantile	88.0
%99,9 quantile	211.0

DELETE RESULT	
mean	29.78
std	60.01
min	24
max	20169
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	89.0
%99,9 quantile	201.0

GLOBAL RESULT	
mean	32.37
std	7481.93
min	21
max	24416013
%1 quantile	23.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	88.0
%99,9 quantile	207.0

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

ADD RESULT	
65.37	
17756.25	
36	
23936008	
39.0	
40.0	
43.0	
44.0	
97.0	
235.0	

EXECUTE RESULT	
mean	36.54
std	86.61
min	28
max	32155
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	35.0
%75 quantile	36.0
%99 quantile	94.0
%99,9 quantile	232.0

DELETE	RESULT
mean	42.02
std	66.51
min	34
max	17926
%1 quantile	37.0
%25 quantile	38.0
%50 quantile	40.0
%75 quantile	41.0
%99 quantile	99.0
%99,9 quantile	191.0

GLOBAL RESULT	
mean	42.26
std	7249.36
min	28
max	23936008
%1 quantile	32.0
%25 quantile	34.0
%50 quantile	36.0
%75 quantile	41.0
%99 quantile	96.0
%99,9 quantile	227.0

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

ADD RESULT	
mean	62.35
std	25655.97
min	28
max	34974300
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	32.0
%99 quantile	57.0
%99,9 quantile	176.0

EXECUTE RESULT	
mean	29.28
std	87.74
min	22
max	23488
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	28.0
%99 quantile	90.0
%99,9 quantile	190.0

DELETE	RESULT
mean	30.21
std	53.38
min	24
max	18761
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	91.0
%99,9 quantile	185.0

GLOBAL	RESULT
mean	34.95
std	10474.28
min	22
max	34974300
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	89.0
%99,9 quantile	186.0

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

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

ADD RESULT	
mean	62.92
std	25711.84
min	29
max	34915696
%1 quantile	31.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	57.0
%99,9 quantile	152.0

27.85 84.23
01.33
04.23
23
24196
24.0
25.0
26.0
26.0
89.0
232.0

DELETE RESULT	
mean	31.76
std	76.3
min	26
max	21100
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	91.0
%99,9 quantile	153.0

GLOBAL RESULT		
mean	34.35	
std	10497.09	
min	23	
max	34915696	
%1 quantile	25.0	
%25 quantile	25.0	
%50 quantile	26.0	
%75 quantile	30.0	
%99 quantile	88.0	
%99,9 quantile	214.0	

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

• Grouped-by-price: hrd7::hash\_map

ADD RESULT	
mean	65.48
std	25636.91
min	28
max	34935711
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	37.0
%99 quantile	63.0
%99,9 quantile	223.0

EXECUTE RESULT	
mean	32.78
std	90.53
min	24
max	26522
%1 quantile	27.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	93.0
%99,9 quantile	190.0

DELETE RESULT	
mean	35.65
std	76.73
min	27
max	23373
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	96.0
%99,9 quantile	205.0

GLOBAL RESULT	
mean	38.71
std	10466.54
min	24
max	34935711
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	35.0
%99 quantile	93.0
%99,9 quantile	196.0

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

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

ADD RESULT	
mean	64.72
std	25619.19
min	29
max	34939304
%1 quantile	32.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	35.0
%99 quantile	59.0
%99,9 quantile	193.0

EXECUTE RESULT	
mean	31.32
std	83.83
min	24
max	22687
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	92.0
%99,9 quantile	143.0

DELETE RESULT	
mean	34.91
std	139.1
min	27
max	122709
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	95.0
%99,9 quantile	178.0

GLOBAL RESULT	
mean	37.48
std	10459.38
min	24
max	34939304
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	33.0
%99 quantile	92.0
%99,9 quantile	158.0

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

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

ADD RESULT	
mean	64.21
std	25738.58
min	29
max	35105310
%1 quantile	32.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	60.0
%99,9 quantile	166.0

EXECUTE RESULT	
mean	31.07
std	94.52
min	24
max	26585
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	93.0
%99,9 quantile	242.0

DELETE RESULT	
mean	36.06
std	76.96
min	29
max	20012
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	35.0
%99 quantile	98.0
%99,9 quantile	149.0

GLOBAL RESULT	
mean	37.43
std	10508.07
min	24
max	35105310
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	30.0
%75 quantile	33.0
%99 quantile	93.0
%99,9 quantile	223.0

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

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

ADD RESULT	
mean	68.91
std	25814.31
min	29
max	35152737
%1 quantile	33.0
%25 quantile	35.0
%50 quantile	36.0
%75 quantile	42.0
%99 quantile	61.0
%99,9 quantile	169.0

EXECUTE RESULT	
mean	36.84
std	94.24
min	25
max	28441
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	33.0
%75 quantile	39.0
%99 quantile	97.0
%99,9 quantile	239.0

DELETE RESULT	
mean	37.89
std	60.28
min	27
max	18056
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	40.0
%99 quantile	97.0
%99,9 quantile	135.0

GLOBAL RESULT	
mean	42.36
std	10538.96
min	25
max	35152737
%1 quantile	30.0
%25 quantile	32.0
%50 quantile	34.0
%75 quantile	40.0
%99 quantile	96.0
%99,9 quantile	204.0

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

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

ADD RESULT	
mean	65.39
std	25549.26
min	29
max	34716696
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	35.0
%99 quantile	63.0
%99,9 quantile	191.0

EXECUTE RESULT	
mean	31.74
std	92.72
min	24
max	77678
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	93.0
%99,9 quantile	145.0

DELETE RESULT	
mean	36.46
std	71.4
min	28
max	26634
%1 quantile	32.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	35.0
%99 quantile	98.0
%99,9 quantile	287.0

GLOBAL RESULT	
mean	38.13
std	10430.76
min	24
max	34716696
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	34.0
%99 quantile	93.0
%99,9 quantile	189.0

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

ADD RESULT	
64.87	
25615.61	
29	
34870806	
31.0	
33.0	
34.0	
36.0	
58.0	
216.0	

EXECUTE RESULT	
mean	31.09
std	88.19
min	23
max	31875
%1 quantile	25.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	30.0
%99 quantile	92.0
%99,9 quantile	162.0

DELETE RESULT	
mean	32.9
std	51.37
min	25
max	19878
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	94.0
%99,9 quantile	167.0

GLOBAL RESULT	
mean	37.02
std	10457.81
min	23
max	34870806
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	33.0
%99 quantile	91.0
%99,9 quantile	170.0

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

ADD RESULT	
mean	66.57
std	25675.98
min	31
max	34853197
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	35.0
%75 quantile	37.0
%99 quantile	63.0
%99,9 quantile	211.0

EXECUTE RESULT	
mean	29.23
std	85.92
min	22
max	25356
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	90.0
%99,9 quantile	185.0
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DELETE RESULT	
mean	31.25
std	58.74
min	25
max	18045
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	92.0
%99,9 quantile	135.0

GLOBAL RESULT	
mean	35.79
std	10482.45
min	22
max	34853197
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	32.0
%99 quantile	90.0
%99,9 quantile	184.0

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

ADD RESULT	
mean	68.78
std	26726.92
min	31
max	35156248
%1 quantile	34.0
%25 quantile	35.0
%50 quantile	36.0
%75 quantile	37.0
%99 quantile	65.0
%99,9 quantile	259.0

EXECUTE RESULT	
mean	29.09
std	100.77
min	22
max	53397
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	91.0
%99,9 quantile	182.0

DELETE RESULT	
mean	31.49
std	60.58
min	25
max	18069
%1 quantile	28.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	92.0
%99,9 quantile	136.0

GLOBAL RESULT	
mean	36.1
std	10911.57
min	22
max	35156248
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	32.0
%99 quantile	90.0
%99,9 quantile	202.0

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

ADD RESULT	
mean	64.08
std	25846.1
min	29
max	35175773
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	57.0
%99,9 quantile	153.0

EXECUTE RESULT	
mean	29.11
std	84.11
min	22
max	26192
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	28.0
%75 quantile	28.0
%99 quantile	90.0
%99,9 quantile	182.0

DELETE RESULT	
mean	32.04
std	80.89
min	24
max	26393
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	93.0
%99,9 quantile	185.0

GLOBAL RESULT	
mean	35.43
std	10551.91
min	22
max	35175773
%1 quantile	24.0
%25 quantile	27.0
%50 quantile	28.0
%75 quantile	31.0
%99 quantile	90.0
%99,9 quantile	176.0

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

ADD RESULT	
mean	63.16
std	26819.22
min	28
max	36855077
%1 quantile	30.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	56.0
%99,9 quantile	163.0

EXECUTE RESULT	
mean	29.7
std	69.97
min	22
max	27964
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	90.0
%99,9 quantile	194.0

DELETE RESULT	
mean	30.22
std	47.65
min	24
max	18011
%1 quantile	26.0
%25 quantile	27.0
%50 quantile	29.0
%75 quantile	29.0
%99 quantile	92.0
%99,9 quantile	264.0

GLOBAL RESULT	
mean	35.36
std	10949.07
min	22
max	36855077
%1 quantile	25.0
%25 quantile	27.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	90.0
%99,9 quantile	213.0

• Order-by-order: tsl::hopscotch\_map

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

ADD RESULT	
mean	63.02
std	26271.5
min	29
max	35805973
%1 quantile	31.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	56.0
%99,9 quantile	149.0

EXECUTE RESULT	
mean	27.85
std	82.02
min	23
max	23326
%1 quantile	25.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	27.0
%99 quantile	89.0
%99,9 quantile	209.0
	l .

DELETE RESULT	
mean	32.08
std	60.76
min	27
max	18159
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	91.0
%99,9 quantile	188.0

GLOBAL RESULT	
mean	34.41
std	10725.54
min	23
max	35805973
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	30.0
%99 quantile	88.0
%99,9 quantile	196.0

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

ADD RESULT	
mean	65.91
std	26104.98
min	28
max	35570564
%1 quantile	31.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	36.0
%99 quantile	57.0
%99,9 quantile	211.0

EXECUTE RESULT	
EVECULE	RESULI
mean	31.93
std	79.44
min	23
max	26329
%1 quantile	26.0
%25 quantile	29.0
%50 quantile	29.0
%75 quantile	31.0
%99 quantile	93.0
%99,9 quantile	153.0

DELETE RESULT	
mean	34.18
std	57.01
min	27
max	26579
%1 quantile	30.0
%25 quantile	31.0
%50 quantile	32.0
%75 quantile	33.0
%99 quantile	95.0
%99,9 quantile	211.0

GLOBAL RESULT	
mean	37.97
std	10657.54
min	23
max	35570564
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	34.0
%99 quantile	92.0
%99,9 quantile	174.0

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

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

ADD RESULT	
mean	73.54
std	26257.31
min	32
max	35728467
%1 quantile	36.0
%25 quantile	38.0
%50 quantile	40.0
%75 quantile	47.0
%99 quantile	74.0
%99,9 quantile	173.0

EXECUTE RESULT	
mean	36.44
std	89.47
min	23
max	27197
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	32.0
%75 quantile	39.0
%99 quantile	96.0
%99,9 quantile	202.0

37.33
37.33
69.76
26
26109
30.0
32.0
33.0
40.0
97.0
136.0

GLOBAL RESULT	
mean	42.77
std	10719.8
min	23
max	35728467
%1 quantile	29.0
%25 quantile	31.0
%50 quantile	35.0
%75 quantile	40.0
%99 quantile	96.0
%99,9 quantile	179.0

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

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

ADD RESULT	
69.08	
28200.03	
30	
38712180	
33.0	
34.0	
36.0	
37.0	
57.0	
133.0	

EXECUTE RESULT	
mean	29.02
std	80.43
min	22
max	85894
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	90.0
%99,9 quantile	197.0

DELETE RESULT	
mean	32.88
std	94.18
min	25
max	26808
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	32.0
%99 quantile	93.0
%99,9 quantile	184.0

GLOBAL RESULT	
mean	36.34
std	11512.87
min	22
max	38712180
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	33.0
%99 quantile	90.0
%99,9 quantile	170.0

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

ADD RESULT	
mean	68.37
std	27034.05
min	30
max	37273712
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	36.0
%75 quantile	37.0
%99 quantile	59.0
%99,9 quantile	141.0

EXECUTE RESULT	
29.1	
72.94	
21	
26172	
24.0	
26.0	
27.0	
28.0	
90.0	
190.0	

DELETE RESULT	
mean	31.8
std	58.65
min	25
max	26654
%1 quantile	28.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	93.0
%99,9 quantile	157.0

GLOBAL RESULT	
mean	36.1
std	11036.8
min	21
max	37273712
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	33.0
%99 quantile	90.0
%99,9 quantile	170.0

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

• Grouped-by-price: tsl::robin\_map

ADD RESULT	
mean	64.24
std	25847.15
min	29
max	35252869
%1 quantile	31.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	56.0
%99,9 quantile	167.0

EXECUTE RESULT	
mean	29.52
std	114.71
min	22
max	153651
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	28.0
%75 quantile	28.0
%99 quantile	89.0
%99,9 quantile	198.0

DELETE RESULT	
mean	31.35
std	67.88
min	24
max	23595
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	29.0
%75 quantile	30.0
%99 quantile	92.0
%99,9 quantile	138.0

GLOBAL RESULT		
mean	35.61	
std	10552.51	
min	22	
max	35252869	
%1 quantile	24.0	
%25 quantile	27.0	
%50 quantile	28.0	
%75 quantile	31.0	
%99 quantile	89.0	
%99,9 quantile	182.0	

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

• Grouped-by-price: emhash7::HashMap

ADD RESULT	
mean	71.11
std	32285.13
min	30
max	43957335
%1 quantile	32.0
%25 quantile	32.0
%50 quantile	33.0
%75 quantile	33.0
%99 quantile	60.0
%99,9 quantile	147.0

EXECUTE RESULT	
mean	28.95
std	380.85
min	21
max	196940
%1 quantile	23.0
%25 quantile	24.0
%50 quantile	27.0
%75 quantile	27.0
%99 quantile	88.0
%99,9 quantile	141.0

DELETE RESULT	
mean	30.79
std	76.14
min	24
max	27827
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	28.0
%75 quantile	29.0
%99 quantile	91.0
%99,9 quantile	280.0

GLOBAL RESULT	
mean	36.28
std	13184.06
min	21
max	43957335
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	29.0
%99 quantile	88.0
%99,9 quantile	203.0

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

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

ADD RESULT	
mean	75.1
std	33715.8
min	32
max	45797056
%1 quantile	33.0
%25 quantile	34.0
%50 quantile	34.0
%75 quantile	35.0
%99 quantile	61.0
%99,9 quantile	232.0

EXECUTE RESULT	
mean	28.01
std	110.28
min	22
max	29087
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	26.0
%99 quantile	89.0
%99,9 quantile	221.0

DELETE RESULT	
mean	34.03
std	138.63
min	27
max	26363
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	93.0
%99,9 quantile	198.0

GLOBAL RESULT	
mean	36.86
std	13764.84
min	22
max	45797056
%1 quantile	24.0
%25 quantile	25.0
%50 quantile	26.0
%75 quantile	32.0
%99 quantile	89.0
%99,9 quantile	218.0

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

ADD RESULT	
mean	72.96
std	33415.24
min	31
max	45862210
%1 quantile	33.0
%25 quantile	33.0
%50 quantile	33.0
%75 quantile	34.0
%99 quantile	68.0
%99,9 quantile	168.0

EXECUTE RESULT	
32.83	
88.26	
24	
36295	
27.0	
30.0	
30.0	
31.0	
93.0	
187.0	

DELETE RESULT	
mean	33.7
std	61.36
min	27
max	26927
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	92.0
%99,9 quantile	152.0

GLOBAL RESULT	
mean	39.66
std	13641.93
min	24
max	45862210
%1 quantile	28.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	33.0
%99 quantile	93.0
%99,9 quantile	179.0

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

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

ADD RESULT	
mean	72.19
std	32184.92
min	32
max	43836192
%1 quantile	33.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	34.0
%99 quantile	61.0
%99,9 quantile	232.0

EXECUTE RESULT	
mean	28.55
std	77.75
min	22
max	38864
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	27.0
%99 quantile	89.0
%99,9 quantile	189.0

DELETE RESULT	
mean	32.16
std	85.42
min	25
max	27582
%1 quantile	28.0
%25 quantile	29.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	92.0
%99,9 quantile	170.0

GLOBAL RESULT		
mean	36.42	
std	13139.65	
min	22	
max	43836192	
%1 quantile	24.0	
%25 quantile	26.0	
%50 quantile	27.0	
%75 quantile	32.0	
%99 quantile	90.0	
%99,9 quantile	190.0	

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

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

ADD RESULT	
mean	72.85
std	32247.16
min	32
max	43841005
%1 quantile	34.0
%25 quantile	34.0
%50 quantile	35.0
%75 quantile	35.0
%99 quantile	65.0
%99,9 quantile	263.0

EXECUTE RESULT	
mean	28.9
std	83.65
min	22
max	23347
%1 quantile	24.0
%25 quantile	26.0
%50 quantile	27.0
%75 quantile	28.0
%99 quantile	90.0
%99,9 quantile	188.0

DELETE RESULT	
mean	33.16
std	79.43
min	26
max	24319
%1 quantile	29.0
%25 quantile	30.0
%50 quantile	31.0
%75 quantile	32.0
%99 quantile	94.0
%99,9 quantile	218.0
%99,9 quantile	218.0

GLOBAL RESULT	
mean	36.93
std	13165.07
min	22
max	43841005
%1 quantile	25.0
%25 quantile	26.0
%50 quantile	28.0
%75 quantile	32.0
%99 quantile	90.0
%99,9 quantile	206.0

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

ADD RESULT	
mean	73.48
std	32909.56
min	32
max	43845526
%1 quantile	33.0
%25 quantile	33.0
%50 quantile	34.0
%75 quantile	34.0
%99 quantile	60.0
%99,9 quantile	176.0

EXECUTE RESULT		
mean	27.74	
std	54.88	
min	22	
max	25178	
%1 quantile	23.0	
%25 quantile	24.0	
%50 quantile	27.0	
%75 quantile	27.0	
%99 quantile	88.0	
%99,9 quantile	145.0	

DELETE RESULT	
mean	32.36
std	142.89
min	24
max	26422
%1 quantile	27.0
%25 quantile	28.0
%50 quantile	30.0
%75 quantile	31.0
%99 quantile	92.0
%99,9 quantile	209.0

GLOBAL RESULT		
mean	36.14	
std	13435.48	
min	22	
max	43845526	
%1 quantile	24.0	
%25 quantile	26.0	
%50 quantile	27.0	
%75 quantile	30.0	
%99 quantile	89.0	
%99,9 quantile	165.0	