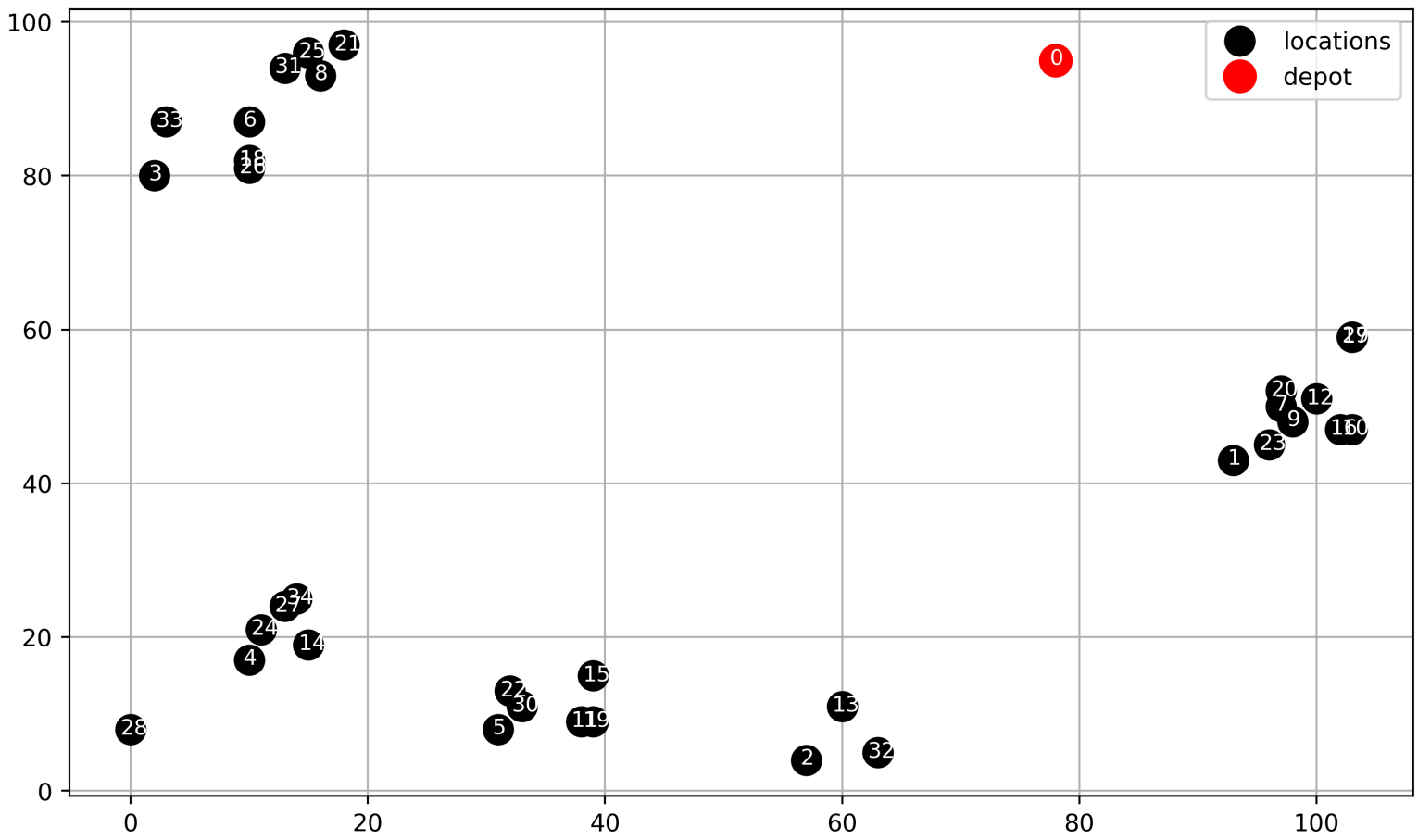
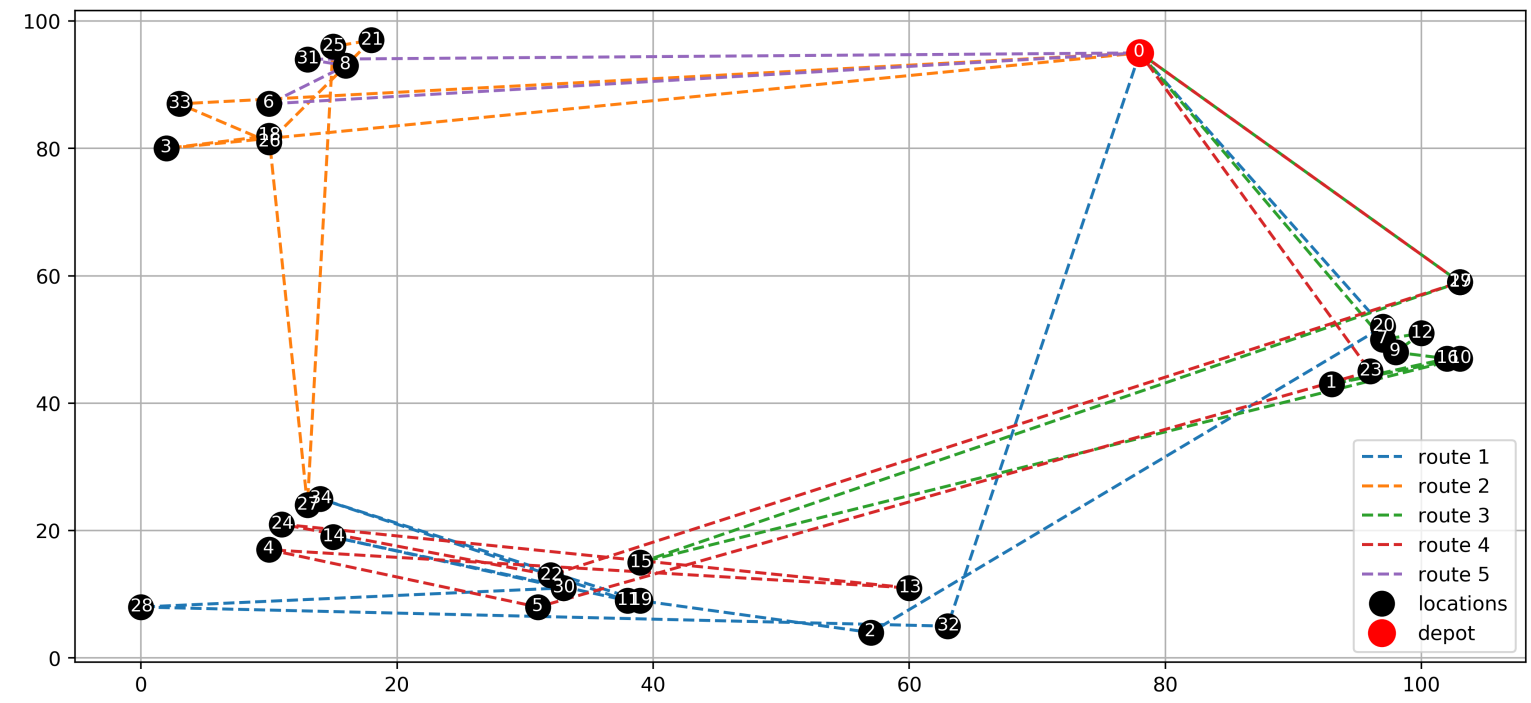
Лабораторная работа №5. Capacitated Vehicle Routing Problem

Илья Седунов,
Вадим Альперович,
17ПМИ

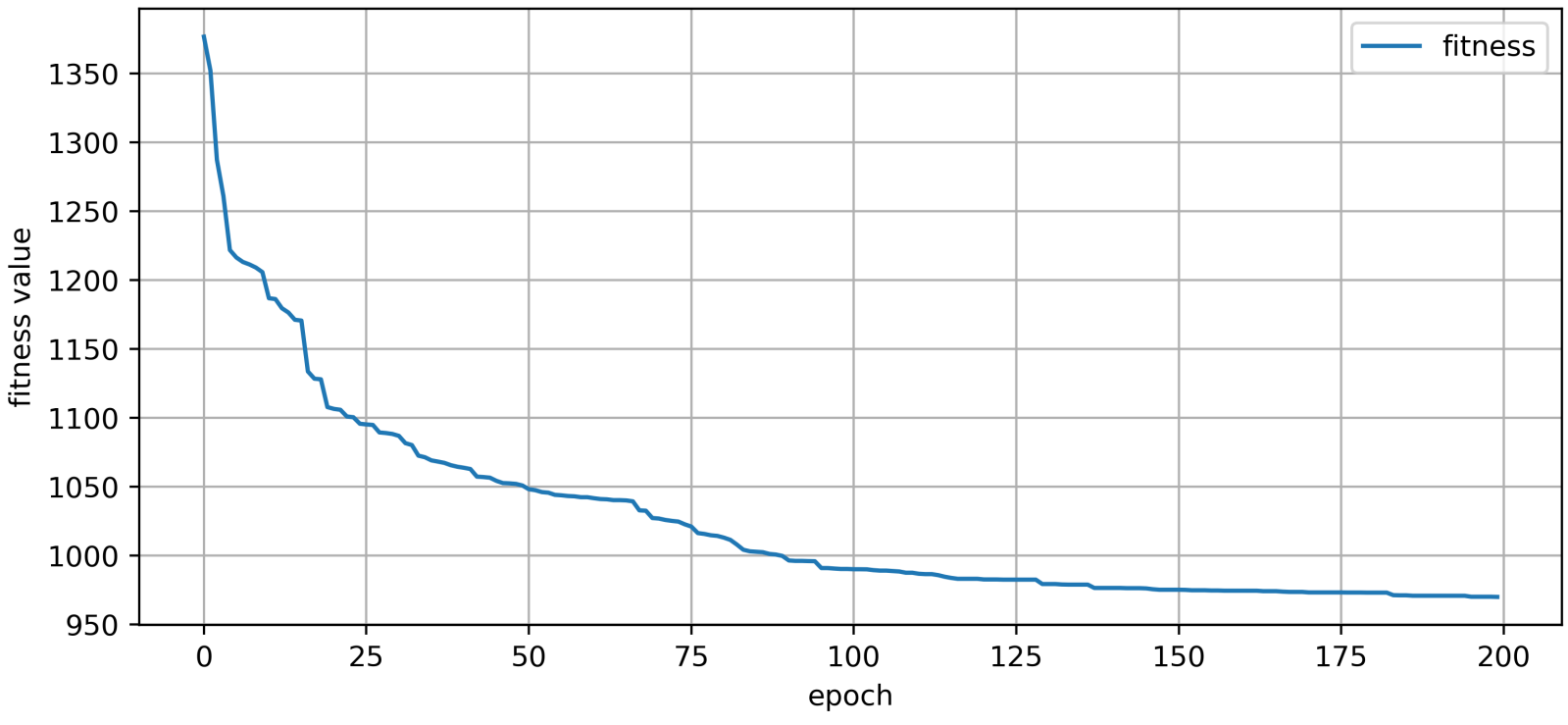


Random solution

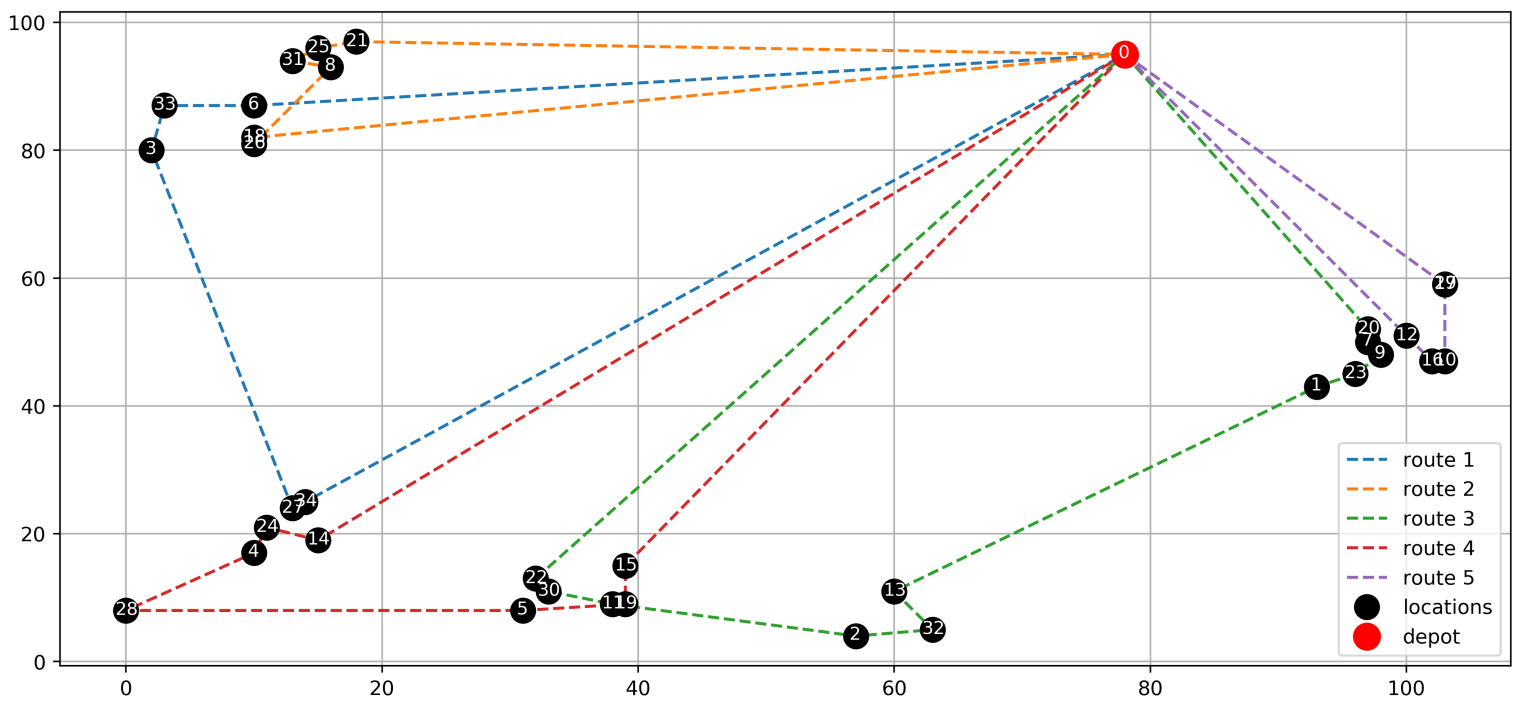


Artifical Bee Colony (ABC) algorithm

Fitness function



And solution with 200 epochs



A-benchmarks

	benchmark	n_locations	n_trucks	capacity	optimal_cost	ABC_cost	error	is_feasible
0	A-n32-k5.vrp	32	5	100	784	842.433	0.0745315	True
1	A-n33-k5.vrp	33	5	100	661	713.307	0.0791329	True
2	A-n33-k6.vrp	33	6	100	742	787.046	0.0607091	True
3	A-n34-k5.vrp	34	5	100	778	809.088	0.0399594	True
4	A-n36-k5.vrp	36	5	100	799	828.697	0.0371682	True
5	A-n37-k5.vrp	37	5	100	669	732.588	0.0950493	True
6	A-n37-k6.vrp	37	6	100	949	1046.12	0.102344	True
7	A-n38-k5.vrp	38	5	100	730	829.51	0.136315	True
8	A-n39-k5.vrp	39	5	100	822	877.592	0.0676301	True
9	A-n39-k6.vrp	39	6	100	831	873.5	0.0511426	True
10	A-n44-k6.vrp	44	6	100	937	1025.23	0.0941666	True
11	A-n45-k6.vrp	45	6	100	944	1203.13	0.274502	True
12	A-n45-k7.vrp	45	7	100	1146	1238.66	0.0808508	True
13	A-n46-k7.vrp	46	7	100	914	1018.24	0.114046	True
14	A-n48-k7.vrp	48	7	100	1073	1272.04	0.185502	True
15	A-n53-k7.vrp	53	7	100	1010	1272.69	0.260087	True
16	A-n54-k7.vrp	54	7	100	1167	1349.58	0.156455	True
17	A-n55-k9.vrp	55	9	100	1073	1277.18	0.190285	True
18	A-n60-k9.vrp	60	9	100	1354	1595.71	0.178513	True
19	A-n61-k9.vrp	61	9	100	1034	1335.7	0.291779	True

	benchmark	n_locations	n_trucks	capacity	optimal_cost	ABC_cost	error	is_feasible
20	A-n62-k8.vrp	62	8	100	1288	1530.41	0.188209	True
21	A-n63-k10.vrp	63	10	100	1314	1567.9	0.193228	True
22	A-n63-k9.vrp	63	9	100	1616	1906.81	0.179959	True
23	A-n64-k9.vrp	64	9	100	1401	1754.17	0.252086	True
24	A-n65-k9.vrp	65	9	100	1174	1528.02	0.301549	True
25	A-n69-k9.vrp	69	9	100	1159	1547.32	0.335051	True
26	A-n80-k10.vrp	80	10	100	1763	2280.44	0.2935	True

B-benchmarks

	benchmark	n_locations	n_trucks	capacity	optimal_cost	ABC_cost	error	is_feasible
0	B-n31-k5.vrp	31	5	100	672	696.441	0.0363712	True
1	B-n34-k5.vrp	34	5	100	788	826.332	0.0486451	True
2	B-n35-k5.vrp	35	5	100	955	1004.02	0.0513304	True
3	B-n38-k6.vrp	38	6	100	805	857.6	0.0653414	True
4	B-n39-k5.vrp	39	5	100	549	570.94	0.039963	True
5	B-n41-k6.vrp	41	6	100	829	1011.49	0.220132	True
6	B-n43-k6.vrp	43	6	100	742	778.271	0.0488821	True
7	B-n44-k7.vrp	44	7	100	909	1026.42	0.129177	True
8	B-n45-k5.vrp	45	5	100	751	774.988	0.0319418	True
9	B-n45-k6.vrp	45	6	100	678	1000.68	0.475932	True
10	B-n50-k7.vrp	50	7	100	741	761.781	0.0280448	True
11	B-n50-k8.vrp	50	8	100	1312	1364.05	0.0396721	True
12	B-n52-k7.vrp	52	7	100	747	788.78	0.0559301	True
13	B-n56-k7.vrp	56	7	100	707	749.917	0.0607036	True
14	B-n57-k7.vrp	57	7	100	1153	1532.13	0.328819	True
15	B-n57-k9.vrp	57	9	100	1598	1747.21	0.0933744	True
16	B-n63-k10.vrp	63	10	100	1496	1731.21	0.157224	True
17	B-n64-k9.vrp	64	9	100	861	1136.82	0.32035	True
18	B-n66-k9.vrp	66	9	100	1316	1616.46	0.228315	True
19	B-n67-k10.vrp	67	10	100	1032	1179.78	0.1432	True
20	B-n68-k9.vrp	68	9	100	1272	1753.32	0.378397	True
21	B-n78-k10.vrp	78	10	100	1221	1576.07	0.290804	True