Boruvka Extra Credit

Problem: Your friend Bubba needs to build an electrical power network among 28 towns so that:

1. every town is connected to the network; and
2. the total length of the network is the shortest possible.

Bubba knows the distances between the towns (see tables below) but he has lost all maps of the region. Your job is to use Boruvka's algorithm to find the optimal way to create his network. Show your work, and as part of your final answer draw the network. Your network diagram does not need to be to scale or show any orientation - just the proper connections between the labeled towns 1-28.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.	5.74	0.7	6.59	1.12	6.8	1.12	11.6	1.36	13.6	6.02	10.	6.61	9.15
2	5.74	0.	5.3	0.86	5.25	1.08	4.67	7.51	6.94	9.2	0.283	5.66	0.894	4.79
3	0.7	5.3	0.	6.16	0.447	6.38	1.02	10.9	2.04	12.9	5.58	9.38	6.19	8.51
4	6.59	0.86	6.16	0.	6.11	0.235	5.52	7.18	7.78	8.76	0.583	5.32	0.141	4.49
5	1.12	5.25	0.447	6.11	0.	6.33	1.34	10.6	2.41	12.6	5.52	9.09	6.14	8.23
6	6.8	1.08	6.38	0.235	6.33	0.	5.72	7.2	7.98	8.74	0.81	5.34	0.198	4.54
7	1.12	4.67	1.02	5.52	1.34	5.72	0.	10.9	2.28	12.9	4.95	9.24	5.52	8.35
8	11.6	7.51	10.9	7.18	10.6	7.2	10.9	0.	13.	2.06	7.35	1.87	7.31	2.73
9	1.36	6.94	2.04	7.78	2.41	7.98	2.28	13.	0.	15.	7.22	11.4	7.78	10.5
10	13.6	9.2	12.9	8.76	12.6	8.74	12.9	2.06	15.	0	9.01	3.63	8.87	4.54
11	6.02	0.283	5.58	0.583	5.52	0.81	4.95	7.35	7.22	9.01	0.	5.49	0.632	4.63
12	10.	5.66	9.38	5.32	9.09	5.34	9.24	1.87	11.4	3.63	5.49	0.	5.44	0.906
13	6.61	0.894	6.19	0.141	6.14	0.198	5.52	7.31	7.78	8.87	0.632	5.44	0.	4.62
14	9.15	4.79	8.51	4.49	8.23	4.54	8.35	2.73	10.5	4.54	4.63	0.906	4.62	0.
15	6.64	1.02	6.24	0.424	6.22	0.357	5.54	7.56	7.78	9.09	0.8	5.69	0.283	4.88
16	16.4	12.4	15.7	11.9	15.4	11.9	15.8	4.91	17.8	3.21	12.2	6.72	12.1	7.61
17	12.4	8.3	11.7	7.96	11.4	7.97	11.7	0.8	13.7	1.41	8.14	2.65	8.08	3.52
18	16.3	12.1	15.6	11.7	15.3	11.7	15.6	4.74	17.7	2.93	11.9	6.5	11.8	7.4
19	12.9	8.51	12.3	8.06	12.	8.04	12.2	1.49	14.3	0.7	8.32	2.94	8.17	3.85
20	16.7	12.4	16.	11.9	15.7	11.9	16.	5.1	18.	3.2	12.2	6.82	12.1	7.72
21	9.69	5.25	9.05	4.9	8.77	4.93	8.89	2.28	11.	4.02	5.08	0.412	5.03	0.539
22	0.412	5.4	0.316	6.26	0.762	6.47	0.906	11.2	1.77	13.2	5.69	9.62	6.28	8.75
23	16.3	12.3	15.6	11.9	15.2	11.9	15.6	4.8	17.6	3.16	12.1	6.62	12.	7.51
24	0.955	5.24	0.269	6.1	0.18	6.32	1.19	10.7	2.27	12.7	5.52	9.18	6.13	8.32
25	16.6	12.4	15.9	12.	15.5	12.	15.9	5.02	17.9	3.26	12.2	6.8	12.1	7.7
26	1.	5.03	1.22	5.87	1.63	6.07	0.5	11.4	1.91	13.3	5.32	9.73	5.87	8.83
27	16.4	12.1	15.7	11.7	15.4	11.7	15.7	4.81	17.7	2.93	11.9	6.54	11.8	7.44
28	1.58	7.15	2.26	7.99	2.62	8.19	2.5	13.2	0.224	15.2	7.43	11.6	7.99	10.7

	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	6.64	16.4	12.4	16.3	12.9	16.7	9.69	0.412	16.3	0.955	16.6	1.	16.4	1.58
2	1.02	12.4	8.3	12.1	8.51	12.4	5.25	5.4	12.3	5.24	12.4	5.03	12.1	7.15
3	6.24	15.7	11.7	15.6	12.3	16.	9.05	0.316	15.6	0.269	15.9	1.22	15.7	2.26
4	0.424	11.9	7.96	11.7	8.06	11.9	4.9	6.26	11.9	6.1	12.	5.87	11.7	7.99
5	6.22	15.4	11.4	15.3	12.	15.7	8.77	0.762	15.2	0.18	15.5	1.63	15.4	2.62
6	0.357	11.9	7.97	11.7	8.04	11.9	4.93	6.47	11.9	6.32	12.	6.07	11.7	8.19
7	5.54	15.8	11.7	15.6	12.2	16.	8.89	0.906	15.6	1.19	15.9	0.5	15.7	2.5
8	7.56	4.91	0.8	4.74	1.49	5.1	2.28	11.2	4.8	10.7	5.02	11.4	4.81	13.2
9	7.78	17.8	13.7	17.7	14.3	18.	11.	1.77	17.6	2.27	17.9	1.91	17.7	0.224
10	9.09	3.21	1.41	2.93	0.7	3.2	4.02	13.2	3.16	12.7	3.26	13.3	2.93	15.2
11	0.8	12.2	8.14	11.9	8.32	12.2	5.08	5.69	12.1	5.52	12.2	5.32	11.9	7.43
12	5.69	6.72	2.65	6.5	2.94	6.82	0.412	9.62	6.62	9.18	6.8	9.73	6.54	11.6
13	0.283	12.1	8.08	11.8	8.17	12.1	5.03	6.28	12.	6.13	12.1	5.87	11.8	7.99
14	4.88	7.61	3.52	7.4	3.85	7.72	0.539	8.75	7.51	8.32	7.7	8.83	7.44	10.7
15	0.	12.3	8.32	12.	8.4	12.3	5.28	6.32	12.2	6.2	12.3	5.87	12.	7.99
16	12.3	0.	4.12	0.443	3.89	0.795	7.12	16.	0.237	15.5	0.21	16.3	0.665	18.
17	8.32	4.12	0	3.95	1.04	4.32	3.06	12.	4.00	11.5	4.22	12.2	4.02	13.9
18	12.	0.443	3.95	0.	3.62	0.5	6.9	15.9	0.608	15.4	0.361	16.1	0.252	17.9
19	8.4	3.89	1.04	3.62	0.	3.9	3.32	12.5	3.83	12.1	3.95	12.7	3.63	14.5
20	12.3	0.795	4.32	0.5	3.9	0.	7.21	16.3	1.02	15.8	0.6	16.5	0.309	18.3
21	5.28	7.12	3.06	6.9	3.32	7.21	0.	9.28	7.03	8.86	7.2	9.37	6.93	11.3
22	6.32	16.	12.	15.9	12.5	16.3	9.28	0.	15.9	0.585	16.1	0.985	16.	1.99
23	12.2	0.237	4.00	0.608	3.83	1.02	7.03	15.9	0	15.4	0.447	16.1	0.853	17.8
24	6.2	15.5	11.5	15.4	12.1	15.8	8.86	0.585	15.4	0.	15.6	1.45	15.5	2.48
25	12.3	0.21	4.22	0.361	3.95	0.6	7.2	16.1	0.447	15.6	0.	16.4	0.525	18.1
26	5.87	16.3	12.2	16.1	12.7	16.5	9.37	0.985	16.1	1.45	16.4	0	16.2	2.12
27	12.	0.665	4.02	0.252	3.63	0.309	6.93	16.	0.853	15.5	0.525	16.2	0.	18.
28	7.99	18.	13.9	17.9	14.5	18.3	11.3	1.99	17.8	2.48	18.1	2.12	18.	0.