

Number of Threa	Upper Bound	Initialization Time	Prime Time	Sum	Uncesseary cross outs	
1	10	220672	10677	231349	2	
1	10	277445	13541	290986	2	
1	10	1338891	17813	1356704	2	
1	10	284268	13646	297914	2	
1	10	284580	14167	298747	2	
AVG		481171.2	13968.8	495140		
1	20	925451	21614	947065	7	
1	20	333278	20989	354267	7	
1	20	262601	14739	277340	7	
1	20	658430	15729	674159	7	
1	20	281872	15000	296872	7	
AVG		492326.4	17614.2	509940.6		
1	50	491358	30781	522139	28	
1	50	3473687	17968	3491655	28	
1	50	950257	14844	965101	28	
1	50	331197	22760	353957	28	
1	50	299947	24270	324217	28	
AVG		1109289.2	22124.6	1131413.8		
1	100	1159727	31198	1190925	72	
1	100	664004	31353	695357	72	
1	100	257445	30624	288069	72	
1	100	760043	40729	800772	72	

1	100	350986	40520	391506	72	
AVG		638441	34884.8	3366629		
1	200	279008	50989	329997	170	
1	200	666607	53537	720144	170	
1	200	389527	81874	471401	170	
1	200	771293	68906	840199	170	
1	200	345359	68228	413587	170	
AVG	200	490358.8	64706.8	555065.6		
1	500	1757078	124687	1881765	509	
1	500	2862178	81354	2943532	509	
1	500	1327964	128542	1456506	509	
1	500	335307	158644	493951	509	
1	500	254840	119269	374109	509	
AVG		1307473.4	122499.2	1429972.6		
1	1000	286977	243801	530778	1127	
1	1000	336401	319891	656292	1127	
1	1000	334526	322183	656709	1127	
1	1000	315256	269163	584419	1127	
1	1000	320100	322756	642856	1127	
AVG		318652	295558.8	614210.8		
1	10000	1305303	3752212	5057515	14301	
1	10000	2449825	29335081	31784906	14301	
1	10000	2308784	3829501	6138285	14301	

1	10000	328539	2813780	3142319	14301	
1	10000	332966	3757625	4090591	14301	
AVG		1345083.4	8697639.8	10042723.2		
1	100000	893273	36853736	37747009	166401	
1	100000	800097	39109115	39909212	166401	
1	100000	857075	36479501	37336576	166401	
1	100000	1612849	36317883	37930732	166401	
1	100000	1073792	40801483	41875275	166401	
AVG		1047417.2	37912343.6	38959760.8		
1	500000	3570120	226755049			
1	500000	4643250	227987356			
1	500000	4022152	224278215			
1	500000	4964447	200492060			
1	500000	4994915	232540341			
AVG		4438976.8	222410604.2	226849581		
1	1000000	9145463	407709873		1853709	
1	1000000	6174707	426192204			
1	1000000	8587324	414794691			
1	1000000	89036576	932885488			
1	1000000	8060328	417959141			
AVG		24200879.6	519908279.4	544109159		
4	10	8409808	17447	8427255	2	
4	10	15083367	13646	15097013	2	

4	10	3416473	12604	3429077	2	
4	10	5874179	18906	5893085	2	
4	10	8039818	11562	8051380	2	
AVG		8164729	14833	8179562		
4	20	8319117	13177	8332294	7	
4	20	17401662	16667	17418329	7	
4	20	16274062	17813	16291875	7	
4	20	4794090	15260	4809350	7	
4	20	12692937	16146	12709083	7	
AVG		11896373.6	15812.6	11912186.2		
4	50	8338589	17083	8355672	28	
4	50	14065574	15469	14081043	28	
4	50	5110523	24739	5135262	28	
4	50	7495778	15885	7511663	28	
4	50	13840260	17343	13857603	28	
AVG		9770144.8	18103.8	9788248.6		
4	100	9144813	7161433	16306246	75	
4	100	1379202	17916	1397118	72	
4	100	4514713	15573	4530286	72	
4	100	19885151	17552	19902703	72	
4	100	10631343	15521	10646864	72	
AVG		9111044.4	1445599	10556643.4		
4	200	10129607	11510	10141117	170	

4	200	10345391	17240	10362631	170	
4	200	6369762	12344	6382106	170	
4	200	6992728	10260	7002988	170	
4	200	3123579	36667	3160246	170	
AVG		7392213.4	17604.2	7409817.6		
4	500	14830739	17813	14848552	509	
4	500	6564418	10417	6574835	509	
4	500	4651978	10260	4662238	509	
4	500	4253849	14896	4268745	509	
4	500	5030319	15260	5045579	509	
AVG		7066260.6	13729.2	7079989.8		
4	1000	8655389	10105	8665494	1127	
4	1000	8638879	14270	8653149	1127	
4	1000	6265458	14063	6279521	1127	
4	1000	5069835	13958	5083793	1127	
4	1000	12229146	15417	12244563	1127	
AVG		8171741.4	13562.6	8185304		
4	10000	14828458	1802861	16631319	14301	
4	10000	8978783	18559700	27538483	14301	
4	10000	14498354	1262081	15760435	14301	
4	10000	8841335	11771693	20613028	14301	
4	10000	8437585	1209789	9647374	14301	
AVG		11116903	6921224.8	18038127.8		

4	100000	7445348	37458196	44903544	166401	
4	100000	8273679	57199869	65473548	166401	
4	100000	9782009	35769396	45551405	166401	
4	100000	14928924	51710973	66639897	166401	
4	100000	14368821	56567524	70936345	166401	
AVG		10959756.2	47741191.6	58700947.8		
4	500000	6641965	335073091		900141	
4	500000	7313418	265658765		900141	
4	500000	17476445	299836738		900141	
4	500000	7511879	383051740		900141	
4	500000	7125372	404608910		900141	
AVG		9213815.8	337645848.8	346859664.6		
4	1000000	9549633	655902013		1853709	
4	1000000	8567323	618555705		1853709	
4	1000000	8478259	727316468		1853709	
4	1000000	9250799	631740801		1853709	
4	1000000	7206535	574215725		1853709	
AVG		8610509.8	641546142.4	650156652.2		
8	10	62429384	4791759	67221143	2	
8	10	67583225	10689610	78272835	2	
8	10	77306067	6575974	83882041	2	
8	10	73421493	14437049	87858542	2	

8	10	59839963	14284341	74124304	2	
AVG		68116026.4	10155746.6	78271773		
8	20	72119578	9855643	81975221	7	
8	20	71157568	5623649	76781217	7	
8	20	88313152	17539330	105852482	7	
8	20	60847035	3766530	64613565	7	
8	20	57092901	6783380	63876281	7	
AVG		69906046.8	8713706.4	78619753.2		
8	50	65337466	5199396	70536862	28	
8	50	67598131	3937320	71535451	28	
8	50	80461804	3721383	84183187	28	
8	50	58234544	10619831	68854375	28	
8	50	67378552	10278115	77656667	28	
AVG		67802099.4	6751209	74553308.4		
8	100	63899998	4477061	68377059	72	
8	100	66590959	3799648	70390607	72	
8	100	56566048	18881095	75447143	72	
8	100	62799885	9155503	71955388	72	
8	100	75732772	15976412	91709184	72	
AVG		65117932.4	10457943.8	75575876.2		
				0		
8	200	67763424	7966588	75730012	170	
8	200	70711257	4166070	74877327	170	
8	200	67265665	2483909	69749574	170	

8	200	83978258	6541020	90519278	170	
8	200	61253282	4565401	65818683	170	
AVG		70194377.2	5144597.6	75338974.8	170	
8	500	66935809	5872688	72808497	509	
8	500	89611980	5900917	95512897	509	
8	500	82428671	6407061	88835732	509	
8	500	78800198	6120552	84920750	509	
8	500	86343298	5171701	91514999	509	
AVG		80823991.2	5894583.8	86718575		
				0		
				0		
8	1000	88461409	7836796	96298205	1127	
8	1000	96950651	8246586	105197237	1127	
8	1000	73283806	10675327	83959133	1127	
8	1000	74832603	13940941	88773544	1127	
8	1000	65542475	7971222	73513697	1127	
AVG		79814188.8	9734174.4	89548363.2		
8	10000	88228765	9885754	98114519	14301	
8	10000	90442459	9612721	100055180	14301	
8	10000	103200065	4919855	108119920	14301	
8	10000	100123333	8284344	108407677	14301	
8	10000	93883161	9037728	102920889	14301	
AVG		95175556.6	8348080.4	103523637		
8	100000	86712323	65108044	151820367	166401	

8	100000	75199594	25802763	101002357	166401	
8	100000	73197371	46956391	120153762	166401	
8	100000	76119854	31380348	107500202	166401	
8	100000	121565125	26428731	147993856	166401	
AVG		86558853.4	39135255.4	125694108.8	166401	
8	500000	62823094	473749950		900141	
8	500000	73442776	519869893			
8	500000	82204031	517641255			
8	500000	47057911	486128202			
8	500000	69238859	478561200			
AVG		66953334.2	495190100	562143434.2		
8	1000000	68746778	1008007133		1853709	
8	1000000	64520781	1036971138			
8	1000000	75615387	1078397390			
8	1000000	64989258	976270832			
8	1000000	81909791	1048195125			
AVG		71156399	1029568324	1100724723		

Number of Threa	Upper Bound	Initialization Time	Prime Time	Total Time	Unnecessary
1	10	6491352	31822	6523174	2
1	10	1939844	26406	1966250	2
1	10	2257761	33854	2291615	2
1	10	1285573	17708	1303281	2
1	10	5389845	14114	5403959	2
AVG		3472875	24780.8	3497655.8	2
1	20	298698	24792	323490	7
1	20	1334167	18490	1352657	7
1	20	293073	18490	311563	7
1	20	282083	13750	295833	7
1	20	337292	14375	351667	7
AVG		509062.6	17979.4	527042	7
1	50	2241927	14844		28
1	50	1106927	15886		28
1	50	326823	19739		28
1	50	359844	20156		28
1	50	287552	15521		28
AVG		864614.6	17229.2	881843.8	28
1	100	314528	19115		72
1	100	682182	18958		72
1	100	404528	24844		72
1	100	291040	17968		72
1	100	295206	18177		72

AVG		397496.8	19812.4	417309.2	72
1	200	318382	33333		170
1	200	345830	31719		170
1	200	1067334	25677		170
1	200	280831	23594		170
1	200	287367	24114		170
AVG		459948.8	27687.4	487636.2	170
1	500	33381	55729		509
1	500	410359	55624		509
1	500	354996	54895		509
1	500	258695	42187		509
1	500	287705	40312		509
AVG		269027.2	49749.4	318776.6	509
1	1000	1216024	114998		1127
1	1000	644998	68854		1127
1	1000	290728	69762		1127
1	1000	308436	71041		1127
1	1000	416456	104374		1127
AVG		575328.4	85805.8	661134.2	1127
1	10000	375775	602595		14301
1	10000	959412	798634		14301
1	10000	1135242	645928		14301
1	10000	723739	601866		14301

1	10000	1486488	902642		14301
AVG		936131.2	710333	1646464.2	14301
1	100000	1067396	9644480		166401
1	100000	3182397	8355834		166401
1	100000	1054167	8876563		166401
1	100000	3249792	8122761		166401
1	100000	1045729	10882085		166401
AVG		1919896.2	9176344.6	11096240.8	
1	500000	4552870	78367528		41538
1	500000	6010146	87512582		
1	500000	5064842	85631284		
1	500000	6823469	86899649		
1	500000	4435786	82635890		
AVG		5377422.6	84209386.6	89586809.2	
1	1000000	9134231	160394155		
1	1000000	11881538	164621081		
1	1000000	10940454	167608176		
1	1000000	10820987	161705004		
1	1000000	8488605	154154507		
AVG		10253163	161696584.6	171949747.6	
4	10	6057530	790609		2
4	10	4027208	257651		2

4	10	5224424	10052		2
4	10	4646415	20572		2
4	10	2739275	12604		
AVG		4538970.4	218297.6	4757268	
4	20	6027387	14687		7
4	20	1958703	114789		7
4	20	3431167	12188		7
4	20	9030565	19114		7
4	20	3923969	14375		7
AVG		4874358.2	35030.6	4909388.8	
4	50	8133258	19479		28
4	50	7706814	37135		28
4	50	2878409	13385		28
4	50	5668982	21094		28
4	50	4833667	19635		28
AVG		5844226	22145.6	5866371.6	
4	100	8833753	14731		72
4	100	3057185	24062		72
4	100	4905403	24739		72
4	100	1318027	22968		72
4	100	2812507	15312		72
AVG		4185375	20362.4	4205737.4	
4	200	6922146	14635		170

4	200	5616164	21093		170
4	200	6598726	18645		170
4	200	3650989	27864		170
4	200	5894488	14791		170
AVG		5736502.6	19405.6	5755908.2	
4	500	5775991	15104		509
4	500	3844167	45469		509
4	500	1355729	44219		509
4	500	4915104	58907		509
4	500	3663490	45354		509
AVG		3910896.2	41810.6	3952706.8	
4	1000	9730626	15938		1127
4	1000	6055563	14792		1127
4	1000	4138542	16250		1127
4	1000	5923959	63854		1127
4	1000	5155209	91041		1127
AVG		6200779.8	40375	6241154.8	
4	10000	8473923	20208		14301
4	10000	8804949	354583		14301
4	10000	5792962	435204		14301
4	10000	8557137	588698		14301
4	10000	7750939	286041		14301
AVG		7875982	336946.8	8212928.8	

4	100000	9361981	220910575		166401
4	100000	8381355	4439897		166401
4	100000	6178907	24206409		166401
4	100000	14311617	15913595		166401
4	100000	7930053	36853390		166401
AVG		9232782.6	60464773.2	69697555.8	
4	500000	9669421	72620936		1
4	500000	13177660	67771299		
4	500000	10074051	67386546		
4	500000	7440748	70719652		
4	500000	5699777	79004348		
AVG		9212331.4	71500556.2	80712887.6	
4	1000000	9143816	147310055		1853709
4	1000000	9555021	143798876		
4	1000000	9932582	147750070		
4	1000000	9928534	148247830		
4	1000000	9506629	150100801		
AVG		9613316.4	147441526.4	157054842.8	
8	10	68606352	6252372		2
8	10	55158233	5122490		2
8	10	62703400	8152869		2

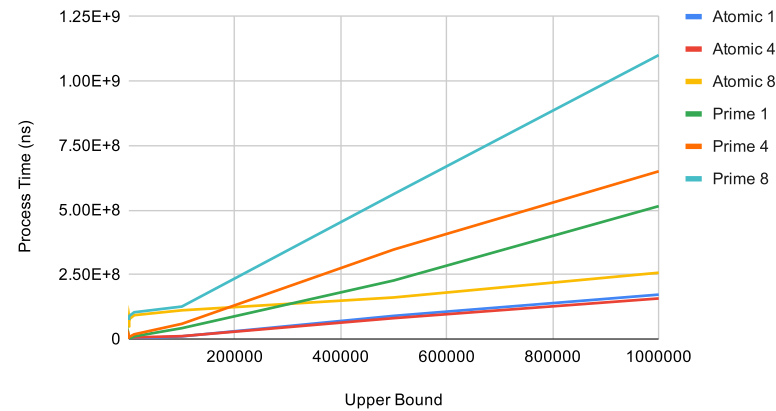
8	10	59824632	5270456		2
8	10	72715771	10834658		2
AVG		63801677.6	7126569	70928246.6	
8	20	64191617	12961999		
8	20	63379697	8181425		
8	20	74763066	21412275		
8	20	56187636	14317557		
8	20	59765148	8243350		
AVG		63657432.8	13023321.2	76680754	
8	50	58354764	4864746		
8	50	76554023	15089338		
8	50	61782130	9480485		
8	50	68678057	8434869		
8	50	69968463	10961721		
AVG		335337437	9766231.8	345103668.8	
8	100	56399068	8671543		
8	100	75927241	4841054		
8	100	61136059	8229464		
8	100	69270681	10553350		
8	100	63771922	4139445		
AVG		65300994.2	7286971.2	72587965.4	
8	200	68155359	6954634		
8	200	57111381	4703297		

8	200	80467034	13797080		
8	200	74945617	13395678		
8	200	79532677	5027878		
AVG		72042413.6	8775713.4	80818127	
8	500	56524540	9300402		
8	500	86620157	16405767		
8	500	69632622	21332138		
8	500	77503659	7660361		
8	500	67892529	8134785		
AVG		71634701.4	12566690.6	84201392	
8	1000	70631233	5310172		
8	1000	73707785	17091080		
8	1000	67254745	13905738		
8	1000	70339047	4379814		
8	1000	61089630	2274724		
AVG		68604488	8592305.6	77196793.6	
8	10000	77367456	14012407		14301
8	10000	61946673	15676719		
8	10000	99953974	8668485		
8	10000	76135642	14280999		
8	10000	78721459	14202093		
AVG		78825040.8	13368140.6	92193181.4	

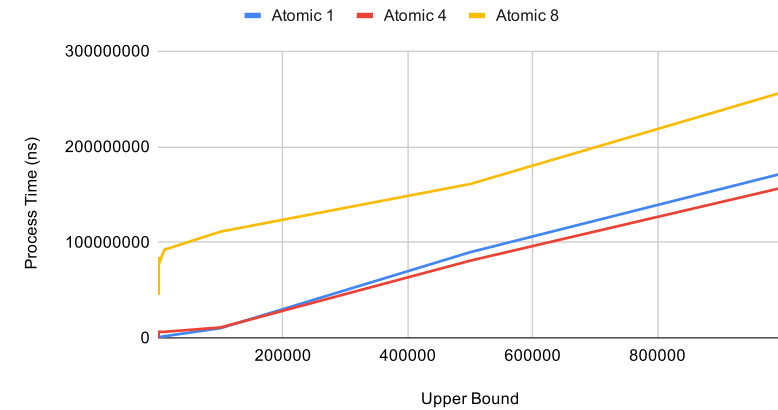
8	100000	63820478	38411630		166401
8	100000	83663845	37994702		
8	100000	90757185	28684894		
8	100000	93953872	20080507		
8	100000	86410479	11759544		
AVG		83721171.8	27386255.4	111107427.2	
8	500000	87913819	71797406		900141
8	500000	62938896	100051325		
8	500000	79585906	96045385		
8	500000	61936122	90742355		
8	500000	55504357	98278057		
AVG		69575820	91382905.6	160958725.6	
8	1000000	66995112	203553253		1853709
8	1000000	88762004	175467356		
8	1000000	86343666	186926807		
8	1000000	73404329	164506843		
8	1000000	59378173	179028157		
AVG		74976656.8	181896483.2	256873140	

Upper Bound	Atomic 1	Atomic 4	Atomic 8	Prime 1	Prime 4	Prime 8
10	3497655	4757268	70928246	495140	8173562	78217113
20	527042	4909388	76680754	509940	11912186	78619753
50	881843	218297	45103668	1387911	9788248	74553308
100	417309	4205737	72587965	673325	10556643	75575876
500	318776	5755908	84201392	821280	7079989	86718575
1000	661134	6241154	77196793	614210	8185304	89548363
10000	1646464	6236500	92193181	10048723	18038127	103523637
100000	10096240	10834251	111107427	41875275	58700947	125694108
500000	89586809	80712887	160958725	226843581	346859664	562143434
1000000	171949747	157054842	256873140	515048728	650156652	1100724723

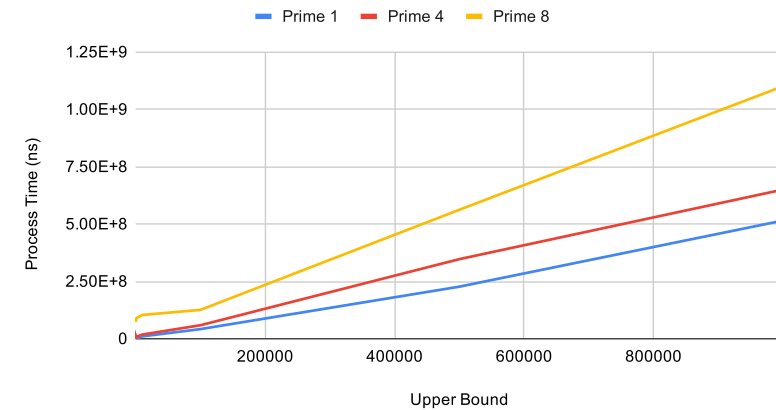
Process Time vs Upper Bound



Process Time vs Upper Bound (Atomic)



Process Time vs. Upper Bound (Prime)



Upper Bound	Atomic 1	Atomic 4	Atomic 8	Prime 1	Prime 4	Prime 8
10	2	2	2	2	2	2
20	7	7	7	7	7	7
50	28	28	28	28	28	28
100	72	72	72	72	72	72
500	170	170	170	170	170	170
1000	509	509	509	509	509	509
10000	1127	1127	1127	1127	1127	1127
100000	14301	14301	14301	14301	14301	14301
500000	166401	166401	166401	166401	166401	166401
1000000	1853709	1853709	1853709	1853709	1853709	1853709

Number of Unnecessary Crossouts vs Upper Bound

