

# [Quartz Certification Sheet]

## 1. Transmittance

- 장비명 : Spectrophotometer
- 제품명 : Varian사 제품
- 모델명 : Cary5000



Collection Time: 2011-06-20 오후 3:19:50

Operator Name :

Scan Software Version: 3.00(182)

Parameter List :

Instrument	Cary 5000
Instrument Version	1.12
Start (nm)	3000.00
Stop (nm)	200.00
X Mode	Nanometers
Y Mode	%T
UV-Vis Data Interval (nm)	2.000
UV-Vis Ave. Time (sec)	0.100
UV-Vis SBW (nm)	2.000
Slit Height	Full
Beam Mode	Double
Signal-to-noise Mode	Off

UV Source On  
 Vis Source On  
 Third Source Off  
 Source Changeover (nm) 350.00  
 Detector Changeover (nm) 800.00  
 Grating Changeover (nm) 800.00  
 Baseline Correction On  
 Baseline Type Baseline correction  
 Baseline File Name  
 Baseline Std Ref File Name  
 Cycle Mode Off

Comments

Method Log :

Method Name : Default

Date/Time stamp: 2011-06-20 오전 9:27:53

Method Modifications:

Y mode Changed: 2011-06-20 오후 3:14:22	Old:Abs	New:%T
Baseline Correction Changed: 2011-06-20 오후 3:14:22	Old:0	New:1
Sipper Type Changed: 2011-06-20 오후 3:14:22	Old:Internal RSA	New:External sipper

End Method Modifications

<SBW (nm)>	2
<Energy>	3
<Slit height>	Full
<Current Wavelength>	799
<SBW (nm)>	2
<Energy>	50.12
<Slit height>	Full
<Current Wavelength>	200

2

2

Collection Time: 2011-06-20 오후 3:24:23

Operator Name :

Scan Software Version: 3.00(182)

Parameter List :

Instrument	Cary 5000
Instrument Version	1.12
Start (nm)	3000.00
Stop (nm)	200.00
X Mode	Nanometers
Y Mode	%T
UV-Vis Data Interval (nm)	2.000
UV-Vis Ave. Time (sec)	0.100
UV-Vis SBW (nm)	2.000
Slit Height	Full
Beam Mode	Double
Signal-to-noise Mode	Off
UV Source	On
Vis Source	On
Third Source	Off
Source Changeover (nm)	350.00
Detector Changeover (nm)	800.00
Grating Changeover (nm)	800.00
Baseline Correction	On
Baseline Type	Baseline correction
Baseline File Name	
Baseline Std Ref File Name	
Cycle Mode	Off

Comments

Method Log :

Method Name : Default

Date/Time stamp: 2011-06-20 오전 9:27:53

Method Modifications:

Y mode Changed: 2011-06-20 오후 3:14:22	Old:Abs	New:%T
Baseline Correction Changed: 2011-06-20 오후 3:14:22	Old:0	New:1
Sipper Type Changed: 2011-06-20 오후 3:14:22	Old:Internal RSA	New:External sipper

End Method Modifications

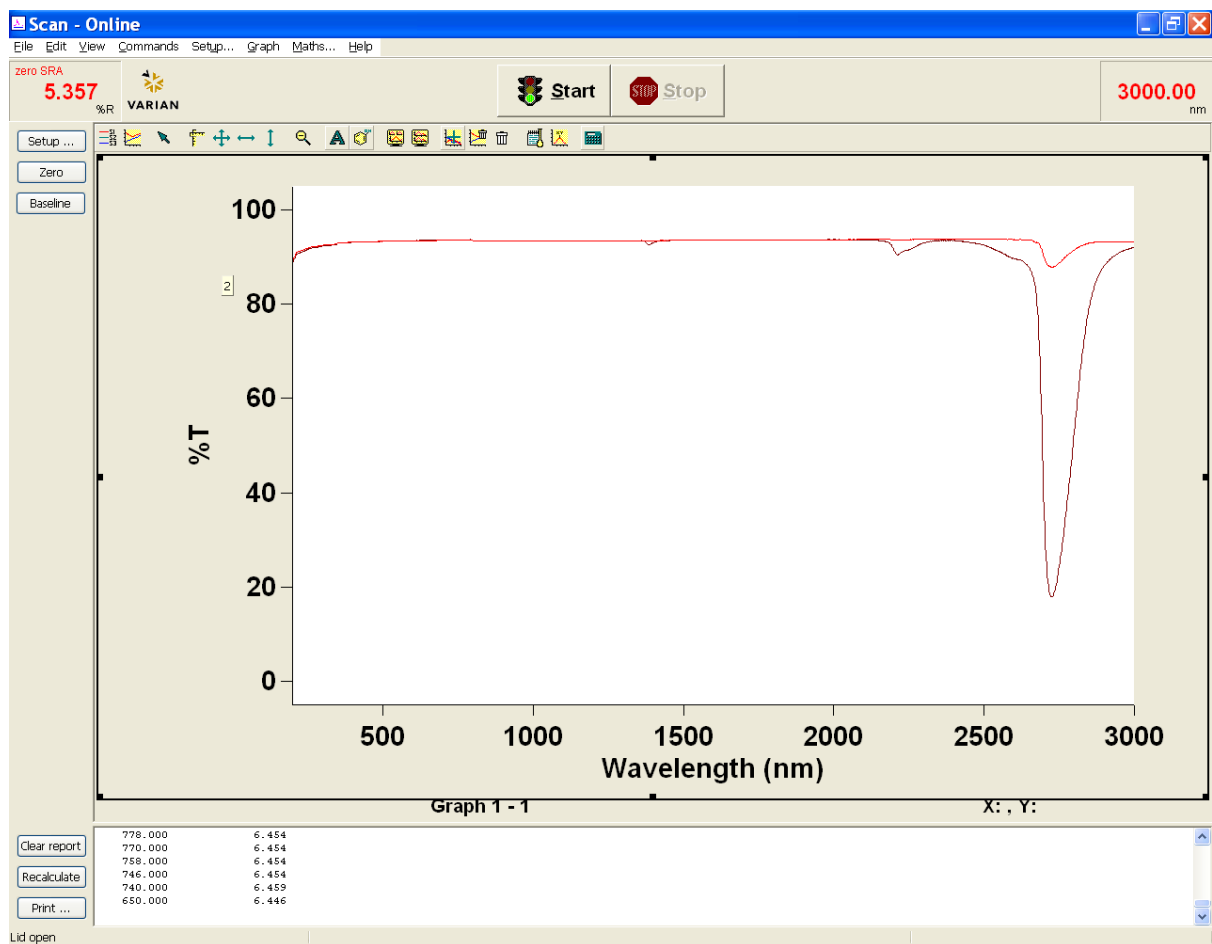
<SBW (nm)>

2

<Energy>		3
<Slit height>	Full	
<Current Wavelength>		800
<SBW (nm)>		2
<Energy>		50.12
<Slit height>	Full	
<Current Wavelength>		200

----- : Korean Sample

----- : Japna Sample



korea sample		Japan sample	
Wavelength (nm)	%T	Wavelength (nm)	%T
3000	93.23764	3000	92.04451752
2998	93.22902	2998	92.02638245
2996	93.22926	2996	91.97766876
2994	93.24012	2994	91.96522522
2992	93.2487	2992	91.92942047
2990	93.25751	2990	91.89323425
2988	93.25512	2988	91.86814117
2986	93.23973	2986	91.81743622
2984	93.23989	2984	91.78097534
2982	93.24938	2982	91.75095367
2980	93.24658	2980	91.69708252
2978	93.25171	2978	91.67420959
2976	93.27464	2976	91.64083862
2974	93.266	2974	91.58776093
2972	93.25411	2972	91.54482269
2970	93.26443	2970	91.50157928
2968	93.24905	2968	91.43791199
2966	93.26305	2966	91.40847015
2964	93.27043	2964	91.34745789
2962	93.26517	2962	91.31417084
2960	93.26965	2960	91.22525787
2958	93.27124	2958	91.17944336
2956	93.2715	2956	91.12599182
2954	93.27572	2954	91.06866455
2952	93.28064	2952	91.00552368
2950	93.27583	2950	90.92784882
2948	93.27719	2948	90.87242889

2946	93.27092	2946	90.78863525
2944	93.27705	2944	90.71479034
2942	93.28293	2942	90.6463089
2940	93.27827	2940	90.56324768
2938	93.27611	2938	90.48093414
2936	93.2853	2936	90.40713501
2934	93.28116	2934	90.31147003
2932	93.27422	2932	90.22361755
2930	93.2766	2930	90.13258362
2928	93.27936	2928	90.03625488
2926	93.27251	2926	89.92783356
2924	93.28336	2924	89.82624054
2922	93.27724	2922	89.71603394
2920	93.2749	2920	89.60128784
2918	93.27786	2918	89.48766327
2916	93.27345	2916	89.35812378
2914	93.2767	2914	89.23790741
2912	93.2776	2912	89.10128784
2910	93.27503	2910	88.96227264
2908	93.26407	2908	88.81990051
2906	93.26145	2906	88.66012573
2904	93.2592	2904	88.51242065
2902	93.25813	2902	88.34593201
2900	93.25079	2900	88.17221832
2898	93.26666	2898	87.99797058
2896	93.25557	2896	87.83963776
2894	93.24413	2894	87.63181305
2892	93.24249	2892	87.43184662
2890	93.23694	2890	87.22366333
2888	93.22813	2888	86.97364044
2886	93.22144	2886	86.74015808
2884	93.21352	2884	86.50061798
2882	93.20811	2882	86.23987579
2880	93.19978	2880	85.96042633

2878	93.19307	2878	85.67832947
2876	93.18392	2876	85.37176514
2874	93.1726	2874	85.04021454
2872	93.1559	2872	84.70422363
2870	93.14808	2870	84.35223389
2868	93.13792	2868	83.96216583
2866	93.12364	2866	83.56510162
2864	93.1114	2864	83.14962769
2862	93.08786	2862	82.67021942
2860	93.06699	2860	82.20233917
2858	93.04783	2858	81.70897675
2856	93.02353	2856	81.15660095
2854	93.00075	2854	80.59825897
2852	92.9827	2852	80.02297974
2850	92.95338	2850	79.38159943
2848	92.92751	2848	78.72729492
2846	92.89812	2846	78.04256439
2844	92.86848	2844	77.30690002
2842	92.841	2842	76.54203033
2840	92.80084	2840	75.73496246
2838	92.76985	2838	74.90862274
2836	92.7168	2836	74.00772095
2834	92.6786	2834	73.09275055
2832	92.62662	2832	72.14778137
2830	92.57297	2830	71.02731323
2828	92.51736	2828	70.00737
2826	92.46306	2826	68.95243073
2824	92.39795	2824	67.81232452
2822	92.35104	2822	66.70617676
2820	92.3017	2820	65.58380127
2818	92.23083	2818	64.33106995
2816	92.1633	2816	63.1218071
2814	92.09035	2814	61.88103485
2812	92.03076	2812	60.58340836

2810	91.95373	2810	59.31208038
2808	91.86321	2808	58.01290131
2806	91.76991	2806	56.68721771
2804	91.67744	2804	55.37892151
2802	91.57018	2802	54.07717133
2800	91.49786	2800	52.79798508
2798	91.41266	2798	51.49200058
2796	91.3325	2796	50.1823082
2794	91.25057	2794	48.90019989
2792	91.14183	2792	47.56479645
2790	91.02651	2790	46.27124023
2788	90.90545	2788	44.99399185
2786	90.8253	2786	43.6973114
2784	90.73442	2784	42.47547531
2782	90.65202	2782	41.2821312
2780	90.54776	2780	40.03322983
2778	90.46854	2778	38.871315
2776	90.34617	2776	37.70627213
2774	90.22826	2774	36.51449585
2772	90.10437	2772	35.40534973
2770	90.00305	2770	34.31981277
2768	89.88129	2768	33.22168732
2766	89.80216	2766	32.14680481
2764	89.69101	2764	31.07399368
2762	89.51953	2762	30.00840187
2760	89.41276	2760	28.97912788
2758	89.27361	2758	27.97549438
2756	89.07726	2756	27.01724243
2754	88.89647	2754	26.05994034
2752	88.82426	2752	25.17192459
2750	88.74927	2750	24.34719658
2748	88.68848	2748	23.50084686
2746	88.58062	2746	22.71617699
2744	88.44308	2744	21.95703888



2742	88.33749	2742	21.22525787
2740	88.22301	2740	20.59034348
2738	88.0906	2738	19.99930954
2736	88.00962	2736	19.43100166
2734	87.97794	2734	18.96930504
2732	87.94921	2732	18.56894493
2730	87.92412	2730	18.24168587
2728	87.89562	2728	18.02051353
2726	87.87209	2726	17.88897896
2724	87.8855	2724	17.86540794
2722	87.90303	2722	17.96888733
2720	87.93835	2720	18.2208519
2718	88.00508	2718	18.64740181
2716	88.10067	2716	19.26945686
2714	88.17135	2714	20.12980652
2712	88.31786	2712	21.24550247
2710	88.48341	2710	22.71551895
2708	88.69098	2708	24.41659355
2706	88.93433	2706	26.50013351
2704	89.22916	2704	29.24499512
2702	89.58614	2702	32.36050797
2700	89.98377	2700	35.92344284
2698	90.39323	2698	40.13995743
2696	90.79146	2696	44.5365715
2694	91.1907	2694	49.25623703
2692	91.52569	2692	54.21699142
2690	91.86419	2690	58.80029297
2688	92.19052	2688	63.22973251
2686	92.51041	2686	67.35365295
2684	92.74728	2684	70.96141815
2682	92.98405	2682	74.05115509
2680	93.11301	2680	76.65734863
2678	93.09762	2678	78.7751236
2676	93.10512	2676	80.42996216

2674	93.12701	2674	81.74819946
2672	93.06721	2672	82.83157349
2670	93.0535	2670	83.64864349
2668	93.2008	2668	84.42403412
2666	93.31758	2666	85.13534546
2664	93.3895	2664	85.66016388
2662	93.4722	2662	86.10906982
2660	93.531	2660	86.48168182
2658	93.59542	2658	86.79216766
2656	93.61587	2656	87.06277466
2654	93.63304	2654	87.31381226
2652	93.665	2652	87.55003357
2650	93.63259	2650	87.75113678
2648	93.64794	2648	87.96350098
2646	93.64227	2646	88.12243652
2644	93.64721	2644	88.26782227
2642	93.63446	2642	88.40501404
2640	93.64815	2640	88.51649475
2638	93.63242	2638	88.61872101
2636	93.65429	2636	88.71800232
2634	93.67786	2634	88.86550903
2632	93.69551	2632	88.96782684
2630	93.67628	2630	89.08487701
2628	93.71844	2628	89.18183899
2626	93.67718	2626	89.27303314
2624	93.70518	2624	89.30340576
2622	93.74625	2622	89.40981293
2620	93.75529	2620	89.41165161
2618	93.73275	2618	89.47150421
2616	93.68481	2616	89.43001556
2614	93.60237	2614	89.43003082
2612	93.57233	2612	89.42136383
2610	93.60275	2610	89.49236298
2608	93.67601	2608	89.56591797

2606	93.69604	2606	89.60098267
2604	93.68468	2604	89.56969452
2602	93.7009	2602	89.58591461
2600	93.72295	2600	89.62129974
2598	93.71107	2598	89.66950989
2596	93.71684	2596	89.74163818
2594	93.74794	2594	89.72721863
2592	93.73569	2592	89.8061142
2590	93.73605	2590	89.82780457
2588	93.77234	2588	89.99357605
2586	93.76928	2586	90.01419067
2584	93.73644	2584	90.10643005
2582	93.72598	2582	90.08427429
2580	93.74266	2580	90.19385529
2578	93.70362	2578	90.2289505
2576	93.74886	2576	90.3243103
2574	93.73661	2574	90.36168671
2572	93.76701	2572	90.43668365
2570	93.77338	2570	90.52742004
2568	93.77865	2568	90.5273056
2566	93.75332	2566	90.60074615
2564	93.77157	2564	90.65174103
2562	93.74933	2562	90.78329468
2560	93.75246	2560	90.82128143
2558	93.77519	2558	90.96746826
2556	93.76122	2556	91.01002502
2554	93.77391	2554	91.07878113
2552	93.75365	2552	91.13511658
2550	93.79089	2550	91.18560791
2548	93.76453	2548	91.2453537
2546	93.77351	2546	91.26732635
2544	93.77021	2544	91.36753082
2542	93.76669	2542	91.3835907
2540	93.76939	2540	91.47257996

2538	93.75909	2538	91.4961319
2536	93.78636	2536	91.58274841
2534	93.77877	2534	91.64899445
2532	93.79567	2532	91.72078705
2530	93.78301	2530	91.8037262
2528	93.79465	2528	91.84130096
2526	93.79174	2526	91.92089844
2524	93.78395	2524	91.94361115
2522	93.79657	2522	92.02337646
2520	93.78755	2520	92.06427765
2518	93.79973	2518	92.12161255
2516	93.78941	2516	92.16767883
2514	93.79935	2514	92.21800232
2512	93.7933	2512	92.27388763
2510	93.79778	2510	92.30527496
2508	93.80105	2508	92.36795044
2506	93.80075	2506	92.40585327
2504	93.80249	2504	92.44493866
2502	93.80299	2502	92.49176025
2500	93.80991	2500	92.52372742
2498	93.8055	2498	92.56355286
2496	93.80721	2496	92.59633636
2494	93.8065	2494	92.63011932
2492	93.805	2492	92.6667099
2490	93.80804	2490	92.69404602
2488	93.80749	2488	92.72341156
2486	93.81072	2486	92.75341797
2484	93.81271	2484	92.78128052
2482	93.81317	2482	92.81212616
2480	93.8104	2480	92.83609009
2478	93.8112	2478	92.85794067
2476	93.81023	2476	92.88282776
2474	93.80929	2474	92.90128326
2472	93.80957	2472	92.92043304

2470	93.81086	2470	92.95024109
2468	93.80996	2468	92.96265411
2466	93.80908	2466	92.97624969
2464	93.80917	2464	93.0005188
2462	93.80693	2462	93.01411438
2460	93.81535	2460	93.04360199
2458	93.81559	2458	93.05281067
2456	93.81492	2456	93.07391357
2454	93.81216	2454	93.08662415
2452	93.81601	2452	93.10305786
2450	93.82081	2450	93.1337738
2448	93.8098	2448	93.13262177
2446	93.81346	2446	93.16251373
2444	93.80971	2444	93.17592621
2442	93.80598	2442	93.17762756
2440	93.82114	2440	93.22853851
2438	93.80647	2438	93.20690155
2436	93.81658	2436	93.2509613
2434	93.81363	2434	93.26335144
2432	93.80679	2432	93.25494385
2430	93.82533	2430	93.3253479
2428	93.80606	2428	93.29283905
2426	93.82178	2426	93.33965302
2424	93.81902	2424	93.36708832
2422	93.80588	2422	93.33244324
2420	93.83176	2420	93.42025757
2418	93.80214	2418	93.37120819
2416	93.81885	2416	93.41231537
2414	93.82773	2414	93.46492004
2412	93.79751	2412	93.39263916
2410	93.83743	2410	93.50157928
2408	93.80636	2408	93.45580292
2406	93.80727	2406	93.45095825
2404	93.8398	2404	93.54764557

2402	93.7925	2402	93.44832611
2400	93.82418	2400	93.53448486
2398	93.82822	2398	93.55311584
2396	93.7849	2396	93.47037506
2394	93.83778	2394	93.60181427
2392	93.80768	2392	93.52243042
2390	93.79968	2390	93.52626038
2388	93.84709	2388	93.62971497
2386	93.78876	2386	93.49737549
2384	93.81854	2384	93.58422089
2382	93.83438	2382	93.60786438
2380	93.77676	2380	93.49080658
2378	93.83691	2378	93.63100433
2376	93.81855	2376	93.56235504
2374	93.7796	2374	93.51062012
2372	93.84338	2372	93.6375351
2370	93.79327	2370	93.50708771
2368	93.78851	2368	93.54406738
2366	93.83942	2366	93.62069702
2364	93.77652	2364	93.47520447
2362	93.80172	2362	93.57221222
2360	93.83187	2360	93.57893372
2358	93.76697	2358	93.46568298
2356	93.81153	2356	93.58604431
2354	93.81969	2354	93.53398895
2352	93.7599	2352	93.46031189
2350	93.82448	2350	93.59623718
2348	93.81214	2348	93.48809052
2346	93.76894	2346	93.46753693
2344	93.82546	2344	93.56985474
2342	93.79015	2342	93.433815
2340	93.7658	2340	93.45396423
2338	93.82088	2338	93.53583527
2336	93.78182	2336	93.38697052

2334	93.76163	2334	93.43450165
2332	93.82405	2332	93.49330902
2330	93.77456	2330	93.34246826
2328	93.76082	2328	93.40166473
2326	93.81641	2326	93.43270874
2324	93.76758	2324	93.29135895
2322	93.75729	2322	93.35159302
2320	93.80904	2320	93.36444855
2318	93.77171	2318	93.24662781
2316	93.75786	2316	93.28391266
2314	93.79064	2314	93.28125763
2312	93.76739	2312	93.18695831
2310	93.75996	2310	93.19740295
2308	93.77901	2308	93.17609406
2306	93.76495	2306	93.11077881
2304	93.76189	2304	93.09603882
2302	93.76312	2302	93.05861664
2300	93.75737	2300	93.00989532
2298	93.75814	2298	92.97569275
2296	93.75514	2296	92.93024445
2294	93.75236	2294	92.88893127
2292	93.74696	2292	92.84001923
2290	93.74474	2290	92.79854584
2288	93.75926	2288	92.73734283
2286	93.73304	2286	92.67179108
2284	93.74564	2284	92.64953613
2282	93.75381	2282	92.55998993
2280	93.73476	2280	92.48641205
2278	93.73433	2278	92.45677948
2276	93.7441	2276	92.3793335
2274	93.7341	2274	92.28195953
2272	93.72769	2272	92.24189758
2270	93.73933	2270	92.17178345
2268	93.72699	2268	92.06929779

2266	93.71678	2266	92.01198578
2264	93.7304	2264	91.96479034
2262	93.73253	2262	91.86016083
2260	93.70435	2260	91.78687286
2258	93.70869	2258	91.76026917
2256	93.7234	2256	91.67349243
2254	93.69861	2254	91.59366608
2252	93.68995	2252	91.5896225
2250	93.70294	2250	91.53753662
2248	93.69787	2248	91.46234894
2246	93.67622	2246	91.45463562
2244	93.68266	2244	91.44496155
2242	93.69674	2242	91.39653778
2240	93.68478	2240	91.37564087
2238	93.67988	2238	91.37028503
2236	93.68454	2236	91.33525848
2234	93.6788	2234	91.27983856
2232	93.66821	2232	91.25331116
2230	93.67133	2230	91.20256042
2228	93.6726	2228	91.1151123
2226	93.66644	2226	91.03380585
2224	93.65832	2224	90.94985199
2222	93.65683	2222	90.84960938
2220	93.65575	2220	90.73669434
2218	93.64713	2218	90.64686584
2216	93.64259	2216	90.57466125
2214	93.64374	2214	90.51345825
2212	93.63611	2212	90.492836
2210	93.63424	2210	90.53715515
2208	93.64167	2208	90.63881683
2206	93.64695	2206	90.79312897
2204	93.65755	2204	91.0109787
2202	93.66396	2202	91.2698822
2200	93.67606	2200	91.54639435



2198	93.68841	2198	91.83863068
2196	93.694	2196	92.09618378
2194	93.70531	2194	92.32132721
2192	93.71173	2192	92.53225708
2190	93.71573	2190	92.69060516
2188	93.72328	2188	92.82487488
2186	93.72424	2186	92.93418884
2184	93.72412	2184	93.01047516
2182	93.73737	2182	93.08044434
2180	93.73391	2180	93.14040375
2178	93.72994	2178	93.19989777
2176	93.73082	2176	93.23080444
2174	93.73535	2174	93.24707031
2172	93.74204	2172	93.28759766
2170	93.73763	2170	93.34012604
2168	93.74406	2168	93.35715485
2166	93.75964	2166	93.35407257
2164	93.75	2164	93.37271118
2162	93.73781	2162	93.41770172
2160	93.73855	2160	93.44039917
2158	93.75063	2158	93.4353714
2156	93.74477	2156	93.44351959
2154	93.7486	2154	93.48485565
2152	93.74226	2152	93.51952362
2150	93.7536	2150	93.51347351
2148	93.75681	2148	93.52289581
2146	93.74432	2146	93.54514313
2144	93.73463	2144	93.58314514
2142	93.74045	2142	93.59056854
2140	93.75024	2140	93.58013916
2138	93.75999	2138	93.59647369
2136	93.7383	2136	93.62260437
2134	93.73747	2134	93.63871765
2132	93.74147	2132	93.62986755

2130	93.75135	2130	93.62258911
2128	93.74837	2128	93.63200378
2126	93.7354	2126	93.65531158
2124	93.73679	2124	93.67076874
2122	93.74412	2122	93.65460968
2120	93.74245	2120	93.63891602
2118	93.73535	2118	93.65446472
2116	93.73853	2116	93.67896271
2114	93.73439	2114	93.6800766
2112	93.74462	2112	93.66821289
2110	93.74705	2110	93.65493774
2108	93.73622	2108	93.66363525
2106	93.72584	2106	93.68556976
2104	93.73184	2104	93.68984985
2102	93.73772	2102	93.67297363
2100	93.74055	2100	93.66265106
2098	93.73692	2098	93.67247772
2096	93.73347	2096	93.69715881
2094	93.72911	2094	93.6969223
2092	93.72462	2092	93.67138672
2090	93.73601	2090	93.66234589
2088	93.73525	2088	93.66454315
2086	93.72643	2086	93.68219757
2084	93.72611	2084	93.69173431
2082	93.71615	2082	93.6812439
2080	93.73227	2080	93.66545105
2078	93.72755	2078	93.65374756
2076	93.73401	2076	93.66655731
2074	93.71868	2074	93.67955017
2072	93.71877	2072	93.68193054
2070	93.7195	2070	93.67183685
2068	93.72563	2068	93.65317535
2066	93.72391	2066	93.65033722
2064	93.73287	2064	93.66240692

2062	93.71526	2062	93.66883087
2060	93.71293	2060	93.67290497
2058	93.71216	2058	93.6668396
2056	93.71827	2056	93.65688324
2054	93.72514	2054	93.65421295
2052	93.73054	2052	93.66107941
2050	93.72102	2050	93.6762085
2048	93.71704	2048	93.68790436
2046	93.71034	2046	93.68248749
2044	93.70977	2044	93.67683411
2042	93.71531	2042	93.66789246
2040	93.71851	2040	93.67261505
2038	93.71951	2038	93.67518616
2036	93.71536	2036	93.69270325
2034	93.71512	2034	93.70209503
2032	93.7065	2032	93.69802856
2030	93.69998	2030	93.68979645
2028	93.70258	2028	93.69248199
2026	93.71337	2026	93.68897247
2024	93.70683	2024	93.68939209
2022	93.71902	2022	93.70761871
2020	93.71078	2020	93.71440125
2018	93.7041	2018	93.72211456
2016	93.70292	2016	93.71566772
2014	93.69926	2014	93.71489716
2012	93.70013	2012	93.69866943
2010	93.70662	2010	93.70603943
2008	93.70914	2008	93.70272064
2006	93.71028	2006	93.71363068
2004	93.70967	2004	93.72254181
2002	93.70419	2002	93.72872162
2000	93.69862	2000	93.72631836
1998	93.68325	1998	93.7118454
1996	93.68173	1996	93.70443726

1994	93.6805	1994	93.6897049
1992	93.69032	1992	93.69137573
1990	93.68754	1990	93.69437408
1988	93.69794	1988	93.7103653
1986	93.70351	1986	93.72284698
1984	93.69817	1984	93.72290039
1982	93.69107	1982	93.72349548
1980	93.68462	1980	93.72156525
1978	93.68198	1978	93.71577454
1976	93.67669	1976	93.69963074
1974	93.67393	1974	93.69046783
1972	93.67459	1972	93.68231201
1970	93.67688	1970	93.68172455
1968	93.68085	1968	93.68982697
1966	93.6796	1966	93.68884277
1964	93.68729	1964	93.69761658
1962	93.68557	1962	93.70246124
1960	93.68716	1960	93.71552277
1958	93.68473	1958	93.70935822
1956	93.68293	1956	93.71068573
1954	93.67947	1954	93.71388245
1952	93.67873	1952	93.70472717
1950	93.67216	1950	93.6966629
1948	93.66749	1948	93.68731689
1946	93.66322	1946	93.67176056
1944	93.66572	1944	93.6752243
1942	93.67376	1942	93.67668152
1940	93.66913	1940	93.66921997
1938	93.66775	1938	93.67541504
1936	93.67312	1936	93.67982483
1934	93.67062	1934	93.67634583
1932	93.67408	1932	93.68881989
1930	93.68005	1930	93.69519043
1928	93.67769	1928	93.69721985

1926	93.67316	1926	93.6987915
1924	93.67174	1924	93.69616699
1922	93.67263	1922	93.70849609
1920	93.68797	1920	93.71308136
1918	93.67889	1918	93.70121765
1916	93.67201	1916	93.69745636
1914	93.66908	1914	93.70195007
1912	93.67303	1912	93.69623566
1910	93.66004	1910	93.67902374
1908	93.66306	1908	93.68075562
1906	93.65952	1906	93.6663208
1904	93.65678	1904	93.6605072
1902	93.65836	1902	93.67453766
1900	93.66273	1900	93.68001556
1898	93.66068	1898	93.67459106
1896	93.65675	1896	93.6663208
1894	93.65054	1894	93.66408539
1892	93.65684	1892	93.66503143
1890	93.65456	1890	93.66757202
1888	93.65556	1888	93.66426086
1886	93.65756	1886	93.66452789
1884	93.6578	1884	93.65930176
1882	93.65292	1882	93.66190338
1880	93.65411	1880	93.65641785
1878	93.64865	1878	93.65570068
1876	93.64906	1876	93.66188049
1874	93.6414	1874	93.64769745
1872	93.64552	1872	93.63864136
1870	93.65764	1870	93.66637421
1868	93.66299	1868	93.67607117
1866	93.66509	1866	93.68069458
1864	93.65516	1864	93.680336
1862	93.65601	1862	93.68554688
1860	93.65742	1860	93.69350433

1858	93.66932	1858	93.70355988
1856	93.67018	1856	93.6910553
1854	93.65541	1854	93.69169617
1852	93.63719	1852	93.67205811
1850	93.64806	1850	93.66046906
1848	93.66949	1848	93.66402435
1846	93.65514	1846	93.66345978
1844	93.64494	1844	93.66471863
1842	93.63811	1842	93.64546204
1840	93.63316	1840	93.62465668
1838	93.62405	1838	93.61655426
1836	93.6162	1836	93.63269806
1834	93.62483	1834	93.65027618
1832	93.6358	1832	93.64151764
1830	93.63405	1830	93.63567352
1828	93.64157	1828	93.64187622
1826	93.64478	1826	93.65190125
1824	93.64489	1824	93.65975189
1822	93.64898	1822	93.67127228
1820	93.64413	1820	93.67316437
1818	93.62634	1818	93.6668396
1816	93.63034	1816	93.6775589
1814	93.62429	1814	93.67235565
1812	93.6246	1812	93.66353607
1810	93.62714	1810	93.65921783
1808	93.62685	1808	93.64655304
1806	93.63013	1806	93.64042664
1804	93.63151	1804	93.63994598
1802	93.63097	1802	93.64305115
1800	93.63177	1800	93.65129089
1798	93.62117	1798	93.65703583
1796	93.61818	1796	93.66136932
1794	93.62151	1794	93.65621185
1792	93.62089	1792	93.65747833

1790	93.61825	1790	93.65361786
1788	93.62384	1788	93.64009857
1786	93.62525	1786	93.63598633
1784	93.6204	1784	93.64237976
1782	93.621	1782	93.65167236
1780	93.62144	1780	93.6539917
1778	93.61731	1778	93.65959167
1776	93.61239	1776	93.65052795
1774	93.61564	1774	93.63670349
1772	93.61974	1772	93.63253021
1770	93.61656	1770	93.63266754
1768	93.624	1768	93.64220428
1766	93.61695	1766	93.64572906
1764	93.60606	1764	93.64601898
1762	93.61029	1762	93.64849854
1760	93.61317	1760	93.64118958
1758	93.61653	1758	93.63876343
1756	93.61895	1756	93.63368988
1754	93.61358	1754	93.63565063
1752	93.6076	1752	93.63825989
1750	93.60574	1750	93.64631653
1748	93.6038	1748	93.6448822
1746	93.61271	1746	93.6346283
1744	93.61409	1744	93.62745667
1742	93.60976	1742	93.62632751
1740	93.60459	1740	93.63470459
1738	93.60162	1738	93.6415863
1736	93.60297	1736	93.63715363
1734	93.60754	1734	93.6277771
1732	93.61291	1732	93.62522125
1730	93.60421	1730	93.6286087
1728	93.59946	1728	93.63067627
1726	93.60174	1726	93.64112854
1724	93.60329	1724	93.63023376

1722	93.60726	1722	93.62026215
1720	93.60582	1720	93.62733459
1718	93.59721	1718	93.63293457
1716	93.60004	1716	93.62866974
1714	93.60283	1714	93.62477112
1712	93.59911	1712	93.62192535
1710	93.59924	1710	93.62287903
1708	93.59482	1708	93.62508392
1706	93.60122	1706	93.62453461
1704	93.59966	1704	93.61716461
1702	93.60213	1702	93.62080383
1700	93.59058	1700	93.62083435
1698	93.59906	1698	93.62686157
1696	93.59944	1696	93.61750793
1694	93.59718	1694	93.61651611
1692	93.59069	1692	93.62336731
1690	93.58969	1690	93.61722565
1688	93.59317	1688	93.61266327
1686	93.58897	1686	93.60853577
1684	93.59018	1684	93.61508179
1682	93.58978	1682	93.61577606
1680	93.59445	1680	93.61759949
1678	93.5904	1678	93.61290741
1676	93.58633	1676	93.61126709
1674	93.5974	1674	93.61684418
1672	93.59352	1672	93.61145782
1670	93.58421	1670	93.60720825
1668	93.58852	1668	93.61654663
1666	93.58815	1666	93.60894775
1664	93.58916	1664	93.61219788
1662	93.5879	1662	93.61255646
1660	93.58677	1660	93.6105423
1658	93.57986	1658	93.60124969
1656	93.58502	1656	93.60374451



1654	93.57747	1654	93.60790253
1652	93.58699	1652	93.61199188
1650	93.58148	1650	93.6052475
1648	93.57862	1648	93.60658264
1646	93.5902	1646	93.61193848
1644	93.58346	1644	93.60630035
1642	93.58144	1642	93.60354614
1640	93.58044	1640	93.60683441
1638	93.5835	1638	93.61050415
1636	93.57463	1636	93.60243225
1634	93.57538	1634	93.60485077
1632	93.57021	1632	93.59113312
1630	93.58095	1630	93.60558319
1628	93.57455	1628	93.59448242
1626	93.57664	1626	93.598526
1624	93.57336	1624	93.5953064
1622	93.58199	1622	93.60079956
1620	93.57867	1620	93.5983963
1618	93.57145	1618	93.592659
1616	93.57203	1616	93.59559631
1614	93.57097	1614	93.59442902
1612	93.57452	1612	93.59403229
1610	93.57153	1610	93.59418488
1608	93.57352	1608	93.59505463
1606	93.57035	1606	93.59268951
1604	93.56961	1604	93.59346008
1602	93.56901	1602	93.58930969
1600	93.56651	1600	93.59113312
1598	93.56927	1598	93.59164429
1596	93.56621	1596	93.58779144
1594	93.57034	1594	93.58822632
1592	93.56589	1592	93.58643341
1590	93.56377	1590	93.58472443
1588	93.57442	1588	93.59050751

1586	93.56546	1586	93.58835602
1584	93.5704	1584	93.58817291
1582	93.57001	1582	93.58784485
1580	93.56796	1580	93.58370209
1578	93.56328	1578	93.58486176
1576	93.55975	1576	93.58463287
1574	93.56312	1574	93.58615875
1572	93.56171	1572	93.58500671
1570	93.55979	1570	93.58159637
1568	93.55571	1568	93.57611847
1566	93.55523	1566	93.57339478
1564	93.55779	1564	93.57933044
1562	93.5593	1562	93.57513428
1560	93.55431	1560	93.57639313
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1548	93.55508	1548	93.5753479
1546	93.55367	1546	93.57246399
1544	93.55623	1544	93.57355499
1542	93.55614	1542	93.56984711
1540	93.55319	1540	93.57263184
1538	93.55769	1538	93.57341003
1536	93.55486	1536	93.57230377
1534	93.55328	1534	93.5725174
1532	93.555	1532	93.56826782
1530	93.55154	1530	93.57069397
1528	93.55527	1528	93.56700897
1526	93.54803	1526	93.56824493
1524	93.5492	1524	93.56635284
1522	93.54497	1522	93.56854248
1520	93.54429	1520	93.56347656

1518	93.54659	1518	93.56565094
1516	93.5512	1516	93.56739807
1514	93.54868	1514	93.56739807
1512	93.54549	1512	93.55841827
1510	93.54475	1510	93.56075287
1508	93.54871	1508	93.56008148
1506	93.54823	1506	93.56480408
1504	93.54536	1504	93.55921936
1502	93.53933	1502	93.55423737
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1498	93.54339	1498	93.55490112
1496	93.53854	1496	93.54720306
1494	93.54035	1494	93.5510788
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1490	93.53582	1490	93.55099487
1488	93.53798	1488	93.54670715
1486	93.54072	1486	93.55393219
1484	93.5357	1484	93.54593658
1482	93.54066	1482	93.54745483
1480	93.53433	1480	93.5418396
1478	93.53496	1478	93.54278564
1476	93.53463	1476	93.54031372
1474	93.53	1474	93.5406723
1472	93.52914	1472	93.525383
1470	93.5329	1470	93.53511047
1468	93.5258	1468	93.526474
1466	93.53056	1466	93.52548981
1464	93.53418	1464	93.53028107
1462	93.53101	1462	93.52484894
1460	93.53165	1460	93.52184296
1458	93.52925	1458	93.52584839
1456	93.53307	1456	93.51988983
1454	93.52648	1454	93.5147934
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1448	93.52018	1448	93.49434662
1446	93.52751	1446	93.49388885
1444	93.52777	1444	93.49616241
1442	93.52077	1442	93.48748016
1440	93.51944	1440	93.48167419
1438	93.52554	1438	93.47576141
1436	93.51868	1436	93.46414185
1434	93.52394	1434	93.46214294
1432	93.51862	1432	93.4524765
1430	93.52181	1430	93.44693756
1428	93.51644	1428	93.42459869
1426	93.5219	1426	93.42829895
1424	93.52293	1424	93.41401672
1422	93.51517	1422	93.39717865
1420	93.51914	1420	93.38381958
1418	93.51389	1418	93.36836243
1416	93.51894	1416	93.34934235
1414	93.5173	1414	93.33143616
1412	93.51408	1412	93.30635071
1410	93.51751	1410	93.28044128
1408	93.5203	1408	93.2449646
1406	93.51713	1406	93.21097565
1404	93.50964	1404	93.16910553
1402	93.5089	1402	93.10901642
1400	93.51102	1400	93.0594101
1398	93.50117	1398	92.99516296
1396	93.51408	1396	92.92866516
1394	93.50249	1394	92.84977722
1392	93.48862	1392	92.77415466
1390	93.49039	1390	92.70256805
1388	93.48607	1388	92.64110565
1386	93.47879	1386	92.59983063
1384	93.49807	1384	92.58896637

1382	93.49733	1382	92.62906647
1380	93.49322	1380	92.73640442
1378	93.48857	1378	92.8754425
1376	93.49349	1376	93.0375061
1374	93.49833	1374	93.18344879
1372	93.50304	1372	93.27825928
1370	93.50706	1370	93.33317566
1368	93.51199	1368	93.36668396
1366	93.50568	1366	93.38265991
1364	93.5081	1364	93.40039825
1362	93.52547	1362	93.4174118
1360	93.52154	1360	93.43566895
1358	93.50769	1358	93.43017578
1356	93.50397	1356	93.43489838
1354	93.49967	1354	93.43341827
1352	93.50356	1352	93.43898773
1350	93.50089	1350	93.43962097
1348	93.50174	1348	93.44434357
1346	93.49557	1346	93.44603729
1344	93.49439	1344	93.4489975
1342	93.49821	1342	93.4564209
1340	93.49609	1340	93.45658875
1338	93.48958	1338	93.46050262
1336	93.49062	1336	93.46284485
1334	93.48944	1334	93.46851349
1332	93.49369	1332	93.47051239
1330	93.49403	1330	93.47274017
1328	93.49356	1328	93.47782898
1326	93.49691	1326	93.48415375
1324	93.49039	1324	93.47819519
1322	93.48891	1322	93.47560883
1320	93.48697	1320	93.4776535
1318	93.48361	1318	93.47396851
1316	93.49191	1316	93.48007965

1314	93.49197	1314	93.48265076
1312	93.48974	1312	93.4849472
1310	93.49356	1310	93.48347473
1308	93.48445	1308	93.48427582
1306	93.48485	1306	93.48399353
1304	93.48901	1304	93.48744965
1302	93.48257	1302	93.48455811
1300	93.48484	1300	93.48707581
1298	93.48373	1298	93.48023224
1296	93.48404	1296	93.47136688
1294	93.48296	1294	93.47236633
1292	93.48917	1292	93.47619629
1290	93.48535	1290	93.48181915
1288	93.47794	1288	93.47857666
1286	93.48002	1286	93.47904205
1284	93.47626	1284	93.46858215
1282	93.48103	1282	93.46775055
1280	93.48511	1280	93.47142792
1278	93.48004	1278	93.47245026
1276	93.47255	1276	93.47605896
1274	93.48053	1274	93.47595978
1272	93.47631	1272	93.45326996
1270	93.48365	1270	93.46344757
1268	93.47364	1268	93.46665955
1266	93.47025	1266	93.46769714
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1262	93.47976	1262	93.44794464
1260	93.47074	1260	93.44560242
1258	93.47131	1258	93.45407104
1256	93.477	1256	93.44447327
1254	93.47718	1254	93.42816925
1252	93.46243	1252	93.42965698
1250	93.46664	1250	93.44220734
1248	93.47197	1248	93.42941284

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1218	93.47442	1218	93.47314453
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1214	93.45826	1214	93.47014618
1212	93.47026	1212	93.45859528
1210	93.45929	1210	93.46796417
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1200	93.47034	1200	93.4764328
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1162	93.45512	1162	93.44576263
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1158	93.45528	1158	93.4542923
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1102	93.42915	1102	93.43414307
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1094	93.44026	1094	93.43677521
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1062	93.42351	1062	93.42541504
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1004	93.41962	1004	93.417099
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994	93.41064	994	93.41374207
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930	93.39358	930	93.38531494
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924	93.39526	924	93.39142609
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920	93.39673	920	93.39213562
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916	93.39245	916	93.38803101
914	93.38657	914	93.38489532
912	93.39311	912	93.38761139
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894	93.3889	894	93.38064575
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886	93.38064	886	93.37602997
884	93.38041	884	93.37496185
882	93.38359	882	93.37377167
880	93.38653	880	93.3731308
878	93.38013	878	93.36737061
876	93.38425	876	93.37247467
874	93.38	874	93.37870789
872	93.38544	872	93.37691498
870	93.38159	870	93.37069702
868	93.37993	868	93.37129974
866	93.37778	866	93.36300659
864	93.37711	864	93.36917877
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860	93.38437	860	93.37287903
858	93.37975	858	93.37034607
856	93.37698	856	93.36591339
854	93.37465	854	93.36647034
852	93.37985	852	93.37132263
850	93.381	850	93.36639404
848	93.37923	848	93.36568451
846	93.38097	846	93.36422729
844	93.37428	844	93.36080933
842	93.37556	842	93.36299133
840	93.37637	840	93.36261749

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834	93.37791	834	93.36273956
832	93.38035	832	93.36237335
830	93.37599	830	93.36006927
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826	93.3746	826	93.36106873
824	93.377	824	93.35984802
822	93.37566	822	93.35781097
820	93.37402	820	93.35988617
818	93.37375	818	93.35868073
816	93.37772	816	93.36587524
814	93.3843	814	93.36470032
812	93.37129	812	93.35680389
810	93.36587	810	93.34818268
808	93.37144	808	93.35225677
806	93.36848	806	93.34682465
804	93.36539	804	93.34447479
802	93.37167	802	93.34907532
800	93.36802	800	93.34278107
798	93.61168	798	93.67549896
796	93.63171	796	93.6561203
794	93.65182	794	93.66151428
792	93.67677	792	93.7483902
790	93.64954	790	93.69302368
788	93.62119	788	93.71188354
786	93.59942	786	93.68781281
784	93.60473	784	93.66405487
782	93.61409	782	93.69039917
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778	93.60565	778	93.63838959
776	93.61617	776	93.64658356
774	93.60592	774	93.63802338
772	93.63187	772	93.66187286

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768	93.58472	768	93.66470337
766	93.60992	766	93.67063904
764	93.60639	764	93.6630249
762	93.61153	762	93.68276215
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758	93.59565	758	93.63916779
756	93.58328	756	93.64839172
754	93.61688	754	93.65479279
752	93.58768	752	93.62325287
750	93.59282	750	93.66170502
748	93.5874	748	93.65827179
746	93.5944	746	93.67578125
744	93.58605	744	93.63418579
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740	93.57703	740	93.63127136
738	93.58007	738	93.62375641
736	93.58266	736	93.61992645
734	93.60236	734	93.657341
732	93.55734	732	93.62367249
730	93.55971	730	93.61624908
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726	93.59158	726	93.63339996
724	93.57159	724	93.62059021
722	93.56087	722	93.59990692
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716	93.57079	716	93.61896515
714	93.57591	714	93.63233185
712	93.56533	712	93.61670685
710	93.56171	710	93.59432983
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706	93.57524	706	93.61212921
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698	93.55015	698	93.58705139
696	93.5487	696	93.59416199
694	93.53374	694	93.585495
692	93.5371	692	93.59355927
690	93.53227	690	93.57859802
688	93.5471	688	93.59728241
686	93.53149	686	93.57753754
684	93.54396	684	93.58390045
682	93.52686	682	93.5815506
680	93.52266	680	93.56472778
678	93.50967	678	93.56935883
676	93.51689	676	93.55696106
674	93.50786	674	93.54949951
672	93.51836	672	93.56938934
670	93.52074	670	93.54981995
668	93.50976	668	93.54878235
666	93.50307	666	93.5623703
664	93.50361	664	93.55899811
662	93.49895	662	93.55264282
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658	93.50367	658	93.53842163
656	93.49231	656	93.53456116
654	93.51198	654	93.55388641
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648	93.48729	648	93.53079224
646	93.4922	646	93.53340912
644	93.48972	644	93.53640747
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638	93.48467	638	93.53630829
636	93.47575	636	93.52389526

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632	93.47939	632	93.53329468
630	93.48535	630	93.53390503
628	93.47734	628	93.53009796
626	93.47456	626	93.52036285
624	93.4829	624	93.52233887
622	93.47666	622	93.52191925
620	93.47442	620	93.51494598
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596	93.45942	596	93.49094391
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576	93.44974	576	93.46722412
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572	93.44413	572	93.46102142
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568	93.43311	568	93.44271088



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562	93.41364	562	93.43556976
560	93.41569	560	93.432724
558	93.40791	558	93.43102264
556	93.42476	556	93.43024445
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552	93.40553	552	93.42072296
550	93.40092	550	93.41854858
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488	93.32182	488	93.31198883
486	93.32037	486	93.3175354
484	93.32163	484	93.32674408
482	93.31215	482	93.30249786
480	93.28917	480	93.29718018
478	93.29852	478	93.30253601
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470	93.29267	470	93.29207611
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466	93.28084	466	93.28152466
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462	93.26846	462	93.27102661
460	93.24508	460	93.25614929
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454	93.24179	454	93.24604797
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450	93.24263	450	93.23162079
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422	93.1899	422	93.19101715
420	93.19561	420	93.1856842
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414	93.16573	414	93.17605591
412	93.19283	412	93.17447662
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406	93.17242	406	93.14279175
404	93.17122	404	93.15127563
402	93.15699	402	93.13949585
400	93.15278	400	93.13353729
398	93.15673	398	93.13012695
396	93.14473	396	93.12535858
394	93.14255	394	93.11569977
392	93.12738	392	93.1064682
390	93.12503	390	93.0980072
388	93.12193	388	93.10173035
386	93.12657	386	93.0960083
384	93.09785	384	93.07600403
382	93.10299	382	93.08259583
380	93.10244	380	93.07923889
378	93.1077	378	93.07023621
376	93.08918	376	93.04941559
374	93.07417	374	93.05134583
372	93.06441	372	93.05541229
370	93.07894	370	93.05078125
368	93.07809	368	93.03105164
366	93.04377	366	93.01732635
364	93.03969	364	93.00701904

362	93.05159	362	93.01612091
360	93.03917	360	93.01338196
358	93.01239	358	92.96374512
356	93.00984	356	92.9930191
354	93.01628	354	92.97478485
352	93.00381	352	92.96977997
350	92.98276	350	92.9492569
348	92.82365	348	92.64061737
346	92.77177	346	92.6131897
344	92.76224	344	92.65490723
342	92.73333	342	92.6227951
340	92.74005	340	92.61604309
338	92.71543	338	92.57449341
336	92.71478	336	92.5707016
334	92.71417	334	92.59550476
332	92.68725	332	92.5335083
330	92.70289	330	92.55004883
328	92.68297	328	92.52259827
326	92.67513	326	92.51743317
324	92.62492	324	92.47258759
322	92.68723	322	92.51721191
320	92.59232	320	92.44682312
318	92.58653	318	92.46890259
316	92.62808	316	92.45792389
314	92.61865	314	92.41937256
312	92.58687	312	92.43086243
310	92.57797	310	92.38031006
308	92.5668	308	92.42217255
306	92.55358	306	92.37287903
304	92.53469	304	92.35781097
302	92.53277	302	92.37567902
300	92.50138	300	92.36925507
298	92.50694	298	92.31841278
296	92.46326	296	92.31251526

294	92.43874	294	92.24835205
292	92.41822	292	92.25695038
290	92.41981	290	92.25087738
288	92.39227	288	92.18136597
286	92.35854	286	92.16585541
284	92.31767	284	92.12141418
282	92.31509	282	92.12078857
280	92.29362	280	92.09893799
278	92.28429	278	92.06812286
276	92.27422	276	92.0534668
274	92.28699	274	92.04389191
272	92.21114	272	91.9770813
270	92.19811	270	91.95513916
268	92.19334	268	91.97635651
266	92.16317	266	91.92381287
264	92.14125	264	91.90161896
262	92.1354	262	91.89176941
260	92.09853	260	91.8460083
258	92.09751	258	91.84086609
256	92.03618	256	91.79982758
254	91.98206	254	91.73882294
252	91.94899	252	91.68598938
250	91.90473	250	91.63124084
248	91.85211	248	91.59566498
246	91.79362	246	91.51364136
244	91.74727	244	91.46070099
242	91.67188	242	91.40023804
240	91.6122	240	91.32358551
238	91.55367	238	91.27497864
236	91.53355	236	91.23062134
234	91.46812	234	91.1545639
232	91.42357	232	91.11360168
230	91.35675	230	91.06352234
228	91.34	228	91.04704285

226	91.3097	226	91.00288391
224	91.24666	224	90.91398621
222	91.18025	222	90.84008789
220	91.18612	220	90.83506775
218	91.13856	218	90.77082825
216	91.03436	216	90.69219971
214	90.93536	214	90.54979706
212	90.75165	212	90.35773468
210	90.60147	210	90.13367462
208	90.3178	208	89.8266983
206	90.03575	206	89.53794861
204	89.77987	204	89.25837708
202	89.61407	202	89.07461548
200	89.54175	200	88.98794556

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