Benchmarks for question 3 (TSP). For all the input sizes.

For 20 Cities

Nth test	Genetic Algorithm	Hill Climbing	Simmulated Annealing
1	0.09338855743	0.1958062649	0.1322619915
2	0.142455101	0.1163663864	0.3253965378
3	0.1052856445	0.1102020741	0.506018877
4	0.105047226	0.1286525726	0.5984759331
5	0.1174926758	0.1094624996	0.6849792004
6	0.1296758652	0.1205432415	0.7748007774
7	0.1382112503	0.126585722	0.8643307686
8	0.1450061798	0.139703989	0.9552180767
9	0.1116275787	0.1601529121	1.055032969
10	0.1075267792	0.1417534351	1.152785301
Average	0.1195716858	0.1349229097	0.7049300432

Ranked Tables:

Nth test	Genetic Algorithmran	RANK
1	0.09338855743	1
2	0.142455101	9
3	0.1052856445	3
4	0.105047226	2
5	0.1174926758	6
6	0.1296758652	7
7	0.1382112503	8

8	0.1450061798	10
9	0.1116275787	5
10	0.1075267792	4

Nth test	Hill Climbing	RANK
1	0.1958062649	10
2	0.1163663864	3
3	0.1102020741	2
4	0.1286525726	6
5	0.1094624996	1
6	0.1205432415	4
7	0.126585722	5
8	0.139703989	7
9	0.1601529121	9
10	0.1417534351	8

Nth test	Simulated Annealing	RANK
1	0.1322619915	1
2	0.3253965378	2
3	0.506018877	3
4	0.5984759331	4
5	0.6849792004	5
6	0.7748007774	6
7	0.8643307686	7
8	0.9552180767	8
9	1.055032969	9
10	1.152785301	10

For 16 cities

Nth test	Genetic Algorithm	Hill Climbing
1	0.3707170486	0.007028579712
2	0.07219314575	0.009086370468
3	0.09760856628	0.009299516678
4	0.09818077087	0.01071596146
5	0.1116514206	0.01265001297
6	0.1296758652	0.007605075836
7	0.2551794052	0.0079164505
8	0.07078647614	0.01262545586
9	0.03371238708	0.02301335335
10	0.07064342499	0.01925086975
Average	0.1310348511	0.01191916466

For 8 Cities

Nth test	Genetic Algorithm	Hill Climbing
1	0.04308223724	0.007791996002
2	0.03619194031	0.009531021118
3	0.04477500916	0.006506919861
4	0.03736019135	0.01026535034
5	0.03750324249	0.01096820831
6	0.02763271332	0.02067255974
7	0.01790523529	0.01884436607
8	0.01780986786	0.01771807671
9	0.03719329834	0.01679897308
10	0.1150369644	0.0229575634
Average	0.04144906998	0.01420550346

Averages:

Average	Genetic	Hill Climbing	Simulated Annealing
20 City	0.1195716858	0.1349229097	0.7049300432
16 City	0.1310348511	0.01191916466	0.7049300432
8 City	0.04144906998	0.01420550346	0.7049300432

Findings:
It has been observed that simulated annealing and hill climbing are better suited for an input with small input size, but when the input size is larger the beauty of genetic algorithms starts to shine.

Simulated Annealing and Hill Climbing are often better suited for small input sizes due to their efficient exploration of simpler solution spaces. These algorithms excel in quickly finding local optima or satisfactory solutions, primarily focusing on making incremental improvements to the current solution without considering the broader solution space.

However, as the input size increases, the solution space becomes more complex. This complexity poses challenges for Simulated Annealing and Hill Climbing, as their local search strategies may struggle to effectively navigate through larger solution spaces and find globally optimal or near-optimal solutions.

In contrast, the Genetic Algorithm shines in larger input sizes due to its scalability and ability to handle complex solution spaces. Rather than focusing solely on local improvements, the Genetic Algorithm maintains solution diversity through the evolution of candidate solutions. This diversity allows it to explore a broader range of possibilities and effectively search through the vast solution space of larger optimization problems, such as the Traveling Salesman Problem.