

LAMPIRAN-LAMPIRAN

LAMPIRAN 1 : Data lahan Rawa Pening dan Kota Salatiga

Tabel 1. Data Rawa Pening

No.	Garis Lintang	Garis Bujur	No.	Garis Lintang	Garis Bujur
1	-7.288313	110.434706	210	-7.300096	110.453809
2	-7.282969	110.407866	211	-7.300195	110.454073
3	-7.282695	110.408088	212	-7.300492	110.454275
4	-7.282282	110.408381	213	-7.300787	110.454403
5	-7.282005	110.408520	214	-7.301080	110.454531
6	-7.281446	110.408886	215	-7.301371	110.454657
7	-7.281024	110.409097	216	-7.301564	110.454814
8	-7.280883	110.409431	217	-7.301756	110.455043
9	-7.280741	110.409766	218	-7.301947	110.455198
10	-7.280599	110.410101	219	-7.302137	110.455425
11	-7.280314	110.410422	220	-7.305534	110.456408
12	-7.280027	110.410744	221	-7.284592	110.407658
13	-7.279739	110.410980	222	-7.284994	110.407798
14	-7.279450	110.411305	223	-7.285262	110.408174
15	-7.279013	110.411618	224	-7.285793	110.408666
16	-7.279013	110.411974	225	-7.285793	110.409003
17	-7.278720	110.412304	226	-7.286055	110.409372
18	-7.278427	110.412635	227	-7.286446	110.409672
19	-7.278429	110.412815	228	-7.286826	110.410052
20	-7.278141	110.413419	229	-7.287212	110.410347
21	-7.278145	110.413689	230	-7.287589	110.410557
22	-7.278146	110.414318	231	-7.287834	110.410832

23	-7.277848	110.414565	232	-7.288323	110.411215
24	-7.277843	110.414925	233	-7.288564	110.411488
25	-7.277839	110.415284	234	-7.288926	110.411771
26	-7.277538	110.415625	235	-7.289285	110.412135
27	-7.277533	110.415986	236	-7.289769	110.412509
28	-7.277380	110.416337	237	-7.290015	110.412858
29	-7.276778	110.416575	238	-7.290383	110.413218
30	-7.276169	110.416906	239	-7.290860	110.413423
31	-7.275557	110.417057	240	-7.291210	110.413696
32	-7.275245	110.417317	241	-7.291686	110.413899
33	-7.274622	110.417563	242	-7.292038	110.414169
34	-7.274150	110.417819	243	-7.292511	110.414289
35	-7.273989	110.418090	244	-7.293082	110.414338
36	-7.273826	110.418548	245	-7.293648	110.414465
37	-7.273663	110.418914	246	-7.294096	110.414503
38	-7.273341	110.419276	247	-7.294541	110.414541
39	-7.273177	110.419645	248	-7.294981	110.414500
40	-7.272852	110.420010	249	-7.295415	110.414460
41	-7.272366	110.420373	250	-7.295954	110.414506
42	-7.271878	110.420644	251	-7.296490	110.414553
43	-7.271547	110.421016	252	-7.297025	110.414599
44	-7.271217	110.421294	253	-7.297345	110.414400
45	-7.271052	110.421767	254	-7.297662	110.414278
46	-7.270886	110.422145	255	-7.297978	110.414156
47	-7.270555	110.422524	256	-7.298393	110.414044
48	-7.270388	110.422905	257	-7.298804	110.414083

49	-7.270388	110.423287	258	-7.299110	110.414334
50	-7.270054	110.423669	259	-7.299413	110.414584
51	-7.269381	110.423670	260	-7.299513	110.414889
52	-7.268700	110.423865	261	-7.299817	110.415211
53	-7.268357	110.424254	262	-7.300021	110.415449
54	-7.267840	110.424647	263	-7.300120	110.415751
55	-7.267492	110.424943	264	-7.300219	110.416053
56	-7.267492	110.425334	265	-7.300114	110.416339
57	-7.267491	110.425725	266	-7.300009	110.416626
58	-7.267317	110.426119	267	-7.300008	110.416920
59	-7.267316	110.426510	268	-7.300006	110.417288
60	-7.266790	110.426915	269	-7.300205	110.417595
61	-7.266260	110.427421	270	-7.300506	110.417833
62	-7.265726	110.427734	271	-7.300707	110.418064
63	-7.265367	110.428142	272	-7.301003	110.418299
64	-7.264826	110.428460	273	-7.301284	110.418604
65	-7.264644	110.428866	274	-7.301572	110.418836
66	-7.264279	110.429280	275	-7.301764	110.419134
67	-7.263913	110.429697	276	-7.301860	110.419355
68	-7.263545	110.430016	277	-7.302146	110.419656
69	-7.263001	110.430344	278	-7.302526	110.419814
70	-7.262637	110.430767	279	-7.302715	110.420108
71	-7.262639	110.431273	280	-7.302902	110.420401
72	-7.261730	110.431324	281	-7.303276	110.420555
73	-7.261556	110.431741	282	-7.303555	110.420777
74	-7.261558	110.432251	283	-7.303831	110.420997

75	-7.261735	110.432648	284	-7.304015	110.421214
76	-7.261737	110.433157	285	-7.304380	110.421434
77	-7.261913	110.433552	286	-7.304562	110.421649
78	-7.262281	110.433932	287	-7.304923	110.421866
79	-7.262651	110.434309	288	-7.305281	110.421942
80	-7.263019	110.434684	289	-7.305672	110.422018
81	-7.263210	110.435172	290	-7.306118	110.422025
82	-7.263579	110.435543	291	-7.306560	110.422032
83	-7.263767	110.435928	292	-7.306908	110.422106
84	-7.263774	110.436328	293	-7.307254	110.422180
85	-7.263961	110.436712	294	-7.307594	110.422320
86	-7.264334	110.437075	295	-7.307759	110.422526
87	-7.264527	110.437454	296	-7.308093	110.422733
88	-7.264903	110.437813	297	-7.308253	110.423004
89	-7.265093	110.438090	298	-7.308504	110.423073
90	-7.265287	110.438565	299	-7.308745	110.423410
91	-7.265297	110.438960	300	-7.308990	110.423611
92	-7.265307	110.439355	301	-7.309240	110.423878
93	-7.265317	110.439750	302	-7.309324	110.424145
94	-7.265327	110.440145	303	-7.309408	110.424411
95	-7.265330	110.440640	304	-7.309408	110.424678
96	-7.265332	110.441036	305	-7.309409	110.424945
97	-7.265510	110.441410	306	-7.309327	110.425214
98	-7.265513	110.441905	307	-7.309162	110.425484
99	-7.265515	110.442300	308	-7.308913	110.425758
100	-7.265518	110.442795	309	-7.308746	110.425964

101	-7.265695	110.443165	310	-7.308578	110.426238
102	-7.266046	110.443509	311	-7.308579	110.426508
103	-7.266396	110.443851	312	-7.308496	110.426780
104	-7.266398	110.444245	313	-7.308327	110.427056
105	-7.266573	110.444709	314	-7.308243	110.427330
106	-7.266922	110.445046	315	-7.308159	110.427604
107	-7.267101	110.445408	316	-7.308075	110.427879
108	-7.267101	110.445800	317	-7.307905	110.428158
109	-7.267097	110.446193	318	-7.307906	110.428497
110	-7.267094	110.446487	319	-7.307907	110.428701
111	-7.267086	110.446979	320	-7.307908	110.429040
112	-7.267077	110.447374	321	-7.307907	110.429379
113	-7.266894	110.447800	322	-7.307906	110.429651
114	-7.266536	110.448259	323	-7.307906	110.429922
115	-7.266175	110.448721	324	-7.308074	110.430181
116	-7.265813	110.449185	325	-7.308158	110.430446
117	-7.265277	110.449486	326	-7.308241	110.430710
118	-7.264558	110.449723	327	-7.308408	110.430967
119	-7.263830	110.450064	328	-7.308490	110.431230
120	-7.263275	110.450475	329	-7.308738	110.431478
121	-7.262899	110.450852	330	-7.308985	110.431725
122	-7.263445	110.450946	331	-7.308983	110.431993
123	-7.264353	110.450765	332	-7.308981	110.432329
124	-7.265249	110.450587	333	-7.308980	110.432598
125	-7.265958	110.450446	334	-7.309060	110.432992
126	-7.267007	110.450237	335	-7.309141	110.433251

127	-7.267700	110.450001	336	-7.309303	110.433501
128	-7.268385	110.449767	337	-7.309630	110.433599
129	-7.269064	110.449536	338	-7.310035	110.433553
130	-7.269734	110.449404	339	-7.310358	110.433318
131	-7.270396	110.449274	340	-7.310519	110.433103
132	-7.271054	110.449239	341	-7.310759	110.432814
133	-7.271711	110.449297	342	-7.310997	110.432789
134	-7.272524	110.449416	343	-7.311074	110.433043
135	-7.273184	110.449466	344	-7.311231	110.433222
136	-7.273680	110.449548	345	-7.311229	110.433550
137	-7.274162	110.449633	346	-7.311306	110.433737
138	-7.274490	110.449933	347	-7.311306	110.434064
139	-7.274505	110.450390	348	-7.311305	110.434326
140	-7.274519	110.450847	349	-7.311305	110.434587
141	-7.274534	110.451304	350	-7.311069	110.434879
142	-7.274703	110.451634	351	-7.310910	110.435162
143	-7.275180	110.451801	352	-7.310672	110.435391
144	-7.275502	110.452092	353	-7.310513	110.435676
145	-7.275822	110.452383	354	-7.310273	110.435907
146	-7.276444	110.452509	355	-7.310031	110.436206
147	-7.276756	110.452707	356	-7.309786	110.436440
148	-7.277218	110.452867	357	-7.309624	110.436730
149	-7.277825	110.452989	358	-7.309379	110.436900
150	-7.278275	110.453059	359	-7.309051	110.437149
151	-7.278838	110.453194	360	-7.309051	110.437484
152	-7.279254	110.453363	361	-7.309298	110.437647

153	-7.279806	110.453496	362	-7.309461	110.437821
154	-7.280078	110.453785	363	-7.309543	110.438075
155	-7.280487	110.453949	364	-7.309543	110.438342
156	-7.280898	110.454023	365	-7.309543	110.438608
157	-7.281457	110.454142	366	-7.309625	110.438861
158	-7.281735	110.454332	367	-7.309625	110.439127
159	-7.282149	110.454572	368	-7.309788	110.439365
160	-7.282424	110.454846	369	-7.309788	110.439631
161	-7.282833	110.454996	370	-7.309788	110.439897
162	-7.283374	110.455109	371	-7.309788	110.440162
163	-7.283910	110.455222	372	-7.309625	110.440459
164	-7.284444	110.455246	373	-7.309299	110.440520
165	-7.284841	110.455476	374	-7.308970	110.440582
166	-7.285236	110.455620	375	-7.308638	110.440577
167	-7.285757	110.455559	376	-7.308304	110.440505
168	-7.286274	110.455582	377	-7.307884	110.440583
169	-7.286786	110.455521	378	-7.307544	110.440578
170	-7.287296	110.455459	379	-7.307116	110.440657
171	-7.287803	110.455314	380	-7.306771	110.440790
172	-7.288304	110.455171	381	-7.306511	110.441045
173	-7.288796	110.454868	382	-7.306073	110.441266
174	-7.289162	110.454684	383	-7.305897	110.441577
175	-7.289890	110.454480	384	-7.305720	110.441819
176	-7.290371	110.454506	385	-7.305720	110.442167
177	-7.290848	110.454451	386	-7.305631	110.442463
178	-7.291555	110.454250	387	-7.305452	110.442777

179	-7.292021	110.454038	388	-7.305093	110.442711
180	-7.292368	110.453702	389	-7.304643	110.442803
181	-7.292827	110.453337	390	-7.304462	110.443050
182	-7.293055	110.453037	391	-7.304280	110.443370
183	-7.293169	110.452769	392	-7.304189	110.443671
184	-7.293395	110.452314	393	-7.304189	110.444024
185	-7.293622	110.451939	394	-7.304006	110.444346
186	-7.293737	110.451594	395	-7.303914	110.444650
187	-7.294077	110.451191	396	-7.303639	110.444994
188	-7.294299	110.450822	397	-7.303548	110.445298
189	-7.294745	110.450550	398	-7.303451	110.445605
190	-7.295298	110.450407	399	-7.303361	110.445910
191	-7.295736	110.450370	400	-7.303364	110.446194
192	-7.296171	110.450334	401	-7.303364	110.446479
193	-7.296278	110.450536	402	-7.303364	110.446763
194	-7.296492	110.450785	403	-7.303364	110.447119
195	-7.296598	110.451062	404	-7.303364	110.447404
196	-7.296811	110.451309	405	-7.303457	110.447666
197	-7.296809	110.451690	406	-7.303550	110.447927
198	-7.296914	110.451965	407	-7.303550	110.448211
199	-7.297126	110.452210	408	-7.303642	110.448543
200	-7.297548	110.452242	409	-7.303734	110.448802
201	-7.297965	110.452200	410	-7.303827	110.449061
202	-7.298275	110.452263	411	-7.303828	110.449344
203	-7.298480	110.452429	412	-7.304013	110.449577
204	-7.298685	110.452669	413	-7.304379	110.449689

205	-7.298787	110.452938	414	-7.304469	110.449946
206	-7.299092	110.453073	415	-7.304558	110.450203
207	-7.299193	110.453414	416	-7.304738	110.450433
208	-7.299395	110.453651	417	-7.305008	110.450567
209	-7.299697	110.453782	418	-7.305187	110.450796

Tabel 2. Data Kota Salatiga

No.	Garis Lintang	Garis Bujur	No.	Garis Lintang	Garis Bujur
1	-7.341269	110.498300	185	-7.349398	110.533165
2	-7.347365	110.474469	186	-7.350437	110.533576
3	-7.346882	110.473649	187	-7.351209	110.534015
4	-7.346583	110.472888	188	-7.352233	110.534244
5	-7.345963	110.472258	189	-7.352746	110.533655
6	-7.345024	110.471395	190	-7.352496	110.532983
7	-7.344399	110.470575	191	-7.352500	110.532281
8	-7.342781	110.470325	192	-7.353264	110.531844
9	-7.341476	110.469940	193	-7.353767	110.532312
10	-7.339695	110.469685	194	-7.353763	110.533011
11	-7.338580	110.469536	195	-7.353253	110.533770
12	-7.337054	110.469505	196	-7.354007	110.534203
13	-7.335621	110.470820	197	-7.355009	110.534255
14	-7.335056	110.471504	198	-7.356003	110.534306
15	-7.333838	110.471914	199	-7.356990	110.534185
16	-7.332913	110.472176	200	-7.357969	110.533892
17	-7.330366	110.472232	201	-7.358943	110.533260
18	-7.329113	110.472269	202	-7.359903	110.533485

19	-7.327844	110.472111	203	-7.360860	110.533030
20	-7.326563	110.471952	204	-7.360864	110.532351
21	-7.325273	110.471989	205	-7.360630	110.531700
22	-7.324307	110.472461	206	-7.360633	110.531191
23	-7.322999	110.472699	207	-7.360639	110.530003
24	-7.321036	110.474061	208	-7.360643	110.529324
25	-7.319696	110.474310	209	-7.361122	110.528596
26	-7.318710	110.474805	210	-7.362303	110.528308
27	-7.317413	110.475273	211	-7.363239	110.528046
28	-7.316084	110.475540	212	-7.363706	110.527497
29	-7.314710	110.474988	213	-7.363478	110.526849
30	-7.312999	110.475218	214	-7.363016	110.526221
31	-7.311968	110.475317	215	-7.363019	110.525550
32	-7.311615	110.474662	216	-7.363022	110.525046
33	-7.311598	110.473835	217	-7.362987	110.524045
34	-7.310219	110.473066	218	-7.362987	110.522870
35	-7.309888	110.473653	219	-7.363006	110.522028
36	-7.309905	110.474485	220	-7.363022	110.521186
37	-7.309578	110.475282	221	-7.363267	110.520498
38	-7.308879	110.474795	222	-7.363279	110.519658
39	-7.308171	110.474097	223	-7.363290	110.518819
40	-7.307455	110.473185	224	-7.363299	110.518147
41	-7.306736	110.472268	225	-7.363311	110.517308
42	-7.305665	110.471519	226	-7.363083	110.516649
43	-7.304241	110.471359	227	-7.362618	110.516001
44	-7.303087	110.470587	228	-7.363567	110.515787

45	-7.301554	110.470192	229	-7.364266	110.516254
46	-7.299992	110.469575	230	-7.365197	110.516373
47	-7.299646	110.470181	231	-7.366120	110.516491
48	-7.298911	110.470743	232	-7.366587	110.515971
49	-7.298186	110.471525	233	-7.367054	110.515289
50	-7.297767	110.471044	234	-7.367960	110.515575
51	-7.297320	110.470123	235	-7.368861	110.515695
52	-7.297251	110.469028	236	-7.369310	110.515673
53	-7.296080	110.469104	237	-7.371746	110.515715
54	-7.295739	110.469938	238	-7.372836	110.515660
55	-7.295430	110.470779	239	-7.374131	110.515596
56	-7.294786	110.471589	240	-7.374984	110.515553
57	-7.293790	110.472149	241	-7.375827	110.515670
58	-7.293510	110.473003	242	-7.376695	110.515940
59	-7.292877	110.473825	243	-7.377368	110.516059
60	-7.292596	110.474681	244	-7.378232	110.516325
61	-7.292667	110.475570	245	-7.379023	110.515972
62	-7.292738	110.476459	246	-7.379256	110.515023
63	-7.292544	110.477330	247	-7.379198	110.514250
64	-7.292135	110.478194	248	-7.379177	110.513629
65	-7.291287	110.478579	249	-7.379186	110.513004
66	-7.290397	110.479182	250	-7.379193	110.512380
67	-7.289405	110.479994	251	-7.379812	110.511736
68	-7.289409	110.480658	252	-7.380619	110.512019
69	-7.288044	110.481653	253	-7.381223	110.511998
70	-7.288163	110.482555	254	-7.382420	110.512111

71	-7.287502	110.483386	255	-7.382833	110.512555
72	-7.286751	110.484211	256	-7.383026	110.513160
73	-7.286585	110.485087	257	-7.383405	110.513757
74	-7.287040	110.486009	258	-7.383384	110.514523
75	-7.288624	110.486563	259	-7.383762	110.515117
76	-7.291633	110.487202	260	-7.384548	110.515229
77	-7.292323	110.488113	261	-7.385140	110.514744
78	-7.292393	110.488994	262	-7.385349	110.514127
79	-7.292339	110.490083	263	-7.385752	110.513504
80	-7.291809	110.491138	264	-7.385961	110.512890
81	-7.291276	110.492199	265	-7.386357	110.512272
82	-7.290013	110.493019	266	-7.386351	110.511670
83	-7.288812	110.493853	267	-7.386366	110.511066
84	-7.290290	110.494132	268	-7.386772	110.510452
85	-7.291977	110.493323	269	-7.386781	110.509850
86	-7.292386	110.493777	270	-7.386791	110.509249
87	-7.293200	110.494682	271	-7.386810	110.508046
88	-7.294588	110.495168	272	-7.386819	110.507445
89	-7.295996	110.496076	273	-7.386829	110.506844
90	-7.296338	110.496951	274	-7.386838	110.506244
91	-7.297268	110.497834	275	-7.386845	110.505793
92	-7.298186	110.498498	276	-7.387048	110.505042
93	-7.298457	110.499363	277	-7.387057	110.504442
94	-7.298738	110.500227	278	-7.386883	110.503842
95	-7.299788	110.501099	279	-7.386899	110.503242
96	-7.300343	110.502816	280	-7.386908	110.502942

97	-7.300621	110.503673	281	-7.386949	110.501443
98	-7.300516	110.504528	282	-7.386774	110.500990
99	-7.300411	110.505384	283	-7.387530	110.500705
100	-7.300279	110.506456	284	-7.387737	110.500112
101	-7.300239	110.507314	285	-7.388126	110.499674
102	-7.300629	110.508167	286	-7.388149	110.499080
103	-7.301812	110.509005	287	-7.388172	110.498485
104	-7.302198	110.509851	288	-7.388194	110.497742
105	-7.301793	110.510711	289	-7.388023	110.497141
106	-7.300195	110.511388	290	-7.387853	110.496539
107	-7.298580	110.511857	291	-7.387870	110.495944
108	-7.296535	110.512559	292	-7.388264	110.495367
109	-7.294921	110.513039	293	-7.388474	110.494635
110	-7.293819	110.513725	294	-7.388491	110.494042
111	-7.294609	110.514575	295	-7.388513	110.493302
112	-7.294921	110.515440	296	-7.388900	110.492880
113	-7.293752	110.515920	297	-7.388917	110.492290
114	-7.292909	110.516612	298	-7.388584	110.491530
115	-7.292882	110.517493	299	-7.387828	110.491778
116	-7.292855	110.518374	300	-7.387421	110.492347
117	-7.292043	110.517970	301	-7.386880	110.491867
118	-7.290401	110.517821	302	-7.386315	110.491532
119	-7.288726	110.517448	303	-7.385750	110.491045
120	-7.289162	110.518097	304	-7.385186	110.490405
121	-7.289979	110.518949	305	-7.384215	110.490337
122	-7.290379	110.519818	306	-7.383038	110.490255

123	-7.291593	110.520420	307	-7.382236	110.490199
124	-7.292397	110.520819	308	-7.382629	110.490531
125	-7.294429	110.520491	309	-7.382619	110.490988
126	-7.295220	110.519577	310	-7.381803	110.491546
127	-7.296870	110.519275	311	-7.381207	110.491048
128	-7.297670	110.520101	312	-7.380812	110.490560
129	-7.298840	110.520902	313	-7.379995	110.490504
130	-7.300025	110.520836	314	-7.379168	110.490603
131	-7.301622	110.519679	315	-7.378345	110.490236
132	-7.302797	110.519192	316	-7.378775	110.489644
133	-7.304351	110.518479	317	-7.378162	110.489133
134	-7.305498	110.518213	318	-7.377759	110.488479
135	-7.307490	110.517488	319	-7.376925	110.488101
136	-7.309047	110.517207	320	-7.376729	110.487459
137	-7.310880	110.517126	321	-7.377166	110.486868
138	-7.312329	110.517061	322	-7.378012	110.486628
139	-7.313407	110.517013	323	-7.378026	110.486006
140	-7.314830	110.516950	324	-7.378041	110.485385
141	-7.317152	110.516638	325	-7.378062	110.484453
142	-7.318945	110.516357	326	-7.378285	110.483852
143	-7.319652	110.516925	327	-7.378715	110.483274
144	-7.320001	110.517906	328	-7.379140	110.482853
145	-7.320349	110.518686	329	-7.379160	110.481926
146	-7.321397	110.519423	330	-7.379173	110.481154
147	-7.322049	110.520180	331	-7.379186	110.480381
148	-7.322370	110.520953	332	-7.378571	110.479688

149	-7.322983	110.521707	333	-7.377737	110.479276
150	-7.323879	110.522245	334	-7.377100	110.479355
151	-7.325364	110.522154	335	-7.376246	110.479409
152	-7.326109	110.522686	336	-7.375829	110.478729
153	-7.325858	110.523480	337	-7.375411	110.478206
154	-7.326582	110.524202	338	-7.374785	110.477497
155	-7.328179	110.524085	339	-7.374150	110.476941
156	-7.329438	110.523800	340	-7.373281	110.476669
157	-7.330393	110.524304	341	-7.372600	110.477217
158	-7.331346	110.524996	342	-7.372364	110.477665
159	-7.332257	110.525497	343	-7.371899	110.478246
160	-7.333158	110.525995	344	-7.370782	110.478109
161	-7.334349	110.526654	345	-7.369654	110.477970
162	-7.334939	110.527169	346	-7.368777	110.477541
163	-7.335820	110.527845	347	-7.368129	110.477139
164	-7.336990	110.528114	348	-7.367262	110.476546
165	-7.336693	110.528890	349	-7.366366	110.476435
166	-7.336394	110.529669	350	-7.365424	110.476314
167	-7.337270	110.529771	351	-7.364372	110.476000
168	-7.338408	110.529661	352	-7.363414	110.475876
169	-7.339553	110.529920	353	-7.362710	110.475621
170	-7.339556	110.530845	354	-7.361513	110.475468
171	-7.340719	110.530908	355	-7.360524	110.475170
172	-7.341005	110.529958	356	-7.359461	110.474682
173	-7.341578	110.529166	357	-7.358661	110.474229
174	-7.342720	110.528688	358	-7.357539	110.474408

175	-7.343631	110.529141	359	-7.356684	110.474628
176	-7.343673	110.529861	360	-7.355601	110.474479
177	-7.344247	110.529438	361	-7.354502	110.474675
178	-7.345010	110.529911	362	-7.353726	110.474053
179	-7.346074	110.529986	363	-7.352870	110.474457
180	-7.347426	110.530028	364	-7.352820	110.475146
181	-7.348044	110.530493	365	-7.352508	110.475627
182	-7.348678	110.531130	366	-7.351365	110.476005
183	-7.349308	110.531763	367	-7.350235	110.476039
184	-7.349384	110.532457	368	-7.349108	110.475898



LAMPIRAN 2 : Program R untuk menghitung Luas Lapangan Sepak Bola UKSW, Rawa Pening dan Kota Salatiga.

Program R_{i386.3.3.1} untuk menghitung luas Lapangan Sepak Bola UKSW, Rawa Pening, Kota Salatiga Menggunakan Metode Pendekatan Lingkaran

1. Asumsi Bumi Berbentuk Bola

#Step 1: klik file dan pilih change directory untuk read table (titik-titik koordinat)

```
Namatabel = read.table(' Namatabel.txt')
```

#Step 2: ubah tabel menjadi matriks

```
ubah = function(mat)
```

```
{  
m = dim(mat)[1]
```

```
n = dim(mat)[2]
```

```
has = matrix(0, m, n)
```

```
for (i in 1:m)
```

```
{  
for (j in 1:n)
```

```
has[i,j] = mat[i,j]
```

```
}
```

```
has
```

```
}
```

```
Namatabel = ubah(Namatabel)
```

#Step 3: mencari jarak antar dua titik

```
cari.jarak = function(x,y)
```

```
{
```

```
phi1 = x[1]
```

```
phi2 = y[1]
```

```
L1=x[2]
```

```

L2=y[2]

d=acos(sin(phi1*pi/180)*sin(phi2*pi/180)+cos(phi1*pi/180)*cos(phi2*pi/180)*c
os((L1-L2)*pi/180))

s=d*6371000

return(s)
}

cari.jarak(Namatabel[1,], Namatabel[2,])

```

#step 4: menentukan luas lingkaran

```

Luas = function(matriks)
{
m = dim(matriks)[1]
pusat = matriks[1,]
hasil = numeric(m-1)
for (i in 1:(m-1))
{
hasil[i]= cari.jarak(pusat, matriks[i+1,])
}
r = mean(hasil)
return(pi*r^2)
}

Luas(Namatabel)

```

2. Asumsi Bumi Berbentuk Elipsoida

#Step 1: klik file dan pilih change directory untuk read table (titik-titik koordinat)

```
Namatabel = read.table(' Namatabel.txt')
```

#Step 2: ubah tabel menjadi matriks

```
ubah = function(mat)
```

```

{
m = dim(mat)[1]
n = dim(mat)[2]
has = matrix(0, m, n)
for (i in 1:m)
{
for (j in 1:n) has[i,j] = mat[i,j]
}
has
}
Namatabel = ubah(Namatabel)
#Step 3: mencari jarak antar dua titik
cari.jarak = function(x,y)
{
phi1 = x[1]
phi2 = y[1]
L1=x[2]
L2=y[2]
F=((phi1*pi/180)+(phi2*pi/180))/2
G=((phi1*pi/180)-(phi2*pi/180))/2
n=((L1*pi/180)-(L2*pi/180))/2
S=(sin(G))^2*(cos(n))^2+(cos(F))^2*(sin(n))^2
C=(cos(G))^2*(cos(n))^2+(sin(F))^2*(sin(n))^2
w=atan(sqrt(S/C))
R=(sqrt(S*C))/w
a=6378.14
D=2*w*a

```

$$H1=(3*R-1)/(2*C)$$

$$H2=(3*R+1)/(2*S)$$

$$f=1/298.257$$

$$s=D*(1+f*H1*(\sin(F))^2*(\cos(G))^2-f*H2*(\cos(F))^2*(\sin(G))^2)$$

return(s)

}

cari.jarak(Namatabel[1,], Namatabel[2,])

#step 4: menentukan luas lingkaran

Luas = function(matriks)

{

m = dim(matriks)[1]

pusat = matriks[1,]

hasil = numeric(m-1)

for (i in 1:(m-1))

{

hasil[i] = cari.jarak(pusat, matriks[i+1,])

}

r = mean(hasil)

return(pi*r^2)

}

Luas(Namatabel)

LAMPIRAN 3 : Program R untuk menghitung Luas Kabupaten Semarang.

Program R_{i386.3.3.1} untuk menghitung luas Kabupaten Semarang dengan Menggunakan Metode Pendekatan Segitiga sferik

1. Asumsi Bumi Berbentuk Bola

#Step 1: klik file dan pilih change directory untuk read table (titik-titik koordinat)

```
atas = read.table(' atas.txt')
```

```
bawah = read.table('bawah.txt')
```

#Step 2: mengubah tabel menjadi matriks

```
ubah = function(mat)
```

```
{
```

```
    m = dim(mat)[1]
```

```
    n = dim(mat)[2]
```

```
    has = matrix(0, m, n)
```

```
    for (i in 1:m)
```

```
    {
```

```
        for (j in 1:n) has[i,j] = mat[i,j]
```

```
    }
```

```
    has
```

```
}
```

```
atas = ubah(atas)
```

```
bawah= ubah(bawah)
```

#step 3: cari jarak antar dua titik

```
cari.jarak = function(x,y)
```

```
{
```

```
    phi1 = x[1]
```

```
    phi2 = y[1]
```

```
    L1=x[2]
```

L2=y[2]

d=acos(sin(phi1*pi/180)*sin(phi2*pi/180)+cos(phi1*pi/180)*cos(phi2*pi/180)*cos((L1-L2)*pi/180))

s=d*6371

return(s)

}

cari.jarak(atas[1,],bawah[2,])

#step 4: menentukan luas segitiga sferik

r = 6371

luas.segitiga = function(x,y,z)

{

options(digits=8)

a1 = cari.jarak(x,y)

b1 = cari.jarak(y,z)

c1 = cari.jarak(z,x)

a2 = cos(a1*pi/180/(2*pi*r/360))

b2 = cos(b1*pi/180/(2*pi*r/360))

c2 = cos(c1*pi/180/(2*pi*r/360))

a3 = sin(a1*pi/180/(2*pi*r/360))

b3 = sin(b1*pi/180/(2*pi*r/360))

c3 = sin(c1*pi/180/(2*pi*r/360))

A = acos((a2-b2*c2)/b3/c3)

B = acos((b2-c2*a2)/a3/c3)

C = acos((c2-b2*a2)/a3/b3)

l = (A+B+C-pi)*r^2

1

```
}  
luas.segitiga(atas[1,],atas[2,],bawah[2,])
```

#step 5: menghitung jumlahan dua segitiga

```
luas.segiempat = function(x,y,u,v)  
{  
    L1=luas.segitiga(x,y,u)  
    L2=luas.segitiga(x,u,v)  
    L=L1+L2  
L  
}  
luas.segiempat(atas[2,],atas [3,],bawah[3,], bawah[2,])
```

#step 6: menghitung luas total

```
Luas = function(matriks1, matriks2)  
{  
    m = dim(matriks1)[1]  
    has=numeric(m-1)  
    has[1]=luas.segitiga(matriks1[1,],matriks1[2,],matriks2[2,])  
    for (i in 2:(m-2))  
    {  
        has[i] = luas.segiempat(matriks1[i,],  
matriks1[i+1,],matriks2[i+1,], matriks2[i,])  
    }  
    has[m-1]=luas.segitiga(matriks1[m-  
1,],matriks1[m,],matriks2[m-1,])  
}  
Luas(atas,bawah)  
has = Luas(atas,bawah)
```

```
sum(has)
```

2. Asumsi Bumi Berbentuk Elipsoida

#Step 1: klik file dan pilih change directory untuk read table (titik-titik koordinat)

```
atas = read.table('atas.txt')
```

```
bawah = read.table('bawah.txt')
```

#Step 2: mengubah tabel menjadi matriks

```
ubah = function(mat)
```

```
{  
    m = dim(mat)[1]  
    n = dim(mat)[2]  
    has = matrix(0, m, n)  
    for (i in 1:m)  
    {  
        for (j in 1:n) has[i,j] = mat[i,j]  
    }  
    has  
}
```

```
atas = ubah(atas)
```

```
bawah= ubah(bawah)
```

#step 3: cari jarak antar dua titik

```
cari.jarak = function(x,y)
```

```
{  
    phi1 = x[1]  
    phi2 = y[1]  
    L1=x[2]
```



```

L2=y[2]
F=((phi1*pi/180)+(phi2*pi/180))/2
G=((phi1*pi/180)-(phi2*pi/180))/2
n=((L1*pi/180)-(L2*pi/180))/2
S=(sin(G))^2*(cos(n))^2+(cos(F))^2*(sin(n))^2
C=(cos(G))^2*(cos(n))^2+(sin(F))^2*(sin(n))^2
w=atan(sqrt(S/C))
R=(sqrt(S*C))/w
a=6378.14
D=2*w*a
H1=(3*R-1)/(2*C)
H2=(3*R+1)/(2*S)
f=1/298.257
s=D*(1+f*H1*(sin(F))^2*(cos(G))^2-
f*H2*(cos(F))^2*(sin(G))^2)
return(s)
}
cari.jarak(c1[1,],c1[2,])

```

#step 4: menentukan luas segitiga sferik

```

r = 6371
luas.segitiga = function(x,y,z)
{
    options(digits=8)
    a1 = cari.jarak(x,y)
    b1 = cari.jarak(y,z)
    c1 = cari.jarak(z,x)

```

$$a2 = \cos(a1 \cdot \pi / 180 / (2 \cdot \pi \cdot r / 360))$$

$$b2 = \cos(b1 \cdot \pi / 180 / (2 \cdot \pi \cdot r / 360))$$

$$c2 = \cos(c1 \cdot \pi / 180 / (2 \cdot \pi \cdot r / 360))$$

$$a3 = \sin(a1 \cdot \pi / 180 / (2 \cdot \pi \cdot r / 360))$$

$$b3 = \sin(b1 \cdot \pi / 180 / (2 \cdot \pi \cdot r / 360))$$

$$c3 = \sin(c1 \cdot \pi / 180 / (2 \cdot \pi \cdot r / 360))$$

$$A = \arccos((a2 - b2 \cdot c2) / b3 / c3)$$

$$B = \arccos((b2 - c2 \cdot a2) / a3 / c3)$$

$$C = \arccos((c2 - b2 \cdot a2) / a3 / b3)$$

$$l = (A + B + C - \pi) \cdot r^2$$

1

}

luas.segitiga(atas[1,],atas[2,],bawah[2,])

#step 5: menghitung jumlahan dua segitiga

luas.segiempat = function(x,y,u,v)

{

L1=luas.segitiga(x,y,u)

L2=luas.segitiga(x,u,v)

L=L1+L2

L

}

luas.segiempat(atas[2,],atas [3,],bawah[3,], bawah[2,])

#step 6: menghitung luas total

Luas = function(matriks1, matriks2)

{

```

m = dim(matriks1)[1]
has=numeric(m-1)
has[1]=luas.segitiga(matriks1[1,],matriks1[2,],matriks2[2,])
for (i in 2:(m-2))
{
  has[i] = luas.segiempat(matriks1[i,],
matriks1[i+1,],matriks2[i+1,], matriks2[i,])
}
has[m-1]=luas.segitiga(matriks1[m-
1,],matriks1[m,],matriks2[m-1,])
}
Luas(atas,bawah)
has = Luas(atas,bawah)
sum(has)

```

LAMPIRAN 4 :Sertifikat Pemakalah Seminar Nasional Matematika dan Pendidikan Matematika di Universitas Sebelas Maret.



LAMPIRAN 5 :Sertifikat Pemakalah Seminar Nasional Pendidikan Matematika di Universitas Ahmad Dahlan.

