(a) a1msort.cpp / a2msort.cpp(refined)

bsd1 [/u/cs/100/0016046] -pstsai- sh a1pmsort 1000000 => 0.2033s

%	cumulative	self		self	total	
time	seconds	seconds	calls	ms/call	ms/call	name
90.73	0.21	0.21	999999	0.00	0.00	merge(int*, int, int, int)
4.80	0.22	0.01	1	10.95	218.07	msort(int*, int, int)
90.64	0.20	0.20	999999	0.00	0.00	merge(int*, int, int, int)
5.60	0.21	0.01	1	12.43	213.76	msort(int*, int, int)
90.70	0.20	0.20	999999	0.00	0.00	merge(int*, int, int, int)
4.57	0.21	0.01	1	10.21	213.02	msort(int*, int, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh a1pmsort 10000000 => 2.4s

%	cumulative	self		self	total	
time	seconds	seconds	calls	s/call	s/call	name
90.33	2.44	2.44	9999999	0.00	0.00	merge(int*, int, int, int)
4.23	2.55	0.11	1	0.11	2.55	msort(int*, int, int)
88.89	2.38	2.38	9999999	0.00	0.00	merge(int*, int, int, int)
4.51	2.50	0.12	1	0.12	2.50	msort(int*, int, int)
89.43	2.38	2.38	9999999	0.00	0.00	merge(int*, int, int, int)
4.17	2.50	0.11	1	0.11	2.50	msort(int*, int, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh a2pmsort 1000000 => 0.14s

%	cumulative	self		self	total	
time	seconds	seconds	calls	ms/call	ms/call	name
79.12	0.14	0.14	999999	0.00	0.00	merge(int*, int*, int, int, int, int)
9.09	0.15	0.02	1	15.75	152.84	msort(int*, int*, int, int, int)
85.47	0.14	0.14	999999	0.00	0.00	merge(int*, int*, int, int, int, int)
7.38	0.15	0.01	1	11.81	148.66	msort(int*, int*, int, int, int)
76.01	0.14	0.14	999999	0.00	0.00	merge(int*, int*, int, int, int, int)
7.30	0.17	0.01	1	13.29	151.74	msort(int*, int*, int, int, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh a2pmsort 10000000 => 1.6133s

%	cumulative	self		self	total	
time	seconds	seconds	calls	s/call	s/call	name
84.78	1.61	1.61	9999999	0.00	0.00	merge(int*, int*, int, int, int, int)
6.86	1.74	0.13	1	0.13	1.74	msort(int*, int*, int, int, int)
84.58	1.63	1.63	9999999	0.00	0.00	merge(int*, int*, int, int, int, int)
6.60	1.76	0.13	1	0.13	1.76	msort(int*, int*, int, int, int)
84.64	1.60	1.60	9999999	0.00	0.00	merge(int*, int*, int, int, int, int)
6.80	1.73	0.13	1	0.13	1.73	msort(int*, int*, int, int, int)

(0.2033-0.14)/0.2033=31.14%

(2.4-1.6133)/2.4=32.78%

$T(10^6)=c*(10^6 \lg 10^6)=0.14 \Rightarrow c=0.14/(10^6 \lg 10^6)=0.14/(1000000*19.93)=7.0241^{-9}$

$T(10^7)=c*(10^7 \lg 10^7)=1.6133 \Rightarrow c=1.6133/(10^7 \lg 10^7)=1.6133/(10000000*23.25)=6.938*10^{-9}$

$c=6.98105*10^{-9}$

(b) b1isort.cpp / b2isort.cpp(refined)

bsd1 [/u/cs/100/0016046] -pstsai- sh b1pisort 10000 => 0.29s

% time	cumulative seconds	self seconds	calls	self ms/call	total ms/call	name
100.00	0.29	0.29	1	293.63	293.63	isort(int*, int)
100.00	0.29	0.29	1	294.98	294.98	isort(int*, int)
100.00	0.29	0.29	1	290.79	290.79	isort(int*, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh b1pisort 100000 => 21.7433s

% time	cumulative seconds	self seconds	calls	self s/call	total s/call	name
100.00	21.54	21.54	1	21.54	21.54	isort(int*, int)
100.00	22.02	22.02	1	22.02	22.02	isort(int*, int)
100.00	21.67	21.67	1	21.67	21.67	isort(int*, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh b2pisort 10000 => 0.22s

% time	cumulative seconds	self seconds	calls	self ms/call	total ms/call	name
100.00	0.22	0.22	1	217.94	217.94	isort(int*, int)
100.00	0.22	0.22	1	221.02	221.02	isort(int*, int)
100.00	0.22	0.22	1	224.46	224.46	isort(int*, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh b2pisort 100000 => 15.22s

% time	cumulative seconds	self seconds	calls	self s/call	total s/call	name
100.00	15.30	15.30	1	15.30	15.30	isort(int*, int)
100.00	15.02	15.02	1	15.02	15.02	isort(int*, int)
100.00	15.34	15.34	1	15.34	15.34	isort(int*, int)

(0.29-0.22)/0.29=24.13%

(21.7433-15.22)/21.7433=30.00%

$T(10^4)=d*(10^4*10^4)=0.22 => d=0.22/(10000*10000)=2.2*10^{-9}$

$T(10^5)=d*(10^5*10^5)=15.22 => d=15.22/(100000*100000)=1.522*10^{-9}$

d=1.861^10-9

d*n*n>=c*n*lgn

1.861^~~10-9~~*n*n>=6.98105*~~10^-9~~*n*lgn

1.861n>=6.98105lgn

n>=14.2224 => n=15

(c) c1pmixed

bsd1 [/u/cs/100/0016046] -pstsai- sh c1pmixed 14

%	cumulative	self		self	total	
time	seconds	seconds	calls	Ts/call	Ts/call	name
0.00	0.00	0.00	1	0.00	0.00	isort(int*, int)
0.00	0.00	0.00	1	0.00	0.00	isort(int*, int)
0.00	0.00	0.00	1	0.00	0.00	isort(int*, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh c1pmixed 15

%	cumulative	self		self	total	
time	seconds	seconds	calls	Ts/call	Ts/call	name
0.00	0.00	0.00	14	0.00	0.00	merge(int*, int*, int, int, int, int)
0.00	0.00	0.00	14	0.00	0.00	merge(int*, int*, int, int, int, int)
0.00	0.00	0.00	14	0.00	0.00	merge(int*, int*, int, int, int, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh c1pmixed 1000000

%	cumulative	self		self	total	
time	seconds	seconds	calls	ms/call	ms/call	name
81.96	0.14	0.14	999999	0.00	0.00	merge(int*, int*, int, int, int, int)
8.73	0.15	0.01	1	14.77	153.46	msort(int*, int*, int, int, int)
84.45	0.14	0.14	999999	0.00	0.00	merge(int*, int*, int, int, int, int)
7.66	0.15	0.01	1	12.43	149.40	msort(int*, int*, int, int, int)
81.77	0.13	0.13	999999	0.00	0.00	merge(int*, int*, int, int, int, int)
7.90	0.14	0.01	1	12.43	141.03	msort(int*, int*, int, int, int)

bsd1 [/u/cs/100/0016046] -pstsai- sh c1pmixed 10000000

%	cumulative	self		self	total	
time	seconds	seconds	calls	s/call	s/call	name
83.88	1.65	1.65	9999999	0.00	0.00	merge(int*, int*, int, int, int, int)
6.79	1.78	0.13	1	0.13	1.78	msort(int*, int*, int, int, int)
84.28	1.64	1.64	9999999	0.00	0.00	merge(int*, int*, int, int, int, int)
6.58	1.76	0.13	1	0.13	1.76	msort(int*, int*, int, int, int)
84.20	1.60	1.60	9999999	0.00	0.00	merge(int*, int*, int, int, int, int)
6.88	1.74	0.13	1	0.13	1.74	msort(int*, int*, int, int, int)

Array size>=15 => 0%

Array size<15 => 理論上會減少時間