

Where does the time actually go? 32 benchmarks, LOGOS vs C

perf userspace CPU sampling, loader/thread startup trimmed. printf/formatting = 0%% on 30/32; malloc = 0%% on 31/32. Real stdout = 1 write() syscall per run.
Each benchmark has two bars: top = LOGOS, bottom = C. GREEN = the actual algorithm on-CPU. Both green => a fair compute benchmark.



* LOGOS compiler-optimizes this (memoization / closed form): finishes in <0.01s (vs C's full run), so its runtime is process startup, not the algorithm - still 0%% malloc, 0%% printf.

fib - LOGOS vs C (n = 43)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 100.0% C 0.0% compute: L 0.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

startup 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

LOGOS compiler-optimizes this (memoized): finishes in <0.01s (vs C's full run) - nothing to profile, its whole runtime is process startup. Still 0% malloc, 0% printf.



ackermann - LOGOS vs C (n = 12)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 100.0% C 0.0% compute: L 0.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

startup 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

LOGOS compiler-optimizes this (memoized): finishes in <0.01s (vs C's full run) - nothing to profile, its whole runtime is process startup. Still 0% malloc, 0% printf.



nqueens - LOGOS vs C (n = 14)

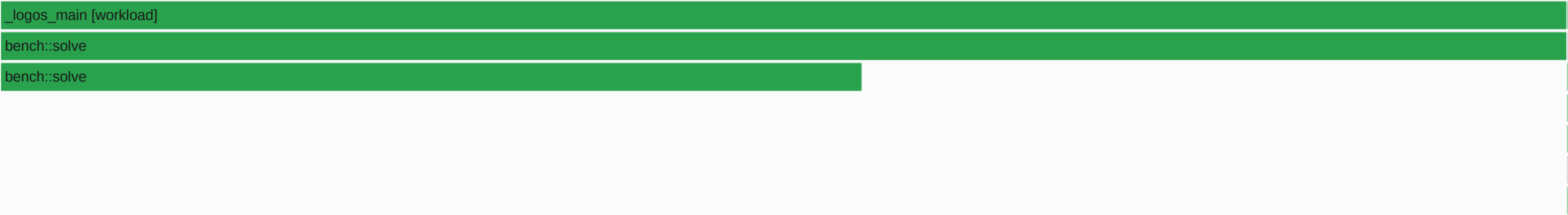
malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write()) syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



bubble_sort - LOGOS vs C (n = 158,048)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

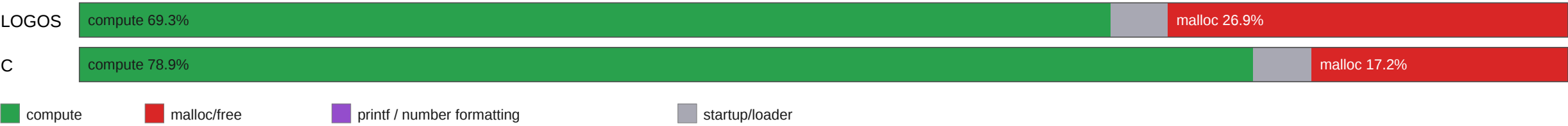
flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

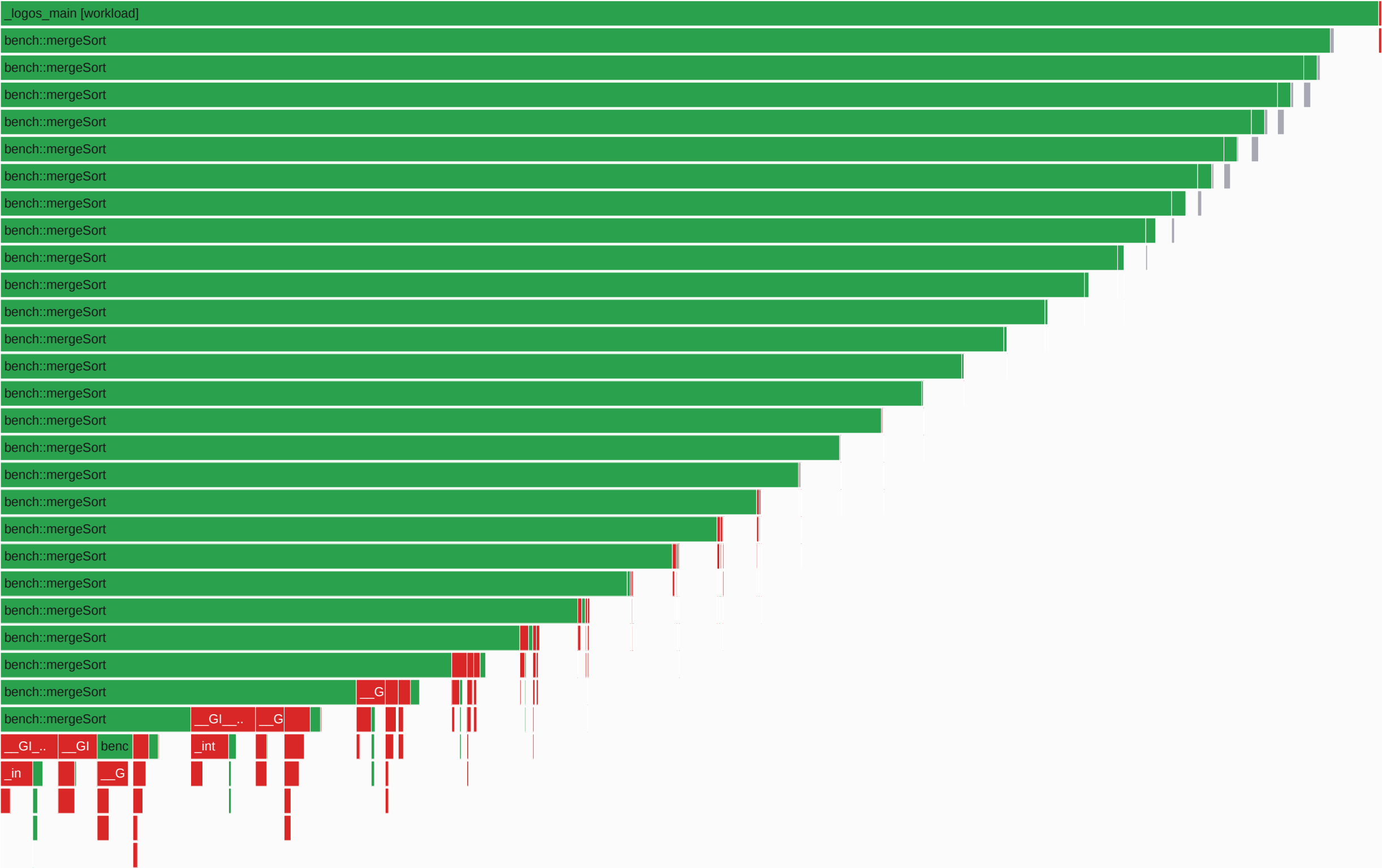
mergesort - LOGOS vs C (n = 49,232,280)

malloc: L 26.9% C 17.2% printf/fmt: L 0.0% C 0.0% startup/loader: L 3.8% C 3.9% compute: L 69.3% C 78.9%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



quicksort - LOGOS vs C (n = 52,276,512)

counting_sort - LOGOS vs C (n = 565,125,712)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 7.0% C 3.3% compute: L 93.0% C 96.7%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



heap_sort - LOGOS vs C (n = 43,416,918)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.1% C 0.1% compute: L 99.9% C 99.9%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



nbody - LOGOS vs C (n = 165,292,488)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

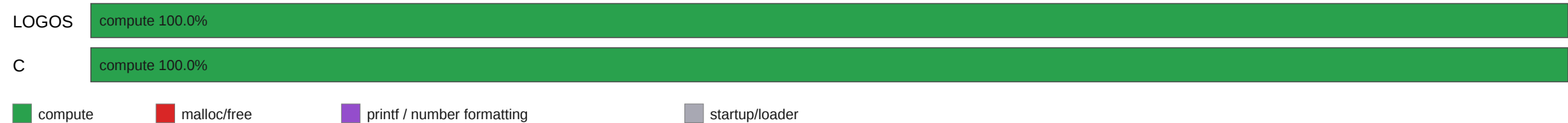
flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



mandelbrot - LOGOS vs C (n = 15,024)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



spectral_norm - LOGOS vs C (n = 17,032)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.1% C 0.0% compute: L 99.9% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



pi_leibniz - LOGOS vs C (n = 5,833,224,944)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

gcd - LOGOS vs C (n = 53,096)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

collatz - LOGOS vs C (n = 29,177,848)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

primes - LOGOS vs C (n = 22,704,512)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



sieve - LOGOS vs C (n = 620,366,640)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.2% C 0.3% compute: L 99.8% C 99.7%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



matrix_mult - LOGOS vs C (n = 1,930)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.1% compute: L 100.0% C 99.9%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 99.9%

 compute  malloc/free  printf / number formatting  startup/loader

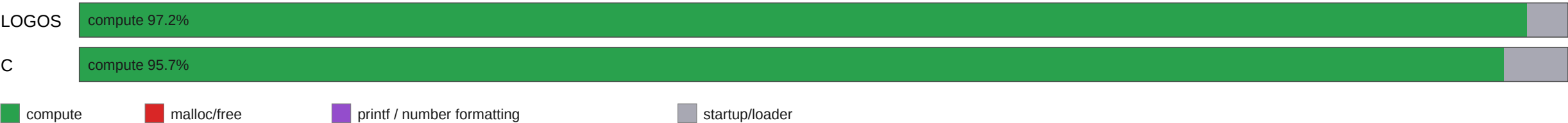
flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

prefix_sum - LOGOS vs C (n = 779,157,567)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 2.8% C 4.3% compute: L 97.2% C 95.7%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



array_reverse - LOGOS vs C (n = 976,661,336)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 10.5% C 7.4% compute: L 89.5% C 92.6%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



array_fill - LOGOS vs C (n = 892,824,960)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 3.1% C 6.7% compute: L 96.9% C 93.3%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



■ compute ■ malloc/free ■ printf / number formatting ■ startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



collect - LOGOS vs C (n = 95,229,680)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 17.6% C 4.9% compute: L 82.4% C 95.1%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



two_sum - LOGOS vs C (n = 318,601,448)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 6.0% C 1.7% compute: L 94.0% C 98.3%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



histogram - LOGOS vs C (n = 2,386,643,440)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

knapsack - LOGOS vs C (n = 73,136)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

coins - LOGOS vs C (n = 803,436,736)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 3.5% C 4.8% compute: L 96.5% C 95.2%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



fannkuch - LOGOS vs C (n = 10)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.4% compute: L 100.0% C 99.6%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

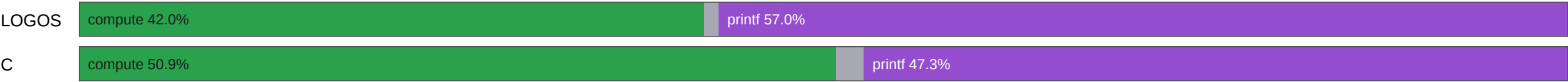
flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



strings - LOGOS vs C (n = 143,865,304)

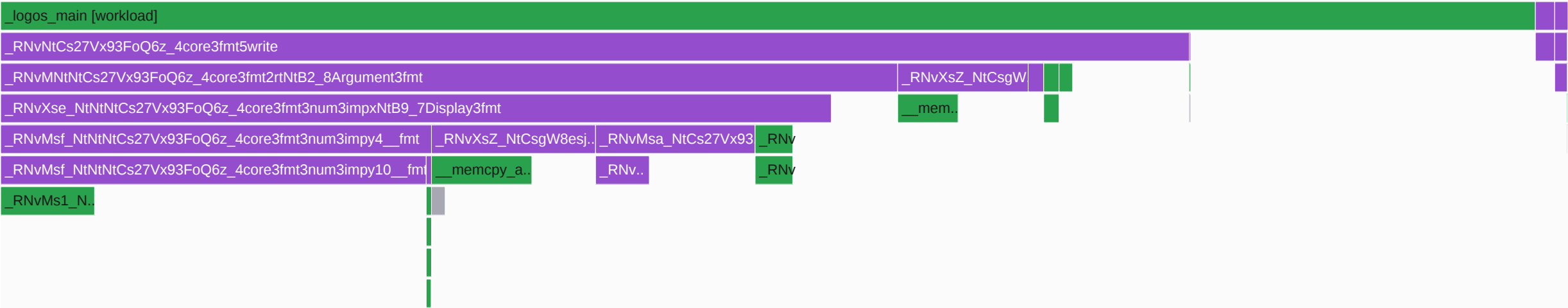
malloc: L 0.0% C 0.0% printf/fmt: L 57.0% C 47.3% startup/loader: L 1.0% C 1.9% compute: L 42.0% C 50.9%

(real stdout output is a write()) syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

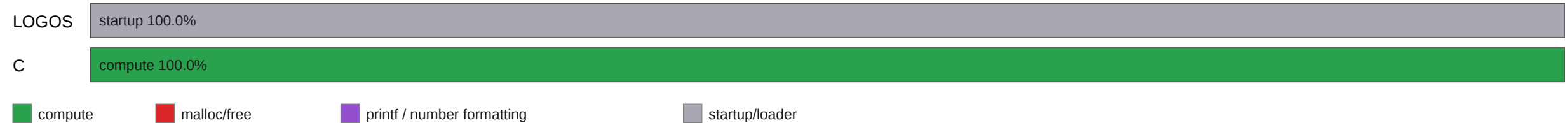
flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



binary_trees - LOGOS vs C (n = 23)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 100.0% C 0.0% compute: L 0.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



LOGOS compiler-optimizes this (closed-form): finishes in <0.01s (vs C's full run) - nothing to profile, its whole runtime is process startup. Still 0% malloc, 0% printf.



loop_sum - LOGOS vs C (n = 1,918,787,688)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

fib_iterative - LOGOS vs C (n = 1,934,869,816)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 0.0% C 0.0% compute: L 100.0% C 100.0%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)

LOGOS

compute 100.0%

C

compute 100.0%

 compute  malloc/free  printf / number formatting  startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

_logos_main [workload]

graph_bfs - LOGOS vs C (n = 48,172,599)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 1.4% C 1.6% compute: L 98.6% C 98.4%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time



string_search - LOGOS vs C (n = 3,699,858,416)

malloc: L 0.0% C 0.0% printf/fmt: L 0.0% C 0.0% startup/loader: L 2.5% C 2.6% compute: L 97.5% C 97.4%

(real stdout output is a write() syscall: 1-2 per whole run - see benchmarks/PROFILE.md; the purple above is in-memory number formatting)



compute malloc/free printf / number formatting startup/loader

flamegraph = LOGOS on-CPU stacks (loader/thread startup trimmed); width = share of CPU time

