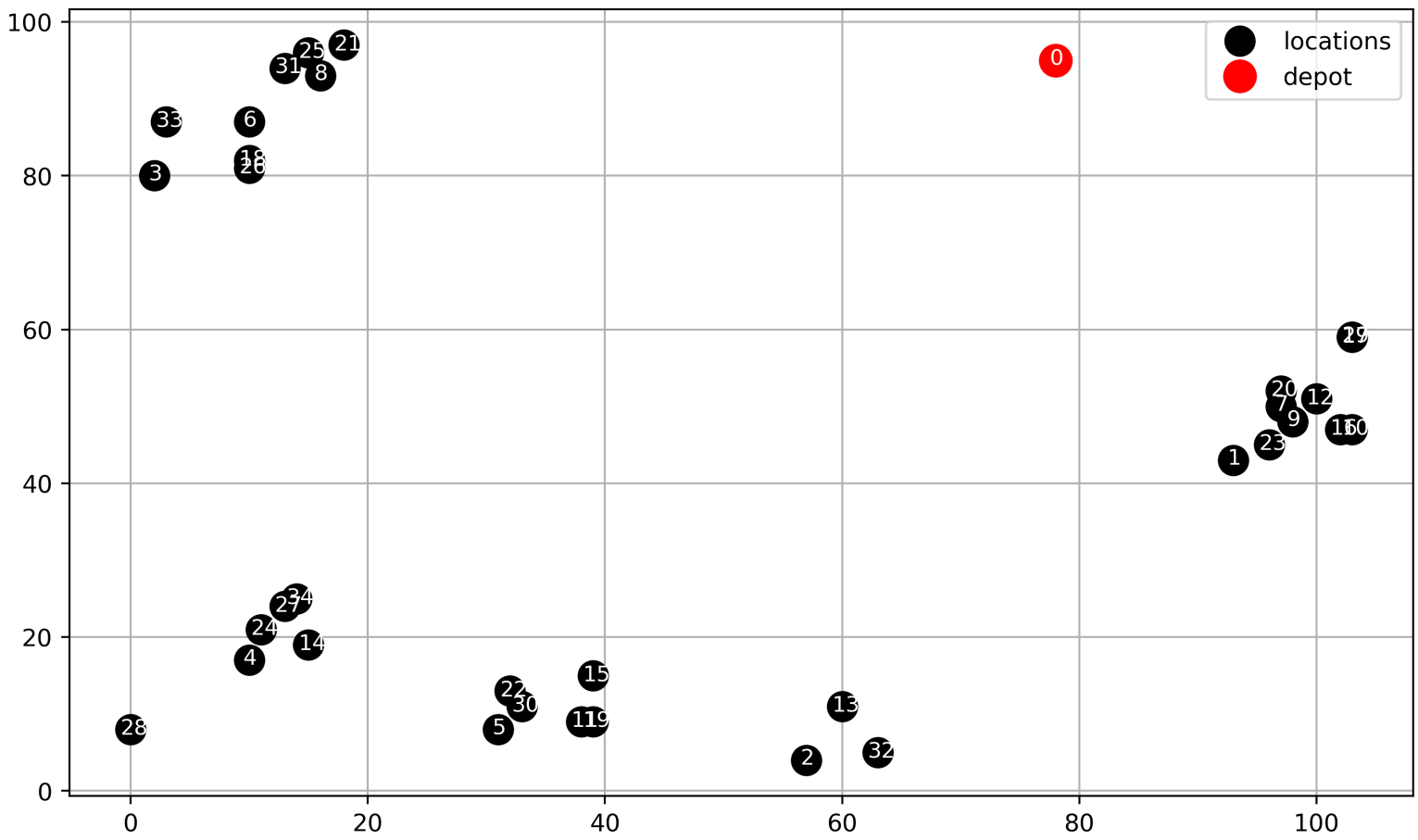
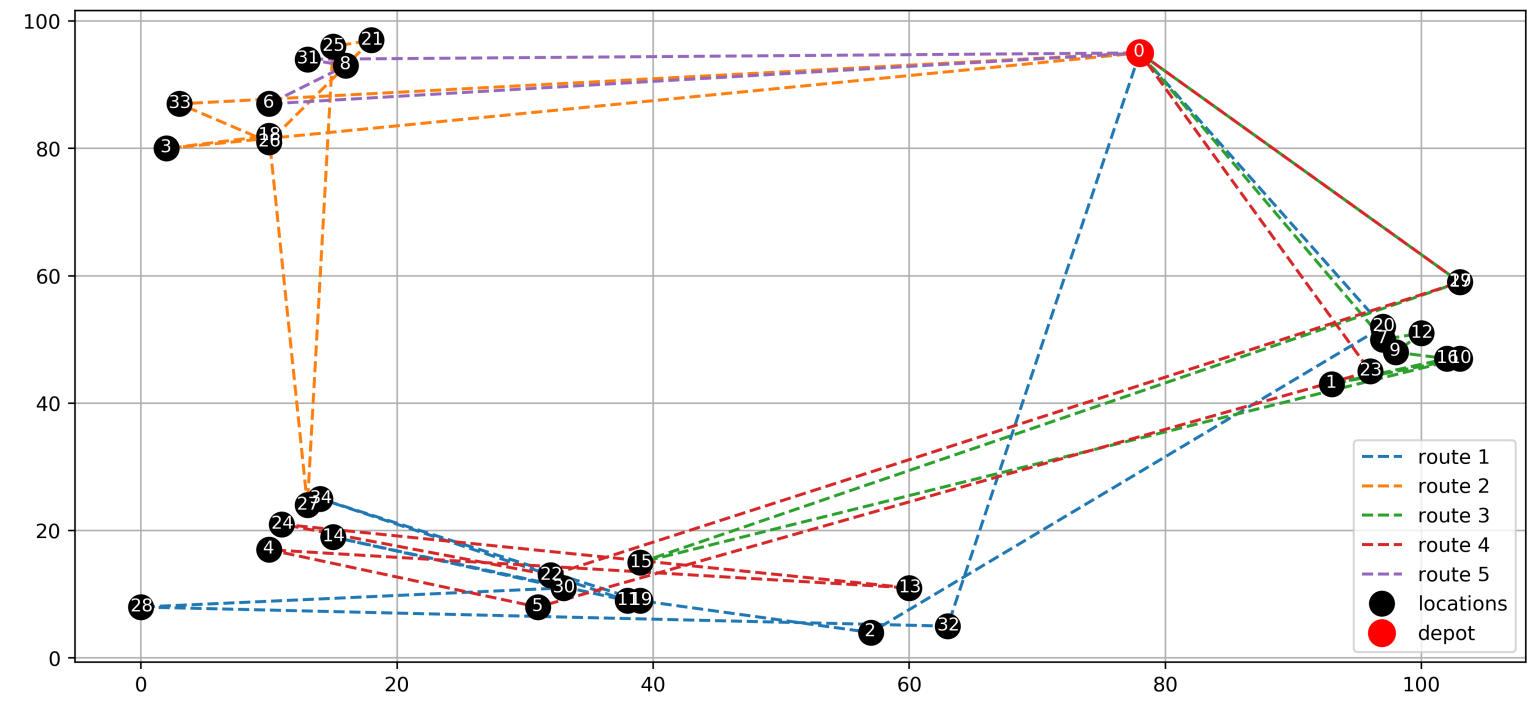
Лабораторная работа №5. Capacitated Vehicle Routing Problem

Илья Седунов,
Вадим Альперович,
17ПМИ

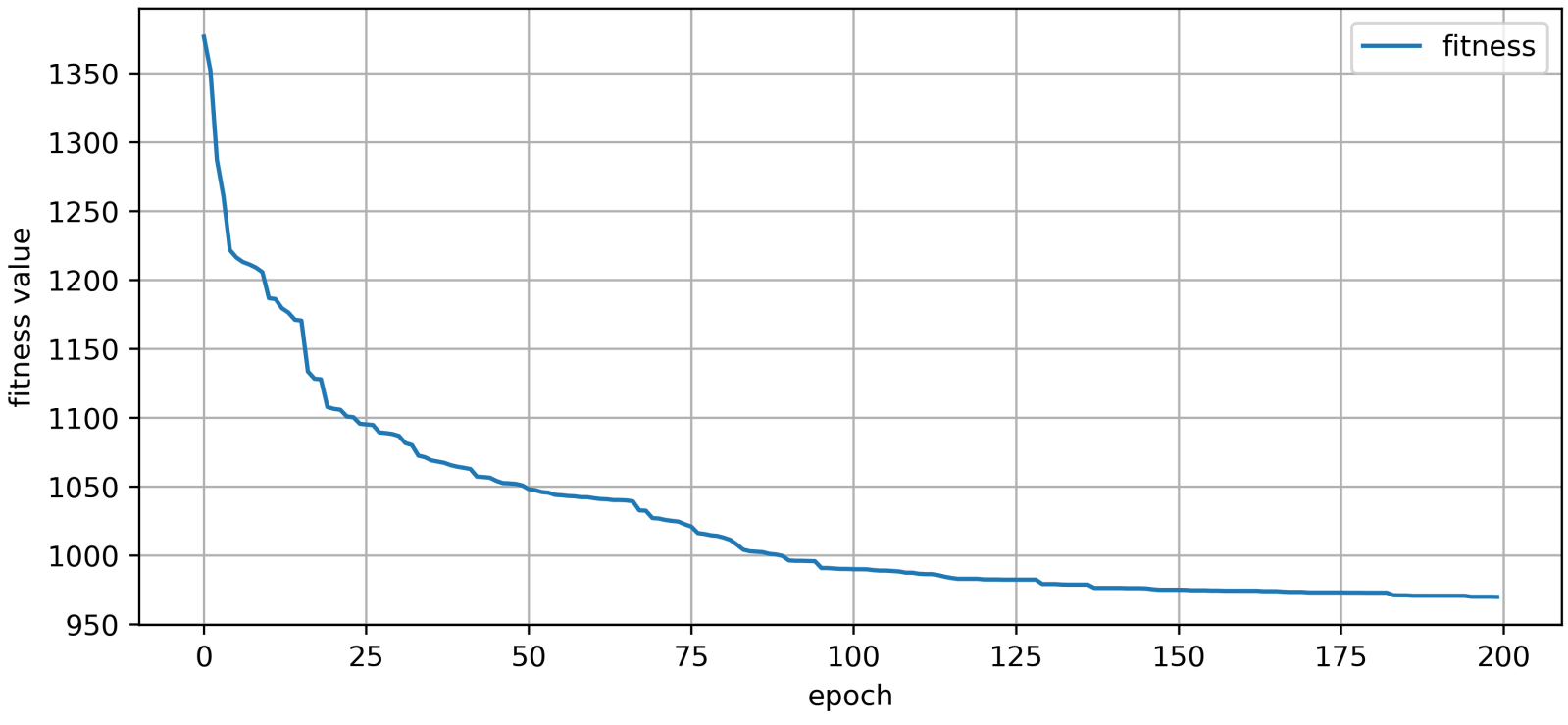


Random solution

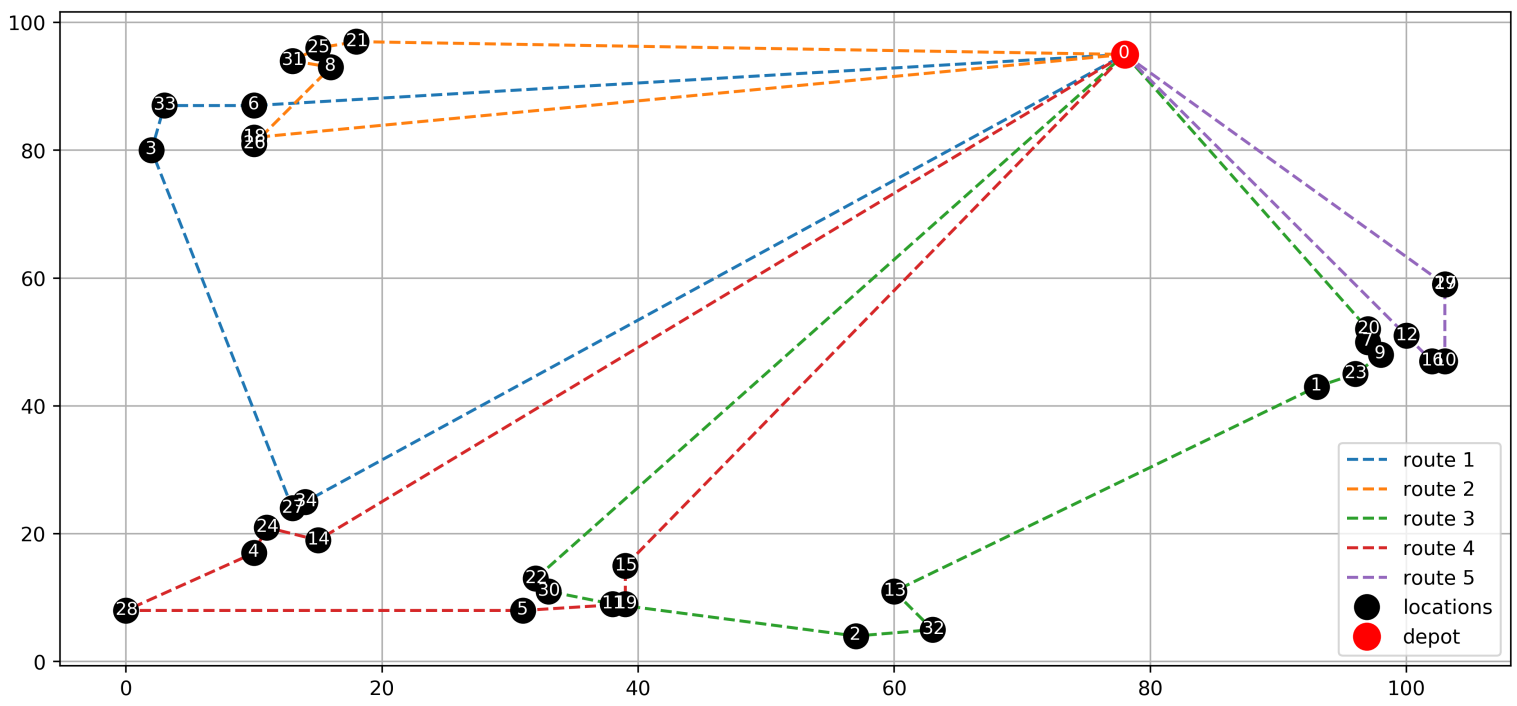


Artifical Bee Colony (ABC) algorithm

Fitness function



And solution with 200 epochs



A-benchmarks

	benchmark	n_locations	n_trucks	capacity	optimal_cost	ABC_cost	ABC_time	error	is_feasible
0	A-n32-k5.vrp	32	5	100	784	793.689	34.4186	0.0123585	True
1	A-n33-k5.vrp	33	5	100	661	677.849	33.94	0.0254898	True
2	A-n33-k6.vrp	33	6	100	742	789.651	35.5225	0.0642203	True
3	A-n34-k5.vrp	34	5	100	778	890.053	34.7679	0.144027	True
4	A-n36-k5.vrp	36	5	100	799	902.63	39.6765	0.129699	True
5	A-n37-k5.vrp	37	5	100	669	722.61	40.3947	0.0801341	True
6	A-n37-k6.vrp	37	6	100	949	1002.95	41.3557	0.0568444	True
7	A-n38-k5.vrp	38	5	100	730	796.663	39.2311	0.0913186	True
8	A-n39-k5.vrp	39	5	100	822	917.818	41.4462	0.116567	True
9	A-n39-k6.vrp	39	6	100	831	1039.23	46.8593	0.250572	True
10	A-n44-k6.vrp	44	6	100	937	987.494	51.036	0.0538888	True
11	A-n45-k6.vrp	45	6	100	944	1209.34	55.1767	0.281077	True
12	A-n45-k7.vrp	45	7	100	1146	1270.99	62.4989	0.109066	True
13	A-n46-k7.vrp	46	7	100	914	1030.53	73.3458	0.127491	True
14	A-n48-k7.vrp	48	7	100	1073	1195.6	71.0007	0.114257	True
15	A-n53-k7.vrp	53	7	100	1010	1151.61	82.1195	0.140208	True
16	A-n54-k7.vrp	54	7	100	1167	1331.5	86.6397	0.140958	True
17	A-n55-k9.vrp	55	9	100	1073	1147.89	98.8293	0.0697974	True
18	A-n60-k9.vrp	60	9	100	1354	1502.62	118.18	0.109762	True
19	A-n61-k9.vrp	61	9	100	1034	1398.01	129.125	0.352039	True

	benchmark	n_locations	n_trucks	capacity	optimal_cost	ABC_cost	ABC_time	error	is_feasible
20	A-n62-k8.vrp	62	8	100	1288	1517.37	119.281	0.178084	True
21	A-n63-k10.vrp	63	10	100	1314	1515.19	127.642	0.153113	True
22	A-n63-k9.vrp	63	9	100	1616	1959.36	131.052	0.212478	True
23	A-n64-k9.vrp	64	9	100	1401	1664.51	122.621	0.188088	True
24	A-n65-k9.vrp	65	9	100	1174	1558.45	133.355	0.327473	True
25	A-n69-k9.vrp	69	9	100	1159	1434.53	154.796	0.237731	True
26	A-n80-k10.vrp	80	10	100	1763	2203.57	184.733	0.249898	True

B-benchmarks

	benchmark	n_locations	n_trucks	capacity	optimal_cost	ABC_cost	ABC_time	error	is_feasible
0	B-n31-k5.vrp	31	5	100	672	706.569	20.9377	0.0514423	True
1	B-n34-k5.vrp	34	5	100	788	808.974	23.4713	0.0266171	True
2	B-n35-k5.vrp	35	5	100	955	996.195	24.5341	0.0431363	True
3	B-n38-k6.vrp	38	6	100	805	820.224	28.2701	0.0189118	True
4	B-n39-k5.vrp	39	5	100	549	567.277	26.7929	0.0332911	True
5	B-n41-k6.vrp	41	6	100	829	947.016	30.4575	0.142359	True
6	B-n43-k6.vrp	43	6	100	742	777.761	33.5126	0.0481955	True
7	B-n44-k7.vrp	44	7	100	909	985.969	36.6416	0.0846748	True
8	B-n45-k5.vrp	45	5	100	751	796.818	32.5534	0.0610096	True
9	B-n45-k6.vrp	45	6	100	678	768.834	37.3276	0.133974	True
10	B-n50-k7.vrp	50	7	100	741	763.865	41.6256	0.0308568	True
11	B-n50-k8.vrp	50	8	100	1312	1354.85	44.7541	0.0326566	True
12	B-n51-k7.vrp	51	7	100	1032	1124.62	42.9064	0.0897509	True
13	B-n52-k7.vrp	52	7	100	747	818.84	43.2389	0.0961716	True
14	B-n56-k7.vrp	56	7	100	707	792.316	47.4659	0.120674	True
15	B-n57-k7.vrp	57	7	100	1153	1555.21	66.0018	0.348837	True
16	B-n57-k9.vrp	57	9	100	1598	1740.66	57.6039	0.0892725	True
17	B-n63-k10.vrp	63	10	100	1496	1775.97	75.6478	0.187143	True
18	B-n64-k9.vrp	64	9	100	861	1082.98	75.0857	0.257812	True
19	B-n66-k9.vrp	66	9	100	1316	1611.2	82.5796	0.224317	True
20	B-n67-k10.vrp	67	10	100	1032	1206.82	86.4656	0.169402	True
21	B-n68-k9.vrp	68	9	100	1272	1442.81	67.5301	0.134288	True
22	B-n78-k10.vrp	78	10	100	1221	1602.17	93.2046	0.312182	True

In [ ]: