算法设计与分析——第二章作业

---学院 班级：-------- 姓名：--------- 学号：--------

● 运行结果：

一、　　合并排序

enodebid	longitude	latitude	k_dist
568030	102.676	25.01015	103.075
566670	102.72	25.04582	103.783
567387	102.71	24.99887	107.679
566310	102.711	25.0404	121.091
567883	102.741	25.05223	126.096
566449	102.707	25.04081	128.825
33635	102.701	25.0452	136.177
566714	102.742	25.05291	148.4
567074	102.722	25.09639	161.289
566492	102.71	25.04122	161.578
33246	102.728	25.06391	171.394
33069	102.718	25.07053	173.016
567759	102.741	25.05323	183.765
33158	102.753	25.03358	188.45
565672	102.712	25.04064	189.012
567605	102.722	25.03837	190.333
565623	102.731	25.01009	195.087
567760	102.74	25.05134	195.452
567603	102.724	25.07704	196.968
569113	102.721	25.03847	197.559
566805	102.72	25.03694	197.559
567759	102.74	25.05236	198.127
565820	102.729	25.04168	198.899
567440	102.747	25.08878	200.609
568112	102.748	25.08722	200.609
566054	102.71	25.03491	201.75
566958	102.754	25.03501	201.965
567610	102.726	25.02076	202.631
33099	102.735	25.0499	202.746
568046	102.721	25.09686	202.774
568182	102.679	25.0538	203.213
566623	102.739	25.04984	203.67
566657	102.737	25.05009	203.67
567129	102.697	25.04751	203.713
568177	102.758	25.0007	204.172
565695	102.706	25.03921	204.684
566803	102.741	25.05394	205.009
568184	102.677	25.05402	203.213
565957	102.71	25.03328	206.113
566739	102.739	25.05427	206.125
567389	102.741	25.05389	206.125
565366	102.696	25.0491	206.318
33113	102.743	25.07581	206.464
568175	102.721	25.02431	206.595
567442	102.699	25.0478	206.923
566724	102.726	25.06952	207.014
566769	102.728	25.06994	207.014
565051	102.713	25.0392	207.063
568074	102.753	25.03525	208.475
567609	102.738	25.04096	207.314
566475	102.708	25.03916	209.546
565601	102.722	25.00624	209.559
566403	102.678	25.05546	210.516
565450	102.721	25.00761	211.509
568172	102.726	25.02589	212.159
566788	102.737	25.05893	212.472
565587	102.7	25.0438	212.478
567059	102.709	25.04235	212.48
565660	102.724	25.02648	212.484
565632	102.723	25.02816	212.484
565052	102.698	25.04949	213.456
566320	102.7	25.03926	213.46
568186	102.728	25.04806	213.947
567890	102.722	25.02713	214.319
32775	102.684	25.06	446.98
566414	102.694	25.05383	214.436
566674	102.717	25.06995	215.521
567091	102.719	25.06927	215.521
565367	102.693	25.05213	217.036
566796	102.701	25.04095	217.053
566447	102.699	25.04023	217.053
566324	102.699	25.04212	217.465
566328	102.711	25.04295	217.788
566722	102.732	25.08386	218.327
566798	102.759	25.04389	218.432
567058	102.712	25.04949	226.21
33153	102.737	25.01661	218.773
566598	102.741	25.04609	218.872
567884	102.735	25.059	219.362
567133	102.736	25.05725	219.362
565477	102.725	25.04138	219.368
566592	102.729	25.06515	219.57
32788	102.715	24.98496	220.379
566314	102.702	25.04461	220.944
568120	102.728	25.04014	221.406
565356	102.7	25.04602	222.139
566624	102.733	25.06489	222.156
566474	102.71	25.0398	222.286
566306	102.714	25.04857	223.745

566658	102.744	25.05438	225.316
565365	102.694	25.0496	225.317
566354	102.695	25.05141	225.317
566368	102.678	25.05902	227.308
566343	102.677	25.05719	227.308
568173	102.723	25.02391	229.318
565395	102.724	25.02206	229.318
565829	102.704	25.02925	229.339
567538	102.719	25.04432	229.904
567088	102.721	25.04333	229.904
567306	102.752	25.02722	230.116
566415	102.708	25.0463	230.814
567589	102.722	25.07805	230.878
565625	102.73	25.00758	230.979
567760	102.74	25.05185	233.506
568849	102.721	25.0456	233.518
566603	102.722	25.04371	233.518
568471	102.721	25.0456	233.518
565970	102.678	25.00308	233.744
565969	102.68	25.00414	233.744
568064	102.756	25.0351	233.755
567098	102.725	25.02284	234.28
566423	102.712	25.04485	234.322
33164	102.724	25.02093	235.335
567515	102.746	25.08833	236.543
33075	102.76	25.07573	236.825
567457	102.706	25.04028	236.96
33070	102.731	25.05725	237.699
33186	102.691	25.03239	238.147
565857	102.682	25.01033	238.354
565981	102.68	25.01147	238.354
565448	102.723	25.00818	238.361
568179	102.688	25.05253	238.891
565832	102.709	25.03586	239.259
566342	102.697	25.04139	239.505
566483	102.709	25.05806	239.554
565638	102.721	25.01997	238.399
567232	102.711	25.05806	239.857
566451	102.71	25.06001	239.857
567138	102.719	25.03528	239.995
566262	102.711	25.0527	240.819
566631	102.746	25.04646	241.075
566535	102.734	25.0404	242.493
565368	102.689	25.05273	243.603
567443	102.746	25.05331	244.28
567260	102.748	25.05207	244.28
566655	102.727	25.06794	244.408
568174	102.717	25.02972	244.437
33155	102.738	25.0182	244.703
33116	102.751	25.07364	245.008
33117	102.734	25.0486	245.042
566645	102.739	25.04341	246.549
567081	102.74	25.04139	246.549
33100	102.727	25.06593	246.947
566673	102.732	25.06352	247.456
565669	102.696	25.04662	248.898
567003	102.694	25.04531	248.898
566298	102.708	25.02891	249.574
32777	102.706	25.03023	249.574
33159	102.748	25.02715	250.102
567002	102.746	25.02848	250.102
32841	102.719	25.02111	250.176
33067	102.707	25.0186	250.524
566648	102.712	25.06329	251.245
567076	102.723	25.03982	251.542
567744	102.72	25.03056	252.05
566472	102.686	25.05138	238.891
565523	102.719	25.02848	252.05
568114	102.734	25.0825	252.151
566717	102.725	25.07856	252.158
565964	102.711	24.99689	253.606
567526	102.713	24.99827	253.606
565728	102.732	25.00897	254.268
567646	102.752	25.03361	254.845
566309	102.708	25.03781	254.975
567422	102.719	25.09667	255.447
567467	102.721	25.09526	255.447
567469	102.735	25.0819	255.609
565755	102.733	25.02196	255.61
565749	102.735	25.02337	255.61
567191	102.727	25.0772	252.158
567498	102.714	25.06194	256.025
32789	102.728	25.00667	256.042
33094	102.716	25.04806	257.297
566442	102.714	25.04662	257.297
567116	102.706	25.02066	257.676
566082	102.705	25.01853	257.676
33192	102.709	24.98496	257.722
565773	102.733	24.99605	258.403
566716	102.717	25.05784	258.689
566895	102.74	25.03019	267.952
566416	102.685	25.05222	259.026
567875	102.708	25.0329	259.722
567111	102.709	25.03075	259.722
565745	102.721	25.02244	259.764
567139	102.744	25.02922	261.57
567072	102.693	25.04028	261.647
566393	102.691	25.03878	261.647
568061	102.745	25.03139	263.438
566259	102.701	25.04822	264.135
566768	102.741	25.07621	266.7
567109	102.702	25.02768	266.91
566678	102.713	25.05983	266.912
567342	102.751	25.08444	267.11
566289	102.714	25.04328	267.256
565440	102.731	25.02333	267.646
567709	102.733	25.02491	267.646
565906	102.688	25.03428	267.95
566993	102.747	25.04449	268.978
567238	102.748	25.04673	268.978
565830	102.712	25.03488	269.102
567073	102.689	25.05861	269.589

567063	102.691	25.057	269.589
565562	102.721	25.00459	269.139
568109	102.733	25.07525	270.001
32778	102.709	24.99853	271.965
566725	102.759	25.07765	272.018
566741	102.736	25.09703	272.742
33132	102.693	25.05319	273.544
565382	102.691	25.05485	273.544
565578	102.769	25.01036	273.596
567193	102.728	25.07907	274.136
565420	102.706	25.04153	274.312
32776	102.704	25.0432	274.312
32997	102.736	25.00639	274.961
566794	102.724	25.0721	275.174
566601	102.724	25.05235	275.813
565370	102.687	25.0493	275.818
566804	102.742	25.04308	275.826
566801	102.755	25.07842	275.857
566662	102.728	25.07489	276.209
565407	102.693	25.05614	276.215
566628	102.723	25.07573	277.245
33636	102.7	25.0228	277.985
567474	102.698	25.02108	277.985
566711	102.698	25.05638	278.022
568102	102.726	25.0475	278.877
566004	102.677	25.04196	278.881
566712	102.679	25.04369	278.881
567553	102.735	25.09854	279.313
567267	102.753	25.085	279.317
32881	102.685	25.0475	279.329
568850	102.734	25.00471	279.342
33566	102.733	25.00237	279.342
565457	102.738	25.01349	279.687
568116	102.725	25.08389	279.755
567328	102.739	25.08912	279.94
565593	102.734	25.00464	280.313
568118	102.737	25.09	280.368
565505	102.739	25.01585	280.376
566639	102.718	25.0557	280.564
33108	102.716	25.05395	280.564
567077	102.726	25.07035	280.622
567591	102.736	25.07486	281.295
566486	102.711	25.03744	281.409
568099	102.728	25.05093	281.577
566637	102.73	25.04917	281.577
565691	102.732	25.00657	289.107
567618	102.728	25.00144	281.869
565912	102.687	25.03651	282.292
566095	102.692	25.02851	282.771
566615	102.72	25.06447	283.51
568113	102.748	25.09116	283.89
567231	102.719	25.06508	285.042
566666	102.718	25.06268	285.042
566669	102.732	25.04735	285.491
566737	102.731	25.08485	285.557
567245	102.73	25.08245	285.557
567264	102.723	25.04131	285.882
566293	102.714	25.04479	285.888
566650	102.716	25.04661	285.888
566652	102.738	25.04766	288.486
567212	102.685	25.03828	288.592
567125	102.726	25.073	291.43
565721	102.731	25.01599	291.497
566363	102.761	25.06599	292.245
565757	102.715	25.02998	292.562
33133	102.693	25.04713	292.662
565677	102.784	25.00093	292.78
565445	102.727	25.0204	292.879
566280	102.709	25.05152	293.715
567291	102.749	25.08686	293.834
33114	102.742	25.07373	293.909
565828	102.713	25.03191	294.709
566963	102.754	25.03168	294.788
566757	102.735	25.08825	294.846
567470	102.734	25.08576	294.846
565804	102.737	25.04005	295.513
566944	102.735	25.03811	295.513
566065	102.712	25.02957	297.061
565681	102.758	24.99004	297.071
567135	102.727	25.04636	297.136
565559	102.721	24.98533	297.202
565558	102.723	24.98729	297.202
567315	102.738	25.00442	297.836
565877	102.703	25.02029	298.11
33184	102.702	25.02281	298.11
567865	102.678	25.00506	298.114
566865	102.69	25.03229	299.611
567694	102.69	25.02781	300.44
566005	102.686	25.01923	301.275
567492	102.698	25.03638	302.167
565436	102.736	25.03555	302.3
566260	102.698	25.0514	302.544
565455	102.76	25.06403	302.585
567041	102.763	25.06409	302.585
566003	102.681	25.04055	302.62
565868	102.678	25.0406	302.62
567355	102.743	25.01111	302.645
565608	102.73	25.0024	302.682
565894	102.708	24.98295	302.713
565865	102.711	24.98294	302.713
566671	102.743	25.04148	302.733
566742	102.749	25.05319	302.823
567099	102.74	25.01944	302.843
567409	102.688	25.05472	302.869
565994	102.687	25.03241	302.884
566965	102.775	25.03839	302.911
566081	102.69	24.9962	302.973
566399	102.688	25.05717	303.065
566597	102.724	25.04577	303.148
565720	102.735	24.9946	303.18
565774	102.737	25.01158	303.232
565780	102.74	25.01175	303.232

565463	102.742	25.01567	303.293
567204	102.677	25.00758	303.357
567524	102.68	25.00236	303.401
565482	102.73	25.02891	303.416
565732	102.761	24.98979	303.432
565461	102.743	25.01934	303.439
565607	102.74	25.01954	303.439
566668	102.714	25.05761	303.608
33112	102.734	25.08461	303.618
565729	102.719	25.02448	303.76
568066	102.744	25.01248	303.815
565393	102.714	24.9832	304.091
566614	102.723	25.0698	304.099
566605	102.722	25.03693	304.134
33077	102.719	25.03721	304.134
33078	102.757	25.07601	304.141
565965	102.683	25.02012	304.267
567303	102.769	24.98569	304.305
567510	102.714	24.99719	304.513
566459	102.684	25.04984	279.329
567415	102.745	25.07616	304.537
566682	102.716	25.04944	304.637
565951	102.693	25.03125	304.681
566764	102.75	25.07566	305.024
565682	102.76	25.00045	305.166
568864	102.687	25.04555	305.403
565369	102.689	25.04761	305.403
565360	102.748	25.00737	305.446
565850	102.678	25.01278	305.895
565526	102.736	25.02532	306.03
565976	102.732	25.05858	306.116
566028	102.685	25.02209	306.294
565861	102.688	25.02981	306.502
565489	102.752	25.02295	307.03
566058	102.696	25.03157	307.082
565903	102.699	25.0311	307.082
567010	102.756	25.02861	307.089
567693	102.751	25.02556	307.03
567205	102.68	25.00805	307.139
33162	102.757	24.97146	307.228
565634	102.73	25.02088	307.299
568176	102.74	25.0111	307.341
565905	102.69	25.03602	307.457
566610	102.721	25.06708	307.544
565595	102.763	25.00639	307.79
567481	102.694	24.99722	307.802
567199	102.684	25.02469	307.928
566772	102.75	25.07291	307.979
566735	102.753	25.07239	307.979
566684	102.732	25.04388	308.048
566651	102.729	25.0444	308.048
566799	102.742	25.07843	308.172
567025	102.716	25.03245	308.438
565971	102.679	25.01667	308.983
565622	102.735	25.00954	309.226
565430	102.782	25.00177	309.245

565636	102.719	25.03187	309.332
567347	102.757	25.08011	309.519
567889	102.754	25.0807	309.519
566006	102.678	25.04459	309.655
566370	102.697	25.0444	309.917
566981	102.757	25.02602	310.47
566986	102.759	25.02814	310.47
566681	102.719	25.07741	310.755
33110	102.731	25.0864	310.811
565438	102.774	24.98175	311.241
565496	102.73	24.99315	311.352
566627	102.725	25.06457	311.463
566068	102.696	24.99931	311.886
567413	102.693	24.99863	311.886
567295	102.687	25.01689	312.008
565914	102.685	25.01475	312.008
566316	102.722	24.98361	312.331
565627	102.725	24.98292	312.331
565550	102.701	25.03251	312.817
565403	102.723	24.98095	312.936
566686	102.718	25.05323	312.99
567882	102.731	25.02706	313.017
566608	102.73	25.0689	314.108
566751	102.76	25.04694	314.159
566740	102.729	25.06275	314.423
33157	102.753	25.00966	314.551
565563	102.75	25.00889	314.551
567286	102.68	25.01984	306.576
33235	102.745	24.96126	314.696
565042	102.735	25.04222	314.878
565926	102.703	25.02549	314.927
566718	102.731	25.07671	315.004
566749	102.734	25.0775	315.004
566394	102.696	25.0384	315.096
566392	102.693	25.03761	315.096
567110	102.691	25.02258	315.132
567257	102.738	25.04528	315.548
567134	102.734	25.04517	315.557
566083	102.691	25.01077	315.595
567505	102.762	25.07684	315.632
33134	102.71	25.04731	315.726
567310	102.739	25.00841	315.88
565974	102.71	25.01311	316.105
565630	102.726	24.99967	316.134
565801	102.723	25.00049	316.134
566719	102.737	25.07667	316.276
565594	102.761	25.00825	316.764
565980	102.688	25.02124	317.064
567202	102.733	25.09045	317.227
568181	102.683	25.05368	317.263
567459	102.724	25.08222	317.324
566758	102.727	25.08136	317.324
566641	102.75	25.06968	317.553
566607	102.729	25.05945	317.648
567658	102.744	25.06604	317.766
568100	102.745	25.06333	317.766

567190	102.731	25.07891	317.941
567622	102.734	25.07979	317.941
565631	102.72	24.99991	318.182
567885	102.733	25.06814	318.311
566629	102.736	25.06903	318.311
566112	102.729	25.05302	318.349
567087	102.732	25.05213	318.349
565810	102.777	24.99213	318.946
33629	102.692	24.995	319.219
567082	102.719	25.05898	319.39
566422	102.713	25.05487	319.471
567097	102.775	24.99556	320.366
565973	102.693	25.02066	319.62
566079	102.696	25.02158	319.62
565402	102.747	24.98997	319.828
565822	102.682	25.03012	320.178
565459	102.747	25.01272	320.208
565652	102.746	25.00999	320.208
568069	102.755	24.98361	320.689
565616	102.721	25.03411	320.736
566611	102.721	25.07306	320.813
566635	102.736	25.05523	320.854
565610	102.717	24.98675	321.013
565859	102.714	24.98579	321.013
567095	102.739	25.05618	320.713
565532	102.763	25.0001	321.268
567269	102.764	24.99736	321.268
567137	102.743	25.05619	321.579
565740	102.772	24.99462	321.743
565565	102.775	24.99364	321.743
33547	102.743	24.97851	322.31
566093	102.702	24.995	322.502
566226	102.733	25.05422	322.751
566057	102.694	25.05898	322.859
565598	102.697	25.05797	322.859
566616	102.726	25.05404	323.143
567149	102.681	24.99955	323.269
566496	102.707	25.0496	323.31
566263	102.71	25.04858	323.31
565479	102.738	25.03708	323.573
568119	102.751	25.06028	323.638
566327	102.707	25.04558	323.949
568183	102.704	25.04662	323.949
33074	102.761	25.07994	324.86
33120	102.721	25.0797	325.035
567323	102.763	24.96992	325.331
565736	102.76	24.97099	325.331
568178	102.68	25.05827	325.54
566067	102.702	25.03517	325.591
566224	102.754	25.06449	325.939
566225	102.757	25.0634	325.939
566765	102.748	25.07805	326.994
567542	102.78	24.97825	326.01
565768	102.766	25.00589	326.073
565486	102.769	25.0048	326.073
566638	102.735	25.04238	326.44

566654	102.751	25.06697	326.795
567888	102.753	25.06928	326.795
565618	102.728	25.02594	327.282
567224	102.687	25.01296	327.312
566080	102.682	25.01132	327.613
565986	102.683	25.00852	327.613
565371	102.694	25.04252	327.673
566793	102.716	25.06501	328.554
566344	102.685	25.05588	328.852
566636	102.736	25.05309	329.823
566761	102.746	25.055	330.264
565654	102.724	25.03103	335.031
566766	102.747	25.07411	330.671
566604	102.74	25.06162	330.877
568106	102.742	25.06201	331.2
566643	102.744	25.05965	331.2
566023	102.688	25.00276	331.61
33156	102.74	25.00392	331.855
566059	102.684	25.03119	331.671
33161	102.739	25.00108	331.855
567270	102.767	24.9983	331.973
567602	102.753	25.07601	332.335
567130	102.691	25.04101	332.569
565904	102.688	25.03977	332.569
33181	102.675	25.00996	333.02
565735	102.762	24.98757	335.703
565473	102.748	24.96125	333.209
566404	102.693	25.03451	333.511
567067	102.696	25.03577	333.511
565380	102.741	25.02796	333.526
567381	102.769	24.99274	333.608
566134	102.715	25.0419	333.638
567207	102.726	25.04313	333.962
566040	102.684	24.99853	333.978
565979	102.688	25.02337	334.481
565648	102.728	24.99528	334.806
567745	102.73	25.07374	335.036
566679	102.742	25.04471	335.34
565571	102.719	25.01253	335.46
565733	102.764	24.98998	335.703
566664	102.735	25.06573	335.893
33195	102.702	25.02837	336.306
566653	102.716	25.05108	336.341
566634	102.719	25.04976	336.341
33109	102.761	25.04314	336.404
568104	102.738	25.08306	336.514
565743	102.77	24.98802	336.627
33234	102.759	25.01729	551.784
566602	102.746	25.05753	337.305
566391	102.68	25.05234	337.314
566278	102.704	25.04825	337.817
565869	102.689	25.00859	337.904
565414	102.766	24.97087	338.218
565490	102.744	25.00821	338.328
565962	102.704	24.99281	338.375
565516	102.719	24.98908	338.444

566806	102.743	25.08971	339.076
566626	102.733	25.06149	339.272
566646	102.748	25.06559	339.277
566871	102.736	25.10088	339.708
565754	102.733	25.01738	340.346
565883	102.702	24.99037	338.375
565840	102.779	25.00424	340.633
565744	102.776	25.00284	340.633
565431	102.74	25.00689	341.048
565851	102.676	25.01611	341.41
566091	102.675	25.01318	341.41
566002	102.686	25.00994	341.441
566277	102.713	25.05252	341.603
567491	102.707	24.9864	342.526
565844	102.71	24.98784	342.526
565379	102.743	25.03291	342.947
565620	102.74	25.03436	342.947
566744	102.752	25.05733	343.208
567071	102.69	25.04427	343.451
568171	102.721	25.01574	343.51
33079	102.764	25.07934	343.676
565577	102.719	25.01994	343.731
565896	102.704	24.98241	343.767
566297	102.729	25.05612	343.95
567293	102.745	25.09264	344.139
566315	102.705	25.03625	344.596
565442	102.697	25.02861	344.598
566957	102.772	25.02147	344.634
566748	102.721	25.08073	345.069
565383	102.684	25.04779	346.109
565408	102.734	25.01446	347.267
566738	102.751	25.07917	347.347
567485	102.754	25.08734	347.459
565564	102.775	24.97399	348.297
567376	102.747	25.06812	348.525
565902	102.683	25.03643	348.784
33182	102.681	25.03387	348.784
565605	102.756	24.98522	349.196
565723	102.758	24.98266	349.196
33118	102.731	25.08811	350.005
566755	102.729	25.09068	350.005
566593	102.726	25.03823	350.541
567483	102.683	25.00255	350.616
565998	102.682	25.01405	350.988
565456	102.75	25.0143	350.993
567285	102.749	25.01732	350.993
567500	102.717	24.99468	350.998
565898	102.718	24.9977	350.998
568755	102.693	24.98306	351.001
33589	102.692	24.98608	351.001
567617	102.706	25.02632	351.886
567263	102.719	25.04209	352.116
33122	102.676	25.05218	352.209
567417	102.726	25.00926	352.452
566976	102.769	25.0224	352.802
565968	102.707	25.00328	352.887

565900	102.71	25.00165	352.887
565621	102.73	24.99768	352.899
567411	102.881	25.05111	356.326
567461	102.701	24.98132	352.987
33051	102.74	25.02501	353.013
566090	102.687	25.04281	353.12
565506	102.779	25.0012	353.232
565481	102.743	24.98227	353.756
565497	102.745	24.97966	353.756
567354	102.726	25.03216	354.19
565501	102.727	25.02911	354.19
566777	102.747	25.08056	354.566
567208	102.75	25.08222	354.566
567494	102.727	25.08389	354.795
565813	102.78	24.99046	355.221
33172	102.724	25.01398	360.395
565521	102.795	24.99083	357.16
567747	102.722	25.01133	357.944
566048	102.689	24.99328	358.159
566773	102.741	25.08173	358.575
566159	102.706	25.05979	358.621
566956	102.754	25.06	359.19
565950	102.697	25.02454	359.293
568059	102.748	24.98361	359.314
567964	102.697	25.01694	404.081
567298	102.682	25.01702	359.532
567531	102.711	24.99095	360.073
567290	102.77	25.10037	360.075
565560	102.733	25.02974	360.14
567497	102.727	25.00455	361.031
567598	102.74	25.08677	361.219
566362	102.755	25.06658	361.95
565396	102.732	25.03769	362.901
566941	102.742	24.96049	363.681
566754	102.732	25.0925	364.032
566756	102.741	25.09185	364.707
565551	102.722	24.99044	364.884
565658	102.76	24.96316	364.917
566864	102.711	25.02706	366.031
568020	102.696	25.01833	366.536
566432	102.715	25.03878	366.383
566647	102.726	25.05759	366.596
565955	102.706	25.02363	366.665
566660	102.718	25.07312	367.006
565975	102.704	25.01536	367.018
565817	102.735	25.0325	367.548
568054	102.759	24.99255	367.584
565999	102.694	25.02673	367.921
567313	102.738	25.08	369.084
565775	102.739	25.03338	369.156
565641	102.761	25.00364	369.162
565576	102.769	24.97903	369.292
565378	102.682	25.04501	369.398
33163	102.738	25.03018	370.227
565642	102.751	25.02908	370.985
566677	102.722	25.05223	371.261

566625	102.724	25.04943	371.261
565824	102.687	24.99608	371.311
33063	102.728	25.01793	371.782
567528	102.764	25.09667	371.883
565845	102.713	25.00266	403.809
565913	102.683	25.04179	372.367
566092	102.696	24.99005	373.937
567261	102.694	24.98722	373.937
566599	102.739	25.06927	374.052
33115	102.741	25.0721	374.052
568185	102.704	25.04762	374.323
567891	102.725	24.98583	374.97
565633	102.727	24.98867	374.97
565639	102.777	25.00708	375.047
565753	102.723	25.00299	375.591
33119	102.724	25.05031	372.291
565494	102.749	24.9882	375.721
565760	102.751	24.98535	375.721
566600	102.742	25.04783	375.968
567294	102.745	24.9625	376.472
566980	102.762	25.02931	376.659
566007	102.693	25.00913	376.662
566069	102.694	25.01239	376.662
566591	102.748	25.06131	377.134
33111	102.727	25.09178	377.416
33106	102.725	25.08891	377.416
565624	102.732	25.01159	377.86
565758	102.766	24.97713	379.778
565674	102.769	24.97507	380.455
565808	102.772	24.973	380.455
567488	102.745	24.95842	380.483
33562	102.727	25.08679	380.625
565592	102.746	25.00531	380.693
566644	102.737	25.06282	380.927
568122	102.81	25.03869	381.609
565640	102.758	25.00573	381.748
566031	102.69	25.01408	382.027
565705	102.783	24.99846	382.03
566612	102.73	25.04096	382.552
566732	102.757	25.05789	383.003
565756	102.746	24.98604	386.372
565508	102.772	24.99148	386.569
565719	102.724	25.01429	386.748
33194	102.713	25.01367	387.316
565572	102.718	24.98313	389.371
565805	102.774	25.00583	389.894
565354	102.695	25.06097	390.133
565841	102.704	24.98862	390.769
567007	102.77	25.02722	390.836
566974	102.767	25.025	390.836
566734	102.749	25.09179	391.06
567188	102.687	24.9833	391.49
565878	102.677	25.03738	392.06
565983	102.708	24.99086	392.1
567895	102.722	25.05806	393.841
566971	102.77	25.01896	396.002

565579	102.772	25.00891	397.539
565435	102.755	24.99419	403.579
566802	102.755	25.05078	397.695
567439	102.757	25.0477	397.695
566656	102.723	25.06148	398.836
567256	102.754	25.05556	398.858
566775	102.777	25.04042	399.013
566789	102.737	25.0725	399.222
565647	102.76	24.99776	399.329
565881	102.68	24.99802	400.06
565982	102.683	24.99567	400.06
567897	102.704	25.05668	400.474
567236	102.746	25.02611	400.595
566970	102.781	25.02208	401.032
567209	102.778	25.02444	401.032
565480	102.782	24.98055	402.472
566596	102.733	25.07245	403.364
566467	102.68	25.06004	403.386
565513	102.747	25.01923	403.681
566978	102.778	25.01629	403.806
565997	102.711	25.01878	403.973
565491	102.756	25.00042	403.571
566044	102.701	25.01675	404.081
567640	102.773	25.04018	404.31
566778	102.787	25.03998	404.449
565766	102.766	25.00183	404.511
565613	102.754	24.96448	408.392
565566	102.77	25.00208	404.511
565961	102.705	24.99633	404.626
565458	102.754	25.01457	404.629
566945	102.871	25.0472	404.693
565646	102.763	24.99391	404.868
565680	102.759	24.9942	404.868
565488	102.753	25.02049	405.263
565535	102.757	25.02015	405.263
567322	102.761	25.04958	405.608
566011	102.711	25.01664	405.7
565827	102.715	25.03603	406.468
565666	102.729	24.98248	406.577
565888	102.716	25.01123	406.654
565582	102.767	25.01202	406.756
565671	102.773	24.97654	406.786
565696	102.747	25.0413	406.947
565750	102.759	25.06022	407.415
566000	102.714	25.00803	409.393
565612	102.745	24.96667	407.798
567585	102.739	25.09949	407.987
565035	102.868	25.02639	408.191
565027	102.872	25.02694	408.191
565659	102.758	24.96504	408.392
33180	102.698	24.9878	408.697
565416	102.767	24.99489	408.922
566055	102.688	24.9867	409.462
567203	102.747	25.03906	410.107
566261	102.709	25.05438	407.126
565352	102.699	25.06164	410.235

568056	102.729	24.98516	410.46
565355	102.705	25.05367	410.945
565643	102.756	24.99704	411.45
565806	102.764	24.97409	411.459
565419	102.724	25.0172	411.603
567320	102.753	25.01806	411.713
565524	102.729	25.0141	411.899
567547	102.757	25.04389	411.942
567287	102.696	25.00667	412.066
567175	102.697	25.00308	412.066
565925	102.702	24.98491	412.287
565600	102.736	24.96811	412.367
565710	102.732	24.96735	412.367
567604	102.727	25.08563	412.378
565958	102.709	25.02318	412.638
567009	102.769	25.03306	412.804
566988	102.765	25.03384	412.804
565819	102.783	24.98405	413.246
567557	102.732	25.09597	414.197
566877	102.728	25.09512	414.197
566728	102.776	25.04389	414.411
33140	102.705	25.0524	415.165
567896	102.7	25.05466	415.573
567701	102.743	25.085	416.133
565759	102.774	25.00044	416.215
33238	102.77	24.99953	416.215
567023	102.777	25.01872	416.45
566972	102.774	25.01615	416.45
565492	102.726	24.99137	416.655
567159	102.686	25.00512	416.781
565415	102.731	25.03302	417.148
565531	102.733	25.001	417.574
566785	102.79	25.0544	418.008
566590	102.741	25.06598	418.094
565525	102.771	24.9824	418.16
565454	102.758	25.08773	418.393
33577	102.755	25.09033	418.393
565510	102.773	24.9867	418.972
566468	102.71	25.06299	419.824
565604	102.763	25.01156	420.091
565684	102.776	24.98941	420.115
567163	102.744	25.01534	420.454
566012	102.717	25.00566	420.754
567167	102.774	24.99843	421.569
566969	102.758	25.03616	423.266
565884	102.675	25.03436	423.44
565864	102.679	25.03321	423.44
565739	102.779	24.98485	423.729
565673	102.777	24.9815	423.729
565427	102.692	24.98387	424.217
565464	102.757	24.96133	425.147
567061	102.7	25.05302	425.241
33048	102.717	24.97778	425.445
565889	102.709	25.00537	426.221
565410	102.715	25.0187	426.453
566979	102.763	25.02605	420.065

566074	102.715	24.99039	429.13
565606	102.743	25.02337	429.421
33095	102.716	25.0771	429.838
567078	102.714	25.07369	429.838
567522	102.738	24.99444	430.183
565689	102.735	24.99719	430.183
565678	102.783	24.98883	430.509
565498	102.74	24.9795	432.111
568097	102.781	25.05361	433.102
565637	102.767	25.00968	433.795
565468	102.752	24.96269	434.346
565737	102.76	24.97677	435.13
565978	102.713	24.97657	425.445
566975	102.776	25.02295	435.826
566783	102.746	25.05021	436.755
565675	102.72	24.99393	437.786
565609	102.778	24.9965	439.131
565661	102.756	24.97531	440.3
566010	102.717	25.00279	440.898
566949	102.874	25.04782	440.97
566948	102.878	25.04942	440.97
565734	102.766	24.98597	441.156
566412	102.705	25.06303	441.38
565334	102.701	25.06142	441.38
566750	102.751	25.04916	441.824
565724	102.715	25.02158	442.871
567094	102.722	25.05594	443.223
568027	102.746	24.97556	446.31
565668	102.732	24.98221	446.626
566967	102.751	25.04082	448.388
567326	102.677	25.02028	449.365
567089	102.743	25.0384	449.817
565800	102.741	24.98383	450.815
568098	102.754	25.05378	443.676
567568	102.742	24.98778	450.815
33575	102.748	25.06329	451.678
567244	102.784	25.05397	453.568
567527	102.788	25.05583	453.568
566763	102.767	25.09286	454.328
565885	102.707	25.01229	456.488
565527	102.731	24.99065	457.652
566073	102.698	24.98295	458.811
33160	102.76	25.03218	461.012
565667	102.732	24.98664	457.652
566984	102.767	25.02933	461.131
565645	102.704	25.05773	463.071
565602	102.758	24.96724	463.88
566753	102.738	25.09538	463.903
565529	102.754	24.96711	464.81
565472	102.739	24.96919	465.08
565471	102.743	24.96711	465.08
565657	102.778	24.97742	465.258
567266	102.689	25.00074	466.714
567241	102.752	24.99916	467.504
566985	102.749	24.96615	467.693
567892	102.747	24.96994	467.693

567319	102.761	24.97945	468.322
567265	102.76	25.08333	469.267
565635	102.748	25.03577	469.607
566680	102.713	25.06824	469.887
565412	102.755	25.00454	469.928
565048	102.769	25.08944	471.047
566874	102.73	25.09895	471.623
565767	102.764	25.01528	472.531
568110	102.773	25.04715	472.652
565514	102.782	24.99426	474.278
567441	102.763	25.05667	475.755
567615	102.756	24.98925	475.995
567767	102.699	24.996	476.844
567183	102.739	24.96481	478.021
567157	102.808	25.0416	479.011
565350	102.764	25.05988	479.381
566999	102.756	25.04007	479.729
565722	102.715	25.02351	483.859
567353	102.681	25.0252	486.818
566321	102.679	25.02918	486.818
565381	102.678	25.04748	488.2
566720	102.764	25.04446	488.83
567292	102.746	25.09517	482.743
567465	102.754	25.01175	493.36
566982	102.761	25.02197	496.973
565835	102.685	24.99159	496.993
565478	102.787	24.98666	497.307
566987	102.763	25.03573	497.635
567027	102.787	25.02166	497.99
567173	102.696	25.00219	498.304
567220	102.793	25.00121	500.165
565397	102.796	24.99763	500.165
565487	102.758	25.00909	500.513
567546	102.778	25.04714	504.256
566787	102.785	25.09031	504.318
566943	102.782	25.01902	505.143
565509	102.753	24.98119	505.151
568101	102.767	25.09472	505.495
565512	102.727	24.97864	478.58
566779	102.768	25.03981	505.964
567299	102.758	25.06988	508.568
566947	102.884	25.05077	510.055
565726	102.754	24.9711	510.265
565424	102.766	24.98025	512.331
566745	102.769	25.04359	513.484
566013	102.704	24.97406	514.622
565765	102.734	24.97236	514.667
567248	102.719	24.97806	516.5
33545	102.787	24.99018	517.855
567596	102.792	24.98913	517.855
33073	102.786	25.09205	518.471
566996	102.872	25.05215	522.512
565561	102.74	24.99878	523.162
568065	102.865	25.02806	528.19
565537	102.768	24.96843	531.208
565584	102.798	24.99042	534.74

567008	102.772	25.03164	531.575
567574	102.772	25.09438	531.705
566072	102.709	24.9734	533.609
565520	102.782	25.0055	534.208
567600	102.867	25.04749	534.254
565522	102.795	24.99438	534.74
565676	102.74	24.95721	522.289
566747	102.765	25.0492	537.206
566726	102.763	25.09098	543.092
566759	102.761	25.09551	543.092
567357	102.709	24.97619	545.587
567601	102.704	24.97806	545.587
565664	102.729	24.9671	548.812
567580	102.675	24.99597	553.677
567336	102.87	25.03667	563.028
565030	102.868	25.03194	563.028
566066	102.695	24.97851	564.104
566026	102.699	24.97497	564.104
566781	102.782	25.04231	567.074
567011	102.785	25.02575	574.198
567626	102.784	25.05901	542.472
567184	102.739	24.9623	575.534
565665	102.752	24.95882	576.806
565031	102.868	25.04278	577.898
565764	102.736	24.9774	596.246
566557	102.772	25.09769	602.687
565596	102.728	24.97195	607.193
567715	102.804	25.03928	608.7
567075	102.75	24.97588	608.809
566977	102.883	25.05617	609.526
566795	102.778	25.05083	612.739
566743	102.772	25.04996	612.739
566731	102.767	25.0544	612.994
567506	102.704	24.97184	613.174
567537	102.798	25.04028	615.236
568121	102.792	25.05111	615.57
568115	102.796	25.05529	615.57
567619	102.736	24.97529	618.512
566946	102.889	25.05146	621.359
565585	102.801	24.99564	621.4
567021	102.881	25.04585	625.702
566049	102.702	25.01001	628.806
565466	102.746	24.9555	634.768
565046	102.78	25.09017	640.069
565433	102.749	24.9922	644.516
565045	102.783	25.09583	647.035
566983	102.777	25.03532	649.729
566767	102.755	25.0933	652.989
567194	102.874	25.02861	653.841
566770	102.768	25.10243	664.088
568117	102.802	25.05056	675.894
567893	102.873	25.05611	687.707
568075	102.875	25.03472	687.71
567157	102.812	25.03658	689.232
566997	102.775	24.97055	696.678
566784	102.791	25.03979	708.076

566038	102.686	24.98032	722.988
565547	102.791	25.00261	730.589
566022	102.676	24.99248	737.023
565028	102.872	25.02222	748.165
568209	102.879	25.02444	748.165
566989	102.782	25.01369	753.612
565037	102.882	25.03722	758.891
567222	102.791	25.03972	708.696
566991	102.854	25.04113	801.405
566992	102.86	25.04585	801.405
567530	102.787	25.06306	810.249
567489	102.886	25.04014	811.37
566968	102.887	25.06884	811.387
568072	102.851	25.03639	819.788
33248	102.77	25.07832	823.261
565029	102.874	25.06222	827.782
566966	102.82	25.03464	835.284
567718	102.891	25.0747	842.528
566821	102.895	25.06806	842.528
566960	102.89	25.05914	860.861
565034	102.866	25.06056	861.984
566762	102.746	25.10047	877.553
567016	102.79	25.01929	878.178
566018	102.772	25.0862	896.523
565036	102.859	25.034	896.784
565043	102.805	25.05161	914.185
33096	102.755	25.09944	914.484
566786	102.795	25.0895	950.703
567699	102.797	25.0146	1011.904
567741	102.823	25.03	1033.891
566776	102.794	25.08555	1050.747
564595	102.836	25.09583	1096.024
567258	102.805	25.08606	1110.463
566730	102.8	25.04476	675.894
33237	102.895	25.05019	1111.201
566942	102.843	25.03769	1173.66
568297	102.828	25.08917	1183.439
568298	102.831	25.09944	1183.439
566990	102.833	25.03204	1188.646
565033	102.88	25.07889	1322.606
565026	102.872	25.01466	1366.484
568068	102.804	25.02111	1426.698
565041	102.782	25.07667	1463.873
565044	102.803	25.0675	1531.77
565047	102.812	25.065	1649.266
564499	102.867	25.09281	2029.692
565025	102.895	25.095	2346.039
568313	102.863	25.09831	2735.798

二、 快速排序

enodebid	longitude	latitude	k_dist
568030	102.676	25.01015	103.075
566670	102.72	25.04582	103.783
567387	102.71	24.99887	107.679
566310	102.711	25.0404	121.091
567883	102.741	25.05223	126.096
566449	102.707	25.04081	128.825
33635	102.701	25.0452	136.177
566714	102.742	25.05291	148.4
567074	102.722	25.09639	161.289
566492	102.71	25.04122	161.578
33246	102.728	25.06391	171.394
33069	102.718	25.07053	173.016
567759	102.741	25.05323	183.765
33158	102.753	25.03358	188.45
565672	102.712	25.04064	189.012
567605	102.722	25.03837	190.333
565623	102.731	25.01009	195.087
567760	102.74	25.05134	195.452
567603	102.724	25.07704	196.968
569113	102.721	25.03847	197.559
566805	102.72	25.03694	197.559
567759	102.74	25.05236	198.127
565820	102.729	25.04168	198.899
568112	102.748	25.08722	200.609
567440	102.747	25.08878	200.609
566054	102.71	25.03491	201.75
566958	102.754	25.03501	201.965
567610	102.726	25.02076	202.631
33099	102.735	25.0499	202.746
568046	102.721	25.09686	202.774
568184	102.677	25.05402	203.213
568182	102.679	25.0538	203.213
566657	102.737	25.05009	203.67
566623	102.739	25.04984	203.67
567129	102.697	25.04751	203.713
568177	102.758	25.0007	204.172
565695	102.706	25.03921	204.684
566803	102.741	25.05394	205.009
565957	102.71	25.03328	206.113
567389	102.741	25.05389	206.125
566739	102.739	25.05427	206.125
565366	102.696	25.0491	206.318
33113	102.743	25.07581	206.464
568175	102.721	25.02431	206.595
567442	102.699	25.0478	206.923
566769	102.728	25.06994	207.014
566724	102.726	25.06952	207.014
565051	102.713	25.0392	207.063
567609	102.738	25.04096	207.314
568074	102.753	25.03525	208.475
566475	102.708	25.03916	209.546
565601	102.722	25.00624	209.559
566403	102.678	25.05546	210.516

565450	102.721	25.00761	211.509
568172	102.726	25.02589	212.159
566788	102.737	25.05893	212.472
565587	102.7	25.0438	212.478
567059	102.709	25.04235	212.48
565660	102.724	25.02648	212.484
565632	102.723	25.02816	212.484
565052	102.698	25.04949	213.456
566320	102.7	25.03926	213.46
568186	102.728	25.04806	213.947
567890	102.722	25.02713	214.319
566414	102.694	25.05383	214.436
567091	102.719	25.06927	215.521
566674	102.717	25.06995	215.521
565367	102.693	25.05213	217.036
566796	102.701	25.04095	217.053
566447	102.699	25.04023	217.053
566324	102.699	25.04212	217.465
566328	102.711	25.04295	217.788
566722	102.732	25.08386	218.327
566798	102.759	25.04389	218.432
33153	102.737	25.01661	218.773
566598	102.741	25.04609	218.872
567884	102.735	25.059	219.362
567133	102.736	25.05725	219.362
565477	102.725	25.04138	219.368
566592	102.729	25.06515	219.57
32788	102.715	24.98496	220.379
566314	102.702	25.04461	220.944
568120	102.728	25.04014	221.406
565356	102.7	25.04602	222.139
566624	102.733	25.06489	222.156
566474	102.71	25.0398	222.286
566306	102.714	25.04857	223.745
566658	102.744	25.05438	225.316
566354	102.695	25.05141	225.317
565365	102.694	25.0496	225.317
567058	102.712	25.04949	226.21
566368	102.678	25.05902	227.308
566343	102.677	25.05719	227.308
568173	102.723	25.02391	229.318
565395	102.724	25.02206	229.318
565829	102.704	25.02925	229.339
567538	102.719	25.04432	229.904
567088	102.721	25.04333	229.904
567306	102.752	25.02722	230.116
566415	102.708	25.0463	230.814
567589	102.722	25.07805	230.878
565625	102.73	25.00758	230.979
567760	102.74	25.05185	233.506
568849	102.721	25.0456	233.518
568471	102.721	25.0456	233.518
566603	102.722	25.04371	233.518
565970	102.678	25.00308	233.744
565969	102.68	25.00414	233.744
568064	102.756	25.0351	233.755

567098	102.725	25.02284	234.28
566423	102.712	25.04485	234.322
33164	102.724	25.02093	235.335
567515	102.746	25.08833	236.543
33075	102.76	25.07573	236.825
567457	102.706	25.04028	236.96
33070	102.731	25.05725	237.699
33186	102.691	25.03239	238.147
565981	102.68	25.01147	238.354
565857	102.682	25.01033	238.354
565448	102.723	25.00818	238.361
565638	102.721	25.01997	238.399
568179	102.688	25.05253	238.891
566472	102.686	25.05138	238.891
565832	102.709	25.03586	239.259
566342	102.697	25.04139	239.505
566483	102.709	25.05806	239.554
567232	102.711	25.05806	239.857
566451	102.71	25.06001	239.857
567138	102.719	25.03528	239.995
566262	102.711	25.0527	240.819
566631	102.746	25.04646	241.075
566535	102.734	25.0404	242.493
565368	102.689	25.05273	243.603
567443	102.746	25.05331	244.28
567260	102.748	25.05207	244.28
566655	102.727	25.06794	244.408
568174	102.717	25.02972	244.437
33155	102.738	25.0182	244.703
33116	102.751	25.07364	245.008
33117	102.734	25.0486	245.042
567081	102.74	25.04139	246.549
566645	102.739	25.04341	246.549
33100	102.727	25.06593	246.947
566673	102.732	25.06352	247.456
567003	102.694	25.04531	248.898
565669	102.696	25.04662	248.898
566298	102.708	25.02891	249.574
32777	102.706	25.03023	249.574
567002	102.746	25.02848	250.102
33159	102.748	25.02715	250.102
32841	102.719	25.02111	250.176
33067	102.707	25.0186	250.524
566648	102.712	25.06329	251.245
567076	102.723	25.03982	251.542
567744	102.72	25.03056	252.05
565523	102.719	25.02848	252.05
568114	102.734	25.0825	252.151
567191	102.727	25.0772	252.158
566717	102.725	25.07856	252.158
567526	102.713	24.99827	253.606
565964	102.711	24.99689	253.606
565728	102.732	25.00897	254.268
567646	102.752	25.03361	254.845
566309	102.708	25.03781	254.975
567467	102.721	25.09526	255.447

567422	102.719	25.09667	255.447
567469	102.735	25.0819	255.609
565755	102.733	25.02196	255.61
565749	102.735	25.02337	255.61
567498	102.714	25.06194	256.025
32789	102.728	25.00667	256.042
566442	102.714	25.04662	257.297
33094	102.716	25.04806	257.297
567116	102.706	25.02066	257.676
566082	102.705	25.01853	257.676
33192	102.709	24.98496	257.722
565773	102.733	24.99605	258.403
566716	102.717	25.05784	258.689
566416	102.685	25.05222	259.026
567875	102.708	25.0329	259.722
567111	102.709	25.03075	259.722
565745	102.721	25.02244	259.764
567139	102.744	25.02922	261.57
567072	102.693	25.04028	261.647
566393	102.691	25.03878	261.647
568061	102.745	25.03139	263.438
566259	102.701	25.04822	264.135
566768	102.741	25.07621	266.7
567109	102.702	25.02768	266.91
566678	102.713	25.05983	266.912
567342	102.751	25.08444	267.11
566289	102.714	25.04328	267.256
567709	102.733	25.02491	267.646
565440	102.731	25.02333	267.646
565906	102.688	25.03428	267.95
566895	102.74	25.03019	267.952
567238	102.748	25.04673	268.978
566993	102.747	25.04449	268.978
565830	102.712	25.03488	269.102
565562	102.721	25.00459	269.139
567073	102.689	25.05861	269.589
567063	102.691	25.057	269.589
568109	102.733	25.07525	270.001
32778	102.709	24.99853	271.965
566725	102.759	25.07765	272.018
566741	102.736	25.09703	272.742
565382	102.691	25.05485	273.544
33132	102.693	25.05319	273.544
565578	102.769	25.01036	273.596
567193	102.728	25.07907	274.136
565420	102.706	25.04153	274.312
32776	102.704	25.0432	274.312
32997	102.736	25.00639	274.961
566794	102.724	25.0721	275.174
566601	102.724	25.05235	275.813
565370	102.687	25.0493	275.818
566804	102.742	25.04308	275.826
566801	102.755	25.07842	275.857
566662	102.728	25.07489	276.209
565407	102.693	25.05614	276.215
566628	102.723	25.07573	277.245

567474	102.698	25.02108	277.985
33636	102.7	25.0228	277.985
566711	102.698	25.05638	278.022
568102	102.726	25.0475	278.877
566712	102.679	25.04369	278.881
566004	102.677	25.04196	278.881
567553	102.735	25.09854	279.313
567267	102.753	25.085	279.317
566459	102.684	25.04984	279.329
32881	102.685	25.0475	279.329
568850	102.734	25.00471	279.342
33566	102.733	25.00237	279.342
565457	102.738	25.01349	279.687
568116	102.725	25.08389	279.755
567328	102.739	25.08912	279.94
565593	102.734	25.00464	280.313
568118	102.737	25.09	280.368
565505	102.739	25.01585	280.376
566639	102.718	25.0557	280.564
33108	102.716	25.05395	280.564
567077	102.726	25.07035	280.622
567591	102.736	25.07486	281.295
566486	102.711	25.03744	281.409
568099	102.728	25.05093	281.577
566637	102.73	25.04917	281.577
567618	102.728	25.00144	281.869
565912	102.687	25.03651	282.292
566095	102.692	25.02851	282.771
566615	102.72	25.06447	283.51
568113	102.748	25.09116	283.89
567231	102.719	25.06508	285.042
566666	102.718	25.06268	285.042
566669	102.732	25.04735	285.491
567245	102.73	25.08245	285.557
566737	102.731	25.08485	285.557
567264	102.723	25.04131	285.882
566650	102.716	25.04661	285.888
566293	102.714	25.04479	285.888
566652	102.738	25.04766	288.486
567212	102.685	25.03828	288.592
565691	102.732	25.00657	289.107
567125	102.726	25.073	291.43
565721	102.731	25.01599	291.497
566363	102.761	25.06599	292.245
565757	102.715	25.02998	292.562
33133	102.693	25.04713	292.662
565677	102.784	25.00093	292.78
565445	102.727	25.0204	292.879
566280	102.709	25.05152	293.715
567291	102.749	25.08686	293.834
33114	102.742	25.07373	293.909
565828	102.713	25.03191	294.709
566963	102.754	25.03168	294.788
567470	102.734	25.08576	294.846
566757	102.735	25.08825	294.846
566944	102.735	25.03811	295.513

565804	102.737	25.04005	295.513
566065	102.712	25.02957	297.061
565681	102.758	24.99004	297.071
567135	102.727	25.04636	297.136
565559	102.721	24.98533	297.202
565558	102.723	24.98729	297.202
567315	102.738	25.00442	297.836
565877	102.703	25.02029	298.11
33184	102.702	25.02281	298.11
567865	102.678	25.00506	298.114
566865	102.69	25.03229	299.611
567694	102.69	25.02781	300.44
566005	102.686	25.01923	301.275
567492	102.698	25.03638	302.167
565436	102.736	25.03555	302.3
566260	102.698	25.0514	302.544
567041	102.763	25.06409	302.585
565455	102.76	25.06403	302.585
566003	102.681	25.04055	302.62
565868	102.678	25.0406	302.62
567355	102.743	25.01111	302.645
565608	102.73	25.0024	302.682
565894	102.708	24.98295	302.713
565865	102.711	24.98294	302.713
566671	102.743	25.04148	302.733
566742	102.749	25.05319	302.823
567099	102.74	25.01944	302.843
567409	102.688	25.05472	302.869
565994	102.687	25.03241	302.884
566965	102.775	25.03839	302.911
566081	102.69	24.9962	302.973
566399	102.688	25.05717	303.065
566597	102.724	25.04577	303.148
565720	102.735	24.9946	303.18
565780	102.74	25.01175	303.232
565774	102.737	25.01158	303.232
565463	102.742	25.01567	303.293
567204	102.677	25.00758	303.357
567524	102.68	25.00236	303.401
565482	102.73	25.02891	303.416
565732	102.761	24.98979	303.432
565607	102.74	25.01954	303.439
565461	102.743	25.01934	303.439
566668	102.714	25.05761	303.608
33112	102.734	25.08461	303.618
565729	102.719	25.02448	303.76
568066	102.744	25.01248	303.815
565393	102.714	24.9832	304.091
566614	102.723	25.0698	304.099
566605	102.722	25.03693	304.134
33077	102.719	25.03721	304.134
33078	102.757	25.07601	304.141
565965	102.683	25.02012	304.267
567303	102.769	24.98569	304.305
567510	102.714	24.99719	304.513
567415	102.745	25.07616	304.537

566682	102.716	25.04944	304.637
565951	102.693	25.03125	304.681
566764	102.75	25.07566	305.024
565682	102.76	25.00045	305.166
568864	102.687	25.04555	305.403
565369	102.689	25.04761	305.403
565360	102.748	25.00737	305.446
565850	102.678	25.01278	305.895
565526	102.736	25.02532	306.03
565976	102.732	25.05858	306.116
566028	102.685	25.02209	306.294
565861	102.688	25.02981	306.502
567286	102.68	25.01984	306.576
567693	102.751	25.02556	307.03
565489	102.752	25.02295	307.03
566058	102.696	25.03157	307.082
565903	102.699	25.0311	307.082
567010	102.756	25.02861	307.089
567205	102.68	25.00805	307.139
33162	102.757	24.97146	307.228
565634	102.73	25.02088	307.299
568176	102.74	25.0111	307.341
565905	102.69	25.03602	307.457
566610	102.721	25.06708	307.544
565595	102.763	25.00639	307.79
567481	102.694	24.99722	307.802
567199	102.684	25.02469	307.928
566772	102.75	25.07291	307.979
566735	102.753	25.07239	307.979
566684	102.732	25.04388	308.048
566651	102.729	25.0444	308.048
566799	102.742	25.07843	308.172
567025	102.716	25.03245	308.438
565971	102.679	25.01667	308.983
565622	102.735	25.00954	309.226
565430	102.782	25.00177	309.245
565636	102.719	25.03187	309.332
567889	102.754	25.0807	309.519
567347	102.757	25.08011	309.519
566006	102.678	25.04459	309.655
566370	102.697	25.0444	309.917
566986	102.759	25.02814	310.47
566981	102.757	25.02602	310.47
566681	102.719	25.07741	310.755
33110	102.731	25.0864	310.811
565438	102.774	24.98175	311.241
565496	102.73	24.99315	311.352
566627	102.725	25.06457	311.463
567413	102.693	24.99863	311.886
566068	102.696	24.99931	311.886
567295	102.687	25.01689	312.008
565914	102.685	25.01475	312.008
566316	102.722	24.98361	312.331
565627	102.725	24.98292	312.331
565550	102.701	25.03251	312.817
565403	102.723	24.98095	312.936

566686	102.718	25.05323	312.99
567882	102.731	25.02706	313.017
566608	102.73	25.0689	314.108
566751	102.76	25.04694	314.159
566740	102.729	25.06275	314.423
565563	102.75	25.00889	314.551
33157	102.753	25.00966	314.551
33235	102.745	24.96126	314.696
565042	102.735	25.04222	314.878
565926	102.703	25.02549	314.927
566749	102.734	25.0775	315.004
566718	102.731	25.07671	315.004
566394	102.696	25.0384	315.096
566392	102.693	25.03761	315.096
567110	102.691	25.02258	315.132
567257	102.738	25.04528	315.548
567134	102.734	25.04517	315.557
566083	102.691	25.01077	315.595
567505	102.762	25.07684	315.632
33134	102.71	25.04731	315.726
567310	102.739	25.00841	315.88
565974	102.71	25.01311	316.105
565801	102.723	25.00049	316.134
565630	102.726	24.99967	316.134
566719	102.737	25.07667	316.276
565594	102.761	25.00825	316.764
565980	102.688	25.02124	317.064
567202	102.733	25.09045	317.227
568181	102.683	25.05368	317.263
567459	102.724	25.08222	317.324
566758	102.727	25.08136	317.324
566641	102.75	25.06968	317.553
566607	102.729	25.05945	317.648
568100	102.745	25.06333	317.766
567658	102.744	25.06604	317.766
567622	102.734	25.07979	317.941
567190	102.731	25.07891	317.941
565631	102.72	24.99991	318.182
567885	102.733	25.06814	318.311
566629	102.736	25.06903	318.311
567087	102.732	25.05213	318.349
566112	102.729	25.05302	318.349
565810	102.777	24.99213	318.946
33629	102.692	24.995	319.219
567082	102.719	25.05898	319.39
566422	102.713	25.05487	319.471
566079	102.696	25.02158	319.62
565973	102.693	25.02066	319.62
565402	102.747	24.98997	319.828
565822	102.682	25.03012	320.178
565652	102.746	25.00999	320.208
565459	102.747	25.01272	320.208
567097	102.775	24.99556	320.366
568069	102.755	24.98361	320.689
567095	102.739	25.05618	320.713
565616	102.721	25.03411	320.736

566611	102.721	25.07306	320.813
566635	102.736	25.05523	320.854
565859	102.714	24.98579	321.013
565610	102.717	24.98675	321.013
567269	102.764	24.99736	321.268
565532	102.763	25.0001	321.268
567137	102.743	25.05619	321.579
565740	102.772	24.99462	321.743
565565	102.775	24.99364	321.743
33547	102.743	24.97851	322.31
566093	102.702	24.995	322.502
566226	102.733	25.05422	322.751
566057	102.694	25.05898	322.859
565598	102.697	25.05797	322.859
566616	102.726	25.05404	323.143
567149	102.681	24.99955	323.269
566496	102.707	25.0496	323.31
566263	102.71	25.04858	323.31
565479	102.738	25.03708	323.573
568119	102.751	25.06028	323.638
568183	102.704	25.04662	323.949
566327	102.707	25.04558	323.949
33074	102.761	25.07994	324.86
33120	102.721	25.0797	325.035
567323	102.763	24.96992	325.331
565736	102.76	24.97099	325.331
568178	102.68	25.05827	325.54
566067	102.702	25.03517	325.591
566225	102.757	25.0634	325.939
566224	102.754	25.06449	325.939
567542	102.78	24.97825	326.01
565768	102.766	25.00589	326.073
565486	102.769	25.0048	326.073
566638	102.735	25.04238	326.44
567888	102.753	25.06928	326.795
566654	102.751	25.06697	326.795
566765	102.748	25.07805	326.994
565618	102.728	25.02594	327.282
567224	102.687	25.01296	327.312
566080	102.682	25.01132	327.613
565986	102.683	25.00852	327.613
565371	102.694	25.04252	327.673
566793	102.716	25.06501	328.554
566344	102.685	25.05588	328.852
566636	102.736	25.05309	329.823
566761	102.746	25.055	330.264
566766	102.747	25.07411	330.671
566604	102.74	25.06162	330.877
568106	102.742	25.06201	331.2
566643	102.744	25.05965	331.2
566023	102.688	25.00276	331.61
566059	102.684	25.03119	331.671
33161	102.739	25.00108	331.855
33156	102.74	25.00392	331.855
567270	102.767	24.9983	331.973
567602	102.753	25.07601	332.335

567130	102.691	25.04101	332.569
565904	102.688	25.03977	332.569
33181	102.675	25.00996	333.02
565473	102.748	24.96125	333.209
567067	102.696	25.03577	333.511
566404	102.693	25.03451	333.511
565380	102.741	25.02796	333.526
567381	102.769	24.99274	333.608
566134	102.715	25.0419	333.638
567207	102.726	25.04313	333.962
566040	102.684	24.99853	333.978
565979	102.688	25.02337	334.481
565648	102.728	24.99528	334.806
565654	102.724	25.03103	335.031
567745	102.73	25.07374	335.036
566679	102.742	25.04471	335.34
565571	102.719	25.01253	335.46
565735	102.762	24.98757	335.703
565733	102.764	24.98998	335.703
566664	102.735	25.06573	335.893
33195	102.702	25.02837	336.306
566653	102.716	25.05108	336.341
566634	102.719	25.04976	336.341
33109	102.761	25.04314	336.404
568104	102.738	25.08306	336.514
565743	102.77	24.98802	336.627
566602	102.746	25.05753	337.305
566391	102.68	25.05234	337.314
566278	102.704	25.04825	337.817
565869	102.689	25.00859	337.904
565414	102.766	24.97087	338.218
565490	102.744	25.00821	338.328
565962	102.704	24.99281	338.375
565883	102.702	24.99037	338.375
565516	102.719	24.98908	338.444
566806	102.743	25.08971	339.076
566626	102.733	25.06149	339.272
566646	102.748	25.06559	339.277
566871	102.736	25.10088	339.708
565754	102.733	25.01738	340.346
565840	102.779	25.00424	340.633
565744	102.776	25.00284	340.633
565431	102.74	25.00689	341.048
566091	102.675	25.01318	341.41
565851	102.676	25.01611	341.41
566002	102.686	25.00994	341.441
566277	102.713	25.05252	341.603
567491	102.707	24.9864	342.526
565844	102.71	24.98784	342.526
565620	102.74	25.03436	342.947
565379	102.743	25.03291	342.947
566744	102.752	25.05733	343.208
567071	102.69	25.04427	343.451
568171	102.721	25.01574	343.51
33079	102.764	25.07934	343.676
565577	102.719	25.01994	343.731

565896	102.704	24.98241	343.767
566297	102.729	25.05612	343.95
567293	102.745	25.09264	344.139
566315	102.705	25.03625	344.596
565442	102.697	25.02861	344.598
566957	102.772	25.02147	344.634
566748	102.721	25.08073	345.069
565383	102.684	25.04779	346.109
565408	102.734	25.01446	347.267
566738	102.751	25.07917	347.347
567485	102.754	25.08734	347.459
565564	102.775	24.97399	348.297
567376	102.747	25.06812	348.525
565902	102.683	25.03643	348.784
33182	102.681	25.03387	348.784
565723	102.758	24.98266	349.196
565605	102.756	24.98522	349.196
566755	102.729	25.09068	350.005
33118	102.731	25.08811	350.005
566593	102.726	25.03823	350.541
567483	102.683	25.00255	350.616
565998	102.682	25.01405	350.988
567285	102.749	25.01732	350.993
565456	102.75	25.0143	350.993
567500	102.717	24.99468	350.998
565898	102.718	24.9977	350.998
568755	102.693	24.98306	351.001
33589	102.692	24.98608	351.001
567617	102.706	25.02632	351.886
567263	102.719	25.04209	352.116
33122	102.676	25.05218	352.209
567417	102.726	25.00926	352.452
566976	102.769	25.0224	352.802
565968	102.707	25.00328	352.887
565900	102.71	25.00165	352.887
565621	102.73	24.99768	352.899
567461	102.701	24.98132	352.987
33051	102.74	25.02501	353.013
566090	102.687	25.04281	353.12
565506	102.779	25.0012	353.232
565497	102.745	24.97966	353.756
565481	102.743	24.98227	353.756
567354	102.726	25.03216	354.19
565501	102.727	25.02911	354.19
567208	102.75	25.08222	354.566
566777	102.747	25.08056	354.566
567494	102.727	25.08389	354.795
565813	102.78	24.99046	355.221
567411	102.881	25.05111	356.326
565521	102.795	24.99083	357.16
567747	102.722	25.01133	357.944
566048	102.689	24.99328	358.159
566773	102.741	25.08173	358.575
566159	102.706	25.05979	358.621
566956	102.754	25.06	359.19
565950	102.697	25.02454	359.293

568059	102.748	24.98361	359.314
567298	102.682	25.01702	359.532
567531	102.711	24.99095	360.073
567290	102.77	25.10037	360.075
565560	102.733	25.02974	360.14
33172	102.724	25.01398	360.395
567497	102.727	25.00455	361.031
567598	102.74	25.08677	361.219
566362	102.755	25.06658	361.95
565396	102.732	25.03769	362.901
566941	102.742	24.96049	363.681
566754	102.732	25.0925	364.032
566756	102.741	25.09185	364.707
565551	102.722	24.99044	364.884
565658	102.76	24.96316	364.917
566864	102.711	25.02706	366.031
566432	102.715	25.03878	366.383
568020	102.696	25.01833	366.536
566647	102.726	25.05759	366.596
565955	102.706	25.02363	366.665
566660	102.718	25.07312	367.006
565975	102.704	25.01536	367.018
565817	102.735	25.0325	367.548
568054	102.759	24.99255	367.584
565999	102.694	25.02673	367.921
567313	102.738	25.08	369.084
565775	102.739	25.03338	369.156
565641	102.761	25.00364	369.162
565576	102.769	24.97903	369.292
565378	102.682	25.04501	369.398
33163	102.738	25.03018	370.227
565642	102.751	25.02908	370.985
566677	102.722	25.05223	371.261
566625	102.724	25.04943	371.261
565824	102.687	24.99608	371.311
33063	102.728	25.01793	371.782
567528	102.764	25.09667	371.883
33119	102.724	25.05031	372.291
565913	102.683	25.04179	372.367
567261	102.694	24.98722	373.937
566092	102.696	24.99005	373.937
566599	102.739	25.06927	374.052
33115	102.741	25.0721	374.052
568185	102.704	25.04762	374.323
567891	102.725	24.98583	374.97
565633	102.727	24.98867	374.97
565639	102.777	25.00708	375.047
565753	102.723	25.00299	375.591
565760	102.751	24.98535	375.721
565494	102.749	24.9882	375.721
566600	102.742	25.04783	375.968
567294	102.745	24.9625	376.472
566980	102.762	25.02931	376.659
566069	102.694	25.01239	376.662
566007	102.693	25.00913	376.662
566591	102.748	25.06131	377.134

33111	102.727	25.09178	377.416
33106	102.725	25.08891	377.416
565624	102.732	25.01159	377.86
565758	102.766	24.97713	379.778
565808	102.772	24.973	380.455
565674	102.769	24.97507	380.455
567488	102.745	24.95842	380.483
33562	102.727	25.08679	380.625
565592	102.746	25.00531	380.693
566644	102.737	25.06282	380.927
568122	102.81	25.03869	381.609
565640	102.758	25.00573	381.748
566031	102.69	25.01408	382.027
565705	102.783	24.99846	382.03
566612	102.73	25.04096	382.552
566732	102.757	25.05789	383.003
565756	102.746	24.98604	386.372
565508	102.772	24.99148	386.569
565719	102.724	25.01429	386.748
33194	102.713	25.01367	387.316
565572	102.718	24.98313	389.371
565805	102.774	25.00583	389.894
565354	102.695	25.06097	390.133
565841	102.704	24.98862	390.769
567007	102.77	25.02722	390.836
566974	102.767	25.025	390.836
566734	102.749	25.09179	391.06
567188	102.687	24.9833	391.49
565878	102.677	25.03738	392.06
565983	102.708	24.99086	392.1
567895	102.722	25.05806	393.841
566971	102.77	25.01896	396.002
565579	102.772	25.00891	397.539
567439	102.757	25.0477	397.695
566802	102.755	25.05078	397.695
566656	102.723	25.06148	398.836
567256	102.754	25.05556	398.858
566775	102.777	25.04042	399.013
566789	102.737	25.0725	399.222
565647	102.76	24.99776	399.329
565982	102.683	24.99567	400.06
565881	102.68	24.99802	400.06
567897	102.704	25.05668	400.474
567236	102.746	25.02611	400.595
567209	102.778	25.02444	401.032
566970	102.781	25.02208	401.032
565480	102.782	24.98055	402.472
566596	102.733	25.07245	403.364
566467	102.68	25.06004	403.386
565491	102.756	25.00042	403.571
565435	102.755	24.99419	403.579
565513	102.747	25.01923	403.681
566978	102.778	25.01629	403.806
565845	102.713	25.00266	403.809
565997	102.711	25.01878	403.973
567964	102.697	25.01694	404.081

566044	102.701	25.01675	404.081
567640	102.773	25.04018	404.31
566778	102.787	25.03998	404.449
565766	102.766	25.00183	404.511
565566	102.77	25.00208	404.511
565961	102.705	24.99633	404.626
565458	102.754	25.01457	404.629
566945	102.871	25.0472	404.693
565680	102.759	24.9942	404.868
565646	102.763	24.99391	404.868
565535	102.757	25.02015	405.263
565488	102.753	25.02049	405.263
567322	102.761	25.04958	405.608
566011	102.711	25.01664	405.7
565827	102.715	25.03603	406.468
565666	102.729	24.98248	406.577
565888	102.716	25.01123	406.654
565582	102.767	25.01202	406.756
565671	102.773	24.97654	406.786
565696	102.747	25.0413	406.947
566261	102.709	25.05438	407.126
565750	102.759	25.06022	407.415
565612	102.745	24.96667	407.798
567585	102.739	25.09949	407.987
565035	102.868	25.02639	408.191
565027	102.872	25.02694	408.191
565659	102.758	24.96504	408.392
565613	102.754	24.96448	408.392
33180	102.698	24.9878	408.697
565416	102.767	24.99489	408.922
566000	102.714	25.00803	409.393
566055	102.688	24.9867	409.462
567203	102.747	25.03906	410.107
565352	102.699	25.06164	410.235
568056	102.729	24.98516	410.46
565355	102.705	25.05367	410.945
565643	102.756	24.99704	411.45
565806	102.764	24.97409	411.459
565419	102.724	25.0172	411.603
567320	102.753	25.01806	411.713
565524	102.729	25.0141	411.899
567547	102.757	25.04389	411.942
567287	102.696	25.00667	412.066
567175	102.697	25.00308	412.066
565925	102.702	24.98491	412.287
565710	102.732	24.96735	412.367
565600	102.736	24.96811	412.367
567604	102.727	25.08563	412.378
565958	102.709	25.02318	412.638
567009	102.769	25.03306	412.804
566988	102.765	25.03384	412.804
565819	102.783	24.98405	413.246
567557	102.732	25.09597	414.197
566877	102.728	25.09512	414.197
566728	102.776	25.04389	414.411
33140	102.705	25.0524	415.165

567896	102.7	25.05466	415.573
567701	102.743	25.085	416.133
565759	102.774	25.00044	416.215
33238	102.77	24.99953	416.215
567023	102.777	25.01872	416.45
566972	102.774	25.01615	416.45
565492	102.726	24.99137	416.655
567159	102.686	25.00512	416.781
565415	102.731	25.03302	417.148
565531	102.733	25.001	417.574
566785	102.79	25.0544	418.008
566590	102.741	25.06598	418.094
565525	102.771	24.9824	418.16
565454	102.758	25.08773	418.393
33577	102.755	25.09033	418.393
565510	102.773	24.9867	418.972
566468	102.71	25.06299	419.824
566979	102.763	25.02605	420.065
565604	102.763	25.01156	420.091
565684	102.776	24.98941	420.115
567163	102.744	25.01534	420.454
566012	102.717	25.00566	420.754
567167	102.774	24.99843	421.569
566969	102.758	25.03616	423.266
565884	102.675	25.03436	423.44
565864	102.679	25.03321	423.44
565739	102.779	24.98485	423.729
565673	102.777	24.9815	423.729
565427	102.692	24.98387	424.217
565464	102.757	24.96133	425.147
567061	102.7	25.05302	425.241
565978	102.713	24.97657	425.445
33048	102.717	24.97778	425.445
565889	102.709	25.00537	426.221
565410	102.715	25.0187	426.453
566074	102.715	24.99039	429.13
565606	102.743	25.02337	429.421
567078	102.714	25.07369	429.838
33095	102.716	25.0771	429.838
567522	102.738	24.99444	430.183
565689	102.735	24.99719	430.183
565678	102.783	24.98883	430.509
565498	102.74	24.9795	432.111
568097	102.781	25.05361	433.102
565637	102.767	25.00968	433.795
565468	102.752	24.96269	434.346
565737	102.76	24.97677	435.13
566975	102.776	25.02295	435.826
566783	102.746	25.05021	436.755
565675	102.72	24.99393	437.786
565609	102.778	24.9965	439.131
565661	102.756	24.97531	440.3
566010	102.717	25.00279	440.898
566949	102.874	25.04782	440.97
566948	102.878	25.04942	440.97
565734	102.766	24.98597	441.156

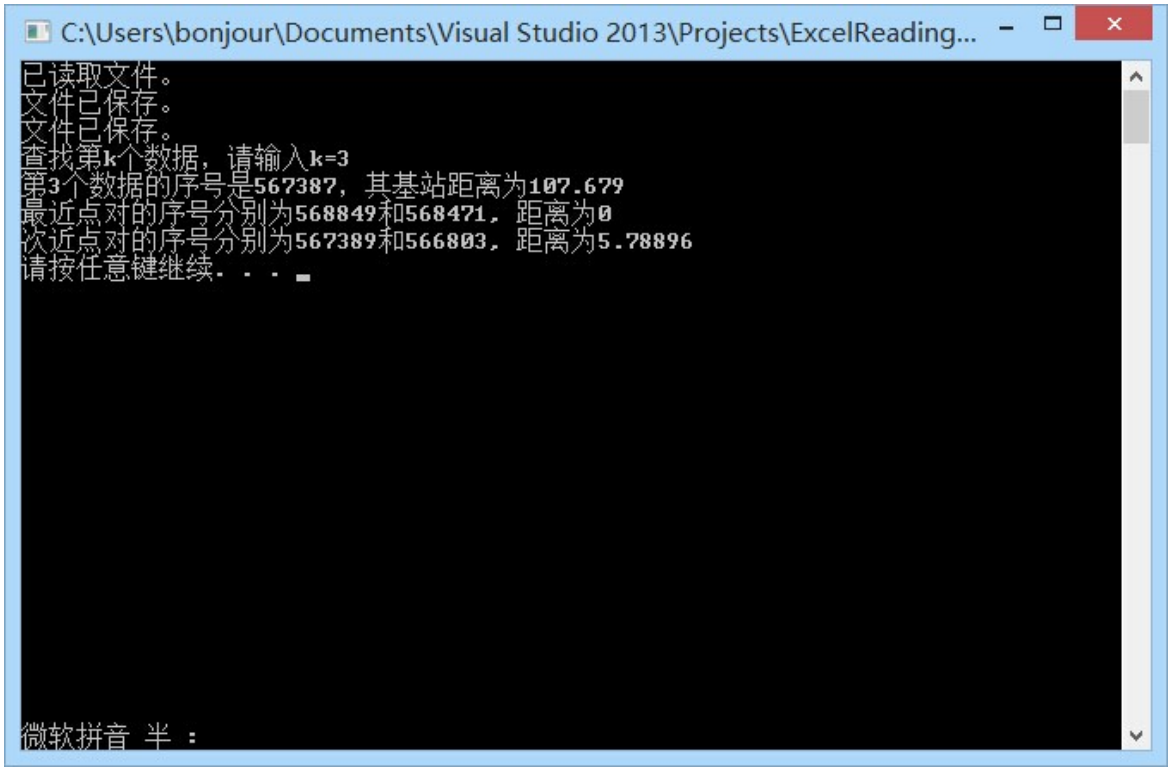
566412	102.705	25.06303	441.38
565334	102.701	25.06142	441.38
566750	102.751	25.04916	441.824
565724	102.715	25.02158	442.871
567094	102.722	25.05594	443.223
568098	102.754	25.05378	443.676
568027	102.746	24.97556	446.31
565668	102.732	24.98221	446.626
32775	102.684	25.06	446.98
566967	102.751	25.04082	448.388
567326	102.677	25.02028	449.365
567089	102.743	25.0384	449.817
567568	102.742	24.98778	450.815
565800	102.741	24.98383	450.815
33575	102.748	25.06329	451.678
567527	102.788	25.05583	453.568
567244	102.784	25.05397	453.568
566763	102.767	25.09286	454.328
565885	102.707	25.01229	456.488
565667	102.732	24.98664	457.652
565527	102.731	24.99065	457.652
566073	102.698	24.98295	458.811
33160	102.76	25.03218	461.012
566984	102.767	25.02933	461.131
565645	102.704	25.05773	463.071
565602	102.758	24.96724	463.88
566753	102.738	25.09538	463.903
565529	102.754	24.96711	464.81
565472	102.739	24.96919	465.08
565471	102.743	24.96711	465.08
565657	102.778	24.97742	465.258
567266	102.689	25.00074	466.714
567241	102.752	24.99916	467.504
567892	102.747	24.96994	467.693
566985	102.749	24.96615	467.693
567319	102.761	24.97945	468.322
567265	102.76	25.08333	469.267
565635	102.748	25.03577	469.607
566680	102.713	25.06824	469.887
565412	102.755	25.00454	469.928
565048	102.769	25.08944	471.047
566874	102.73	25.09895	471.623
565767	102.764	25.01528	472.531
568110	102.773	25.04715	472.652
565514	102.782	24.99426	474.278
567441	102.763	25.05667	475.755
567615	102.756	24.98925	475.995
567767	102.699	24.996	476.844
567183	102.739	24.96481	478.021
565512	102.727	24.97864	478.58
567157	102.808	25.0416	479.011
565350	102.764	25.05988	479.381
566999	102.756	25.04007	479.729
567292	102.746	25.09517	482.743
565722	102.715	25.02351	483.859
567353	102.681	25.0252	486.818

566321	102.679	25.02918	486.818
565381	102.678	25.04748	488.2
566720	102.764	25.04446	488.83
567465	102.754	25.01175	493.36
566982	102.761	25.02197	496.973
565835	102.685	24.99159	496.993
565478	102.787	24.98666	497.307
566987	102.763	25.03573	497.635
567027	102.787	25.02166	497.99
567173	102.696	25.00219	498.304
567220	102.793	25.00121	500.165
565397	102.796	24.99763	500.165
565487	102.758	25.00909	500.513
567546	102.778	25.04714	504.256
566787	102.785	25.09031	504.318
566943	102.782	25.01902	505.143
565509	102.753	24.98119	505.151
568101	102.767	25.09472	505.495
566779	102.768	25.03981	505.964
567299	102.758	25.06988	508.568
566947	102.884	25.05077	510.055
565726	102.754	24.9711	510.265
565424	102.766	24.98025	512.331
566745	102.769	25.04359	513.484
566013	102.704	24.97406	514.622
565765	102.734	24.97236	514.667
567248	102.719	24.97806	516.5
567596	102.792	24.98913	517.855
33545	102.787	24.99018	517.855
33073	102.786	25.09205	518.471
565676	102.74	24.95721	522.289
566996	102.872	25.05215	522.512
565561	102.74	24.99878	523.162
568065	102.865	25.02806	528.19
565537	102.768	24.96843	531.208
567008	102.772	25.03164	531.575
567574	102.772	25.09438	531.705
566072	102.709	24.9734	533.609
565520	102.782	25.0055	534.208
567600	102.867	25.04749	534.254
565584	102.798	24.99042	534.74
565522	102.795	24.99438	534.74
566747	102.765	25.0492	537.206
567626	102.784	25.05901	542.472
566759	102.761	25.09551	543.092
566726	102.763	25.09098	543.092
567601	102.704	24.97806	545.587
567357	102.709	24.97619	545.587
565664	102.729	24.9671	548.812
33234	102.759	25.01729	551.784
567580	102.675	24.99597	553.677
567336	102.87	25.03667	563.028
565030	102.868	25.03194	563.028
566066	102.695	24.97851	564.104
566026	102.699	24.97497	564.104
566781	102.782	25.04231	567.074

567011	102.785	25.02575	574.198
567184	102.739	24.9623	575.534
565665	102.752	24.95882	576.806
565031	102.868	25.04278	577.898
565764	102.736	24.9774	596.246
566557	102.772	25.09769	602.687
565596	102.728	24.97195	607.193
567715	102.804	25.03928	608.7
567075	102.75	24.97588	608.809
566977	102.883	25.05617	609.526
566795	102.778	25.05083	612.739
566743	102.772	25.04996	612.739
566731	102.767	25.0544	612.994
567506	102.704	24.97184	613.174
567537	102.798	25.04028	615.236
568121	102.792	25.05111	615.57
568115	102.796	25.05529	615.57
567619	102.736	24.97529	618.512
566946	102.889	25.05146	621.359
565585	102.801	24.99564	621.4
567021	102.881	25.04585	625.702
566049	102.702	25.01001	628.806
565466	102.746	24.9555	634.768
565046	102.78	25.09017	640.069
565433	102.749	24.9922	644.516
565045	102.783	25.09583	647.035
566983	102.777	25.03532	649.729
566767	102.755	25.0933	652.989
567194	102.874	25.02861	653.841
566770	102.768	25.10243	664.088
568117	102.802	25.05056	675.894
566730	102.8	25.04476	675.894
567893	102.873	25.05611	687.707
568075	102.875	25.03472	687.71
567157	102.812	25.03658	689.232
566997	102.775	24.97055	696.678
566784	102.791	25.03979	708.076
567222	102.791	25.03972	708.696
566038	102.686	24.98032	722.988
565547	102.791	25.00261	730.589
566022	102.676	24.99248	737.023
568209	102.879	25.02444	748.165
565028	102.872	25.02222	748.165

566989	102.782	25.01369	753.612
565037	102.882	25.03722	758.891
566992	102.86	25.04585	801.405
566991	102.854	25.04113	801.405
567530	102.787	25.06306	810.249
567489	102.886	25.04014	811.37
566968	102.887	25.06884	811.387
568072	102.851	25.03639	819.788
33248	102.77	25.07832	823.261
565029	102.874	25.06222	827.782
566966	102.82	25.03464	835.284
567718	102.891	25.0747	842.528
566821	102.895	25.06806	842.528
566960	102.89	25.05914	860.861
565034	102.866	25.06056	861.984
566762	102.746	25.10047	877.553
567016	102.79	25.01929	878.178
566018	102.772	25.0862	896.523
565036	102.859	25.034	896.784
565043	102.805	25.05161	914.185
33096	102.755	25.09944	914.484
566786	102.795	25.0895	950.703
567699	102.797	25.0146	1011.904
567741	102.823	25.03	1033.891
566776	102.794	25.08555	1050.747
564595	102.836	25.09583	1096.024
567258	102.805	25.08606	1110.463
33237	102.895	25.05019	1111.201
566942	102.843	25.03769	1173.66
568298	102.831	25.09944	1183.439
568297	102.828	25.08917	1183.439
566990	102.833	25.03204	1188.646
565033	102.88	25.07889	1322.606
565026	102.872	25.01466	1366.484
568068	102.804	25.02111	1426.698
565041	102.782	25.07667	1463.873
565044	102.803	25.0675	1531.77
565047	102.812	25.065	1649.266
564499	102.867	25.09281	2029.692
565025	102.895	25.095	2346.039
568313	102.863	25.09831	2735.798

三、　　线行时间查找和最近点对查找



- 源程序代码

```
#include <iostream>
#include <cmath>
#include <ctime> //用于生成随机数种子的 time 函数
#include "libxl.h" //用于读取 excel 文件

using namespace libxl; //用于读取 excel 文
件 using namespace std;

#define NUM 1033 //数据总数
#define RADIUM 6378137 //半径
const double PI = acos(-1.0); //常数 PI

struct baseData{ //定义基站数据的结构
    double enodebid; //编号
```

```
    double longitude,latitude; //精度和纬
    度 double k_dist; //基站距离
};

//数据和文件处理
int readData(Book* book, struct baseData data[]);
int saveData(Book* book, struct baseData data[], wchar_t
saveFileName[]);
int dataCopy(struct baseData data[], struct baseData data2[]);

//合并排序
void mergeSort(struct baseData data[], int mode);
void mergePass(struct baseData dataX[], struct baseData
dataY[], int s, int mode);
void merge(struct baseData dataC[], struct baseData dataD[],
int l, int m, int r, int mode);

//快速排序
void quickSort(struct baseData data[], int low, int high);
int patition(struct baseData data[], int low, int high);
double chooseOneFromThree(struct baseData data[], int low, int
high);
void insertSort(struct baseData data[], int low, int high);

//线性时间选择
struct baseData randomizedSelect(struct baseData data[], int p,
int r, int k);
int randomizedPartition(struct baseData data[], int low,
int high);
int chooseOneRandomly(struct baseData data[], int low, int
high);

//最近点对查找
void closest_pair(struct baseData data[], int n, struct
baseData
&a, struct baseData &b, double &distance);
void closest(struct baseData dataX[], struct baseData dataY[],
int low, int high, struct baseData &a, struct baseData &b,
double
&d);
double dist(struct baseData a, struct baseData b);

//次近点对查找
void secondClosestPair(struct baseData data[], int n,
struct baseData &c, struct baseData &d, double &distance,
struct baseData a, struct baseData b);


//main 函数
int main(void){
    //数据初始化
    Book* book = xlCreateBook();
    struct baseData data[1050];
```

```
    if (!book){
        cout << "Error when init book." << endl;
        return -1;
    }
    if (readData(book, data) <= 0)
        return -2;
    Book* bookSave = xlCreateBook();
    if (!bookSave){
        cout << "Error when init book." << endl;
        return -1;
    }

    //快速排序
    struct baseData dataSorted[1050];
    dataCopy(data, dataSorted);
    quickSort(dataSorted, 1, NUM);
    wchar_t saveSheetName[] = L"Sheet1"; //要保存的工作表名称为
    sheet1
    if (saveData(bookSave, dataSorted, saveSheetName) <= 0)
        return -3;

    //合并排序
    dataCopy(data, dataSorted);
    mergeSort(dataSorted, 3);
    saveSheetName[5]= L'2'; //要保存的工作表名称为 sheet2
    if (saveData(bookSave, dataSorted, saveSheetName) <= 0)
        return -3;

    //线性时间查找
    int k = 0;
    cout << "Please input the rank of data you want:";
    cin >> k;
    struct baseData temp = randomizedSelect(data, 1, NUM, k);
    cout << "The " << k << "th data is " << temp.enodebid <<
    ' '
<< temp.k_dist << endl;

    //最近点对查找
    dataCopy(data,
    dataSorted); struct
    baseData a, b; double
    distance;
    closest_pair(dataSorted, NUM, a, b, distance);
    cout << "The nearest data pair is " << a.enodebid << " and "
<< b.enodebid <<", the distance is "<< distance << endl;

    //次近点对查找
    struct baseData c, d;
    double distance2;
    secondClosestPair(data, NUM, c, d, distance2, a, b);
    cout << "The second nearest data pair is " << c.enodebid <<
" and " << d.enodebid << ", the distance is " << distance2 <<
endl;
```

```
    //保存所有工作表到 excel 文件
    中 bookSave->release();
    system("PAUSE");
    return 0;
}


//合并排序
void mergeSort(struct baseData data[], int mode){ //合并排序的总
函 数，将数组从大小为 1 开始进行合并
    struct baseData data2[1050];
    int s = 1;
    while (s < NUM){
        mergePass(data, data2, s, mode);//合并到 data2 中
        s += s;
        mergePass(data2, data, s, mode); //再合并回 data 中
        s += s;
    }
}

void mergePass(struct baseData dataX[], struct baseData
dataY[], int s, int mode){
    //将大小为 s 的相邻子数组合并
    int i = 1;
    while (i <= NUM - 2 * s){
        //合并大小为 s 的相邻两个子数组
        merge(dataX, dataY, i, i + s - 1, i + 2 * s - 1,
        mode); i = i + 2 * s;
    }
    if (i + s <= NUM)//如果剩下的元素少于 2s 个
        merge(dataX, dataY, i, i + s - 1, NUM,
    mode); else //如果剩下的元素少于 s 个
        for (int j = i; j <= NUM; j++)
            dataY[j] = dataX[j];
}

void merge(struct baseData dataC[], struct baseData dataD[],
int l, int m, int r, int mode){
    //将 c[l,m]和 c[m+1,r]合并到 d[l,r]
     int i = l, j = m + 1, k =
     l; while ((i <= m) && (j
               <= r))
        switch (mode){
            case 1:if (dataC[i].latitude < dataC[j].latitude)
                       dataD[k++] = dataC[i++];
                 else
                     dataD[k++] = dataC[j++];
               break;
            case 2:if (dataC[i].longitude < dataC[j].longitude)
                       dataD[k++] = dataC[i++];
                 else
```

```
                dataD[k++] = dataC[j++];
            break;
        case 3:if (dataC[i].k_dist < dataC[j].k_dist)
                dataD[k++] = dataC[i++];
            else
                dataD[k++] = dataC[j++];
            break;
    }
    if (i > m)
        for (int q = j; q <= r; q++)
            dataD[k++] = dataC[q];
    else
        for (int q = i; q <= m; q++)
            dataD[k++] = dataC[q];
}


//快速排序
void quickSort(struct baseData data[], int low, int high){ //快速 排序的总函数，将数组分区后分治排序
    if (low < high){ //长度大于 1
        if (high - low <= 20){ //当长度小于 20 时直接插入排序
            insertSort(data, low, high);
        }
        else{
            int pivotloc = patition(data, low, high); //将数据一分为二 quickSort(data, low, pivotloc - 1); //对前半部分进行排序 quickSort(data, pivotloc + 1, high); //对后半部分进行排序
        }
    }
}

int patition(struct baseData data[], int low, int high){ //将子表
（L.data[low]至 L.data[high]）按照数轴元素排序并返回枢轴元素的位置
    data[0] = data[low];
    double pivotKey = chooseOneFromThree(data, low, high); //将子表 的第一个记录、中间记录和最后一个记录三者的中值的作为枢轴记录
    while (low < high){ //从表的两端交替向中间扫描
        while (low < high && data[high].k_dist >= pivotKey) //将比枢 轴记录小的记录移到低端
            --high;
        data[low] = data[high];
        while (low < high && data[low].k_dist <= pivotKey) //将枢轴 记录大的记录移到高端
            ++low;
        data[high] = data[low];
    }
    data[low] = data[0]; //枢轴记录到
    位 return low;        //返回枢轴记
    录的位置
```

```
}

double chooseOneFromThree(struct baseData data[], int low, int
high){  //从 data[low]、data[high]和 data[（low+high）/2]中选择中值作
为  枢轴元素
   int middle = (low + high) / 2;
   if ((data[middle].k_dist > data[low].k_dist &&
data[middle].k_dist < data[high].k_dist) || (data[middle].k_dist>
data[high].k_dist && data[middle].k_dist <data[low].k_dist))
      return data[middle].k_dist;
   else if ((data[low].k_dist <= data[middle].k_dist &&
data[low].k_dist>data[high].k_dist) || (data[low].k_dist >=
data[middle].k_dist && data[low].k_dist < data[high].k_dist))
      return data[low].k_dist;
   else if ((data[high].k_dist <= data[middle].k_dist &&
data[high].k_dist> data[low].k_dist) || (data[high].k_dist <=
data[low].k_dist && data[high].k_dist > data[middle].k_dist))
      return data[high].k_dist;
}

void insertSort(struct baseData data[], int low, int high){ //插
入  排序，当快速排序的分区小于 20 时直接插入排序
   for (int i = low + 1; i <= high; i++)
      if (data[i].k_dist<data[i - 1].k_dist){ //当出现应当排在前面
      的
记录时
         double temp = data[i].k_dist;
         struct baseData tempData =
         data[i]; int j;
         for (j = i - 1; j >= low&&data[j].k_dist>temp; j--) //
记录后移     将

            data[j + 1] = data[j];
      }  data[j + 1] = tempData;
}


//线性时间选择
struct baseData randomizedSelect(struct baseData data[], int p,
int r, int k){ //线性时间选择的总函数，对数组按照枢轴元素分区后分治处理
   if (p == r)return data[p]; //当只有一个元素时直接返回
   int i = randomizedPartition(data, p, r), j = i - p + 1; //
对 data[p]到 data[r]按照随机生成的枢轴元素进行排序，然后返回枢轴元素位置
   if (k <= j)return randomizedSelect(data, p, i, k); //按照枢轴
元  素进行分治
   else return randomizedSelect(data, i + 1, r, k - j);
}

int randomizedPartition(struct baseData data[], int low, int
high){  //按照随机生成的数轴元素进行排序后返回枢轴元素的位置
```

```
    int pivot = chooseOneRandomly(data, low, high); //随机生成数轴
    元素
    data[0] = data[pivot];
    data[pivot] = data[low];
    data[low] = data[0];
    double pivotKey = data[0].k_dist;
    while (low < high){ //从表的两端交替向中间扫描
        while (low < high && data[high].k_dist >= pivotKey) //将比
        枢轴记录小的记录移到低端
            --high;
        data[low] = data[high];
        while (low < high && data[low].k_dist <= pivotKey) //将枢
轴记录大的记录移到高端
            ++low;
        data[high] = data[low];
    }
    data[low] = data[0]; //枢轴记录位
    return low; //返回枢轴记录的位置
}

int chooseOneRandomly(struct baseData data[], int low, int
high){ //随机生成枢轴元素
    srand((unsigned)time(NULL));
    int temp = rand();
    temp = low + temp%(high - low);
    return temp;
}


//最近点对
void closest_pair(struct baseData data[], int n, struct
baseData
&a, struct baseData &b, double &distance){
    //最近点对的总函数，对复制后的数据分别按照经度和纬度进行排序后调用
closest 函数
    struct baseData dataXSorted[1050], dataYSorted[1050];
    dataCopy(data, dataXSorted);
    dataCopy(data, dataYSorted);
    mergeSort(dataXSorted, 1); //按照经度排序
    mergeSort(dataYSorted, 2); //按照纬度排序
    closest(dataXSorted, dataYSorted, 1, n, a, b, distance);
///调用 closest 函数
}

void closest(struct baseData dataX[], struct baseData dataY[],
int low, int high, struct baseData &a, struct baseData &b,
double
&d){
    //核心函数，具体计算最近点对
    int i, j, k, m;
    struct baseData aLeft, bLeft, aRight, bRight;
```

```
    double dLeft, dRight;

    if ((high - low) == 1){ //当 n=2 时直接计算
        a = dataX[low], b = dataX[high], d = dist(dataX[low],
dataX[high]);
    }

    else{
        if ((high - low) == 2){ //当 n=3 时直接计算
            dLeft = dist(dataX[low], dataX[low + 1]);
            dRight = dist(dataX[low], dataX[low +
            2]); d = dist(dataX[low + 1], dataX[low
            + 2]); if ((dLeft <= dRight) && (dLeft
            <= d)){
                a = dataX[low];
                b = dataX[low + 1];
                d = dLeft;
            }
            else{
                if (dRight <=
                    d){ a =
                    dataX[low];
                    b = dataX[low + 2];
                    d = dRight;
                }
                else{
                    a = dataX[low + 1];
                    b = dataX[low + 2];
                }
            }
        }

        else{ //当 n>3 时进行分治
            struct baseData * SL = new struct baseData[NUM];
            struct baseData * SR = new struct baseData[NUM];

            m = low + (high - low) / 2; //把 x 数组以 m 为界划分为
            两半 j = k = 1;
            for (i = 1; i <= high - low + 1; i++){
                if (dataY[i].latitude <=
                    dataX[m].latitude){ SL[j++] = dataY[i];
                                        //收集左边子集中的最近点
                    对
                }
                else{
                    SR[k++] = dataY[i]; //收集右边子集中的最近点对
                }
            }

            closest(dataX, SL, low, m, aLeft, bLeft, dLeft); //计
算左边子集的最近点对
            closest(dataX, SR, m + 1, high, aRight, bRight,
dRight); //计算右边子集的最近点对
```

```
            if (dLeft < dRight) { //比较后得到左右子集中点的最短
                距离 a = aLeft, b = bLeft, d = dLeft;
            }
            else{
                a = aRight, b = bRight, d = dRight;
            }

            struct baseData *dataTemp = new struct baseData[high -
low + 1];
            k = 0;
            for (i = 1; i <= high - low + 1; i++){
            //收集距离中线距离
小于 d 的元素，保存到数组 Z（因 Y 数组按 y 坐标递增排序，Z 数组也一样）
                if (fabs(dataX[m].latitude - dataY[i].latitude) < d)
{
                    dataTemp[k++]=dataY[i];
                }
            }
            for (i = 0; i < k; i++){
                for (j = i + 1; (j < k) && (dataTemp[j].longitude
- dataTemp[i].longitude < d); j++){ //若前后两点 y 轴的距离超过 d 则
不可能使距离小于 d，退出
                    dLeft = dist(dataTemp[i], dataTemp[j]); //计算前
                    后两点的距离
                    if (dLeft < d) { //若小于 d，则更新
                        a = dataTemp[i], b = dataTemp[j], d = dLeft;
                    }
                }
            }

            delete SL;
            delete SR;
            delete  dataTemp;
        }
    }
}

double dist(struct baseData a, struct baseData b){ //已知经度和
纬度 求距离
    return RADIUM*acos(cos(a.latitude*PI /
    180)*cos(b.latitude*PI
/ 180)*cos(a.longitude*PI / 180 - b.longitude*PI / 180) +
sin(a.latitude*PI / 180)*sin(b.latitude*PI / 180));
}


//次最近点对查找
void secondClosestPair(struct baseData data[], int n,
struct baseData &c, struct baseData &d, double &distance,
struct baseData a, struct baseData b){
    //对不含 a 和 b 的点集求最近点对，再分别求 a 和 b 与这些点的距离，最小值即
为次近 点对
```

```
    struct baseData data2[NUM];
    int i, k;
    for (i = 1, k = 1; i <= NUM; i++){ //复制得到一份不含最近点对 a 和
    b
的数据
        if (data[i].enodebid != a.enodebid && data[i].enodebid !=
b.enodebid){
            data2[k++] = data[i];
        }
    }
    closest_pair(data2, NUM - 2, c, d, distance); //对该数据求最
近点对和最近距离 distance
    for (i = 1; i <= NUM - 2; i++){ //如果 a 或者 b 与其他点的距离小于
distance，则更新 distance
        if (dist(data2[i], a) <
            distance){ c = data[i];
            d = a;
        }
        else if (dist(data2[i], b) <
            distance){ c = data[i];
            d = b;
        }
    }
}


//数据与文件处理
int readData(Book* book, struct baseData data[]){ //将数据从
excel 文件中读出
    wchar_t loadFileName[] = L"1033 个基站数据.xls";
    if (book->load(loadFileName)){ //读取 book
        cout << "File Loaded." << endl;
    }
    else{
        cout << "Error when load file." << endl;
        return -2;
    }
    Sheet* sheet = book->getSheet(0);
    if (sheet){ //将 sheet 中的数据复制到结构数组中
        cout << sheet->readNum(4, 1) << endl;
        for (int i = 1; i <= NUM; i++){
            data[i].enodebid = (int)sheet->readNum(i, 0);
            data[i].longitude = sheet->readNum(i, 1);
            data[i].latitude = sheet->readNum(i, 2);
            data[i].k_dist = sheet->readNum(i, 3);
        }
    }
    book->release();
}

int saveData(Book* bookSave, struct baseData data[], wchar_t
```

```
saveSheetName[]){ //将数据保存至新的 excel 文件中
    Sheet* sheet2 = bookSave->addSheet(saveSheetName);
    if (sheet2){ //将结构数组中的数组保存到 sheet 中
        sheet2->writeStr(0, 0, L"enodebid");
        sheet2->writeStr(0, 1, L"longitude");
        sheet2->writeStr(0, 2, L"latitude");
        sheet2->writeStr(0, 3, L"k_dist");
        for (int i = 1; i <= NUM; i++){
            sheet2->writeNum(i, 0, data[i].enodebid);
            sheet2->writeNum(i, 1, data[i].longitude);
            sheet2->writeNum(i, 2, data[i].latitude);
            sheet2->writeNum(i, 3, data[i].k_dist);
        }
    }
    if (bookSave->save(L"result.xls"))
        cout << "Write Successful." << endl;
    else{
        cout << "Error in writing." << endl;
        return -3;
    }
}

int dataCopy(struct baseData data[], struct baseData
data2[]){ //将数据拷贝到新的结构数组中（在新的结构数组中进行排序等修改）
    for (int i = 1; i <= NUM; i++)
        data2[i] = data[i];
    return 0;
}
```