

Benchmark	Time	Instructions	Rel to Start	Rel to Prev	Improvement
Small	16.91	$5.369 \times 10^{10}$	100.00%	100.00%	No improvement (starting point)
Adventure	150.68	-	100.00%	100.00%	
Big	420.98	-	100.00%	100.00%	
Small	9.89	$4.737 \times 10^{10}$	58.49%	58.49%	Compiled with optimization O1 turned on and linked against -lcii-O1
Adventure	87.59	-	58.13%	58.13%	
Big	246.55	-	58.57%	58.57%	
Small	8.84	$4.730 \times 10^{10}$	52.28%	89.38%	Compiled with optimization O2 turned on and linked against -lcii-O2
Adventure	78.92	-	52.38%	90.10%	
Big	220.42	-	52.36%	89.40%	
Small	8.34	$4.424 \times 10^{10}$	49.32%	94.34%	Put contents of .c files in header files to allow compiler to do more optimizing
Adventure	73.83	-	49.00%	93.55%	
Big	208.37	-	49.50%	94.53%	
Small	4.28	$2.386 \times 10^{10}$	25.31%	51.32%	Put all code in one .c file & remove asserts for failure modes, as well as function and function parameters that become obsolete with failure mode asserts removed
Adventure	39.24	-	26.04%	53.15%	
Big	106.84	-	25.38%	51.27%	
Small	2.36	$9.207 \times 10^9$	13.96%	55.14%	Combine the logic in Bitpack to remove helper function calls
Adventure	20.63	-	13.69%	52.57%	
Big	59.68	-	14.18%	55.86%	
Small	2.34	$9.167 \times 10^9$	13.84%	99.15%	Remove excessive um helper function calls in the handle_instruction switch statement
Adventure	20.34	-	13.50%	98.59%	
Big	59.07	-	14.03%	98.98%	
Small	1.66	$6.360 \times 10^9$	9.82%	70.94%	Remove the seq_get call at the beginning of the machine cycle that checks if the program counter is in bounds of segment 0 (listed failure mode, can behave unpredictably)
Adventure	16.01	-	10.63%	78.71%	
Big	42.17	-	10.02%	71.39%	
Small	0.62	$3.403 \times 10^9$	3.67%	37.35%	Replaced the sequence of segment line structs with a simpler array of structs
Adventure	4.86	-	3.23%	30.36%	
Big	16.3	-	3.87%	38.65%	
Small	0.52	$2.892 \times 10^9$	3.08%	83.87%	Take the line structs off of the heap to remove malloc'ing and freeing them
Adventure	3.98	-	2.64%	81.89%	
Big	12.98	-	3.08%	79.63%	
Small	0.48	$2.807 \times 10^9$	2.84%	92.31%	take the segmented memory off the heap as well
Adventure	3.71	-	2.46%	93.22%	
Big	12.13	-	2.88%	93.45%	
Small	0.46	$2.751 \times 10^9$	4.65%	95.83%	replaced the sequence tracking the unmapped segments with an array
Adventure	3.65	-	4.17%	98.38%	
Big	11.82	-	4.79%	97.44%	
Small	0.4	$2.573 \times 10^9$	2.37%	86.96%	removed asserts in bitpack, as well as made all static functions static inline
Adventure	3.24	-	2.15%	88.77%	
Big	10.35	-	2.46%	87.56%	
Small	0.4	$2.468 \times 10^9$	2.37%	100.00%	removed the bitpack new function and manually did shifting to create word
Adventure	3.19	-	2.12%	98.46%	
Big	10.26	-	2.44%	99.13%	