

Tiempos de Ejecución de TSP

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Grupo B

Nota Importante: Se debe tener en cuenta que muchos algoritmos se basan en la aleatoriedad. Por tanto, es posible que muchos de ellos puedan dar mejores o peores soluciones a las que dieron cuando se testearon para el presente informe.

Nota Importante II: Como en clase se tuvo de referencia “tsp_400_1”, se ha optado por medir los tiempos hasta dicho punto.

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
2-Aproximation	tsp_5_1	4.00	0 1 2 3 4 0	1ms
	tsp_51_1	627.08	0 33 5 2 28 45 9 10 22 1 25 20 37 21 29 42 11 40 18 16 44 15 38 14 19 7 43 26 6 36 12 30 34 24 41 27 8 4 46 3 23 35 13 47 31 39 50 48 32 17 49 0	10ms
	tsp_70_1	874.58	0 35 57 2 23 56 27 30 21 49 58 33 65 47 63 34 69 50 11 1 22 14 44 16 24 46 55 68 51 7 5 40 6 52 38 36 41 66 37 42 62 48 54 64 60 13 19 53 32 8 43 4 25 9 3 59 61 10 67 18 26 12 31 20 29 28 15 45 39 17 0	36ms
	tsp_76_1	694.22	0 46 69 5 40 11 55 62 16 33 19 47 75 26 48 14 51 20 72 44 45 7 71 13 64 6 66 9 8 58 73 32 21 31 57 74 30 67 35 65 23 34 70 24 53 10 61 60 17 38 4 2 3 25 59 22 39 42 52 18 50 15 28 37 36 29 43 12 54 1 49 41 63 56 27 68 0	60ms
	tsp_76_2	139777.08	Vector demasiado largo para ser representado en la tabla	33ms
	tsp_99_1	1699.57		29ms
	tsp_100_1	839.56		44ms

	tsp_100_2	27110.16		50ms
	tsp_100_3	27640.70		80ms
	tsp_100_4	28219.73		56ms
	tsp_100_5	30094.67		56ms
	tsp_100_6	10855.29		55ms
	tsp_101_1	839.56		63ms
	tsp_105_1	19394.96		56ms
	tsp_107_1	59051.97		36ms
	tsp_124_1	79026.33		84ms
	tsp_127_1	157244.31		82ms
	tsp_136_1	144423.17		100ms
	tsp_144_1	75415.05		172ms
	tsp_150_1	35558.62		134ms
	tsp_150_2	36180.43		178ms
	tsp_152_1	84689.07		183ms
	tsp_159_1	55118.91		190ms
	tsp_195_1	3383.40		233ms
	tsp_198_1	19288.25		335ms
	tsp_200_1	40810.81		343ms
	tsp_200_2	40773.31		301ms
	tsp_225_1	178426.83		218ms
	tsp_226_1	116134.58		218ms
	tsp_262_1	3287.63		480ms
	tsp_264_1	65105.15		511ms
	tsp_299_1	64312.86		568ms

	tsp_318_1	58291.86		640ms
	tsp_318_2	58291		764ms
	tsp_400_1	20222.33		867ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
opt_2 (2-Aprox)	tsp_5_1	4.00	0 1 2 3 4 0	0ms
	tsp_51_1	532.65	0 10 9 45 28 2 5 47 27 3 46 8 13 35 4 34 24 41 23 30 12 36 6 26 33 22 1 20 37 7 19 40 18 16 14 44 15 38 29 42 11 21 43 50 39 25 31 48 32 17 49 0	8ms
	tsp_70_1	782.69	0 69 34 63 47 65 33 49 58 21 27 30 56 23 2 57 35 50 11 1 22 14 45 28 29 15 20 31 12 18 67 26 3 59 9 10 61 4 25 43 32 8 48 64 54 62 19 13 60 53 42 37 66 41 36 38 52 6 40 5 7 51 55 68 46 24 16 44 39 17 0	14ms
	tsp_76_1	630.47	Vector demasiado largo para ser representado en la tabla	64ms
	tsp_76_2	132895.42		24ms
	tsp_99_1	1471.29		31ms
	tsp_100_1	685.56		63ms
	tsp_100_2	25011.65		50ms
	tsp_100_3	24364.12		46ms
	tsp_100_4	24281.44		51ms
	tsp_100_5	26076.75		36ms
	tsp_100_6	9663.71		44ms
	tsp_101_1	685.56		98ms
	tsp_105_1	16759.20		45ms
	tsp_107_1	52123.23		31ms

	tsp_124_1	66699.24		73ms
	tsp_127_1	141316.25		95ms
	tsp_136_1	118397.37		194ms
	tsp_144_1	70326.34		80ms
	tsp_150_1	32360.55		123ms
	tsp_150_2	32036.10		91ms
	tsp_152_1	79709.32		171ms
	tsp_159_1	46964.70		151ms
	tsp_195_1	2728.23		202ms
	tsp_198_1	17684.99		164ms
	tsp_200_1	34757.32		213ms
	tsp_200_2	35258.10		411ms
	tsp_225_1	150136.07		146ms
	tsp_226_1	95557.19		162ms
	tsp_262_1	2836.42		325ms
	tsp_264_1	56177.41		704ms
	tsp_299_1	57888.64		471ms
	tsp_318_1	50398.26		504ms
	tsp_318_2	50398.26		597ms
	tsp_400_1	17550.49		718ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
opt_3 (2-Aprox)	tsp_5_1	4.00	0 1 2 3 4 0	0ms
	tsp_51_1	448.35	0 48 32 17 49 39 50 43 21 37 20 25 36 6 26 1 31 22 33 47 27 41 24 34 23 12 30 11 42 29 38 15 14 44 16 18 40 19 7 13 35 4 8 46 3 45 9 10 28 2 5 0	957ms
	tsp_70_1	712.52	0 1 22 14 15 20 29 28 45 12 31 67 18 26 3 59 9 25 4 10 61 43 32 8 64 54 48 37 66 42 62 13 19 60 53 41 36 38 52 6 40 5 7 51 55 68 46 24 16 44 39 17 11 50 35 57 2 23 56 30 27 21 58 49 69 34 33 65 47 63 0	2188ms
	tsp_76_1	585.00	Vector demasiado largo para ser representado en la tabla	3668ms
	tsp_76_2	113624.10		3068ms
	tsp_99_1	1293.09		6131ms
	tsp_100_1	668.05		7493ms
	tsp_100_2	24022.67		6580ms
	tsp_100_3	22478.31		8688ms
	tsp_100_4	22931.64		7285ms
	tsp_100_5	24378.64		7514ms
	tsp_100_6	8493.56		8198ms
	tsp_101_1	668.05		10169ms
	tsp_105_1	15397.25		8703ms
	tsp_107_1	46973.15		7082ms
	tsp_124_1	60896.73		14569ms
	tsp_127_1	130829.10		15278ms
	tsp_136_1	103266.35		25264ms
	tsp_144_1	62812.08		25261ms

	tsp_150_1	28938.36		29564ms
	tsp_150_2	27744.74		28095ms
	tsp_152_1	74778.75		31751ms
	tsp_159_1	44287.30		40687ms
	tsp_195_1	2448.53		63667ms
	tsp_198_1	16639.78		63465ms
	tsp_200_1	32847.49		65437ms
	tsp_200_2	31287.66		46417ms
	tsp_225_1	135809.77		74035ms
	tsp_226_1	87291.77		85352ms
	tsp_262_1	2601.06		163168ms
	tsp_264_1	54810.00		280208ms
	tsp_299_1	52191.67		248971ms
	tsp_318_1	46113.27		303813ms
	tsp_318_2	46113.27		262879ms
	tsp_400_1	16612.33		446299ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
Christofides	tsp_5_1	4.00	0 1 2 3 4 0	0ms
	tsp_51_1	475.41	0 33 22 31 39 50 38 15 44 14 16 18 40 19 7 11 42 29 43 21 37 20 25 1 48 49 17 32 26 47 6 36 12 30 34 23 35 13 4 8 24 41 27 46 3 10 9 45 28 2 5 0	51ms
	tsp_70_1	775.68	0 35 50 11 1 22 14 44 16 24 46 67 18 12 31 45 28 29 20 15 26 25 4 61 10 9 59 3 43 51 7 32 8 64 54 48 62 42 60 13 19 37 66 41 53 36 38 52 6 40 5 55 68	146ms

			39 17 30 27 21 49 58 56 23 2 33 69 34 63 47 65 57 0	
	tsp_76_1	601.59	Vector demasiado largo para ser representado en la tabla	201ms
	tsp_76_2	117154.28		82ms
	tsp_99_1	1327.17		203ms
	tsp_100_1	701.42		351ms
	tsp_100_2	23649.26		213ms
	tsp_100_3	23164.69		351ms
	tsp_100_4	23546.66		201ms
	tsp_100_5	23532.58		362ms
	tsp_100_6	9138.68		472ms
	tsp_101_1	701.42		548ms
	tsp_105_1	16585.16		249ms
	tsp_107_1	48143.87		158ms
	tsp_124_1	63059.14		323ms
	tsp_127_1	130391.68 1		578ms
	tsp_136_1	105832.48		268ms
	tsp_144_1	69076.15		273ms
	tsp_150_1	28840.82		1033ms
	tsp_150_2	29905.29		913ms
	tsp_152_1	76212.99		193ms
	tsp_159_1	45699.29		668ms
	tsp_195_1	2543.65		899ms
	tsp_198_1	17294.49		1101ms
	tsp_200_1	32184.15		1963ms

	tsp_200_2	32524.23		957ms
	tsp_225_1	133556.35		235ms
	tsp_226_1	91203.57		894ms
	tsp_262_1	2656.08		2417ms
	tsp_264_1	52492.73		1575ms
	tsp_299_1	52999.93		3823ms
	tsp_318_1	47281.04		4404ms
	tsp_318_2	47281.04		3250ms
	tsp_400_1	17007.51		9948ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
Opt_2 (Christofides)	tsp_5_1	4.00	0 1 2 3 4 0	0ms
	tsp_51_1	452.37	0 32 17 49 48 39 50 38 15 14 44 16 18 7 19 40 11 42 29 43 21 37 20 25 1 31 22 33 47 26 6 36 30 12 34 23 35 13 4 8 24 41 27 3 46 45 9 10 28 2 5 0	14ms
	tsp_70_1	749.41	0 35 50 11 1 22 14 44 16 68 55 5 40 6 52 38 36 53 41 66 37 42 60 19 13 62 48 54 64 8 32 7 51 43 61 10 9 59 3 4 25 26 46 24 67 18 12 31 45 28 29 20 15 39 17 30 58 49 21 27 56 23 65 33 69 34 63 47 2 57 0	18ms
	tsp_76_1	575.00	Vector demasiado largo para ser representado en la tabla	28ms
	tsp_76_2	112353.70		18ms
	tsp_99_1	1279.05		37ms
	tsp_100_1	677.74		45ms
	tsp_100_2	22607.23		48ms
	tsp_100_3	21843.69		76ms

	tsp_100_4	22474.47		39ms
	tsp_100_5	22374.83		40ms
	tsp_100_6	8541.34		52ms
	tsp_101_1	677.74		44ms
	tsp_105_1	16013.89		44ms
	tsp_107_1	45531.83		46ms
	tsp_124_1	59281.77		115ms
	tsp_127_1	123258.54		50ms
	tsp_136_1	102316.58		100ms
	tsp_144_1	66517.21		106ms
	tsp_150_1	27206.95		102ms
	tsp_150_2	27963.31		118ms
	tsp_152_1	74999.71		80ms
	tsp_159_1	44377.56		170ms
	tsp_195_1	2466.24		127ms
	tsp_198_1	16507.24		127ms
	tsp_200_1	30934.60		176ms
	tsp_200_2	30947.91		124ms
	tsp_225_1	130182.85		184ms
	tsp_226_1	83859.21		201ms
	tsp_262_1	2548.85		204ms
	tsp_264_1	51407.82		459ms
	tsp_299_1	50607.72		446ms
	tsp_318_1	44937.30		490ms
	tsp_318_2	44937.30		397ms

	tsp_400_1	16309.11		595ms
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Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
Opt_3 (Christofides)	tsp_5_1	4.00	0 1 2 3 4 0	0ms
	tsp_51_1	439.29	0 5 2 28 10 9 45 27 3 46 41 24 8 4 13 35 23 34 12 30 36 6 47 26 1 25 20 37 21 43 29 42 11 40 7 19 18 16 44 14 15 38 50 39 49 17 32 48 31 22 33 0	1203ms
	tsp_70_1	691.26	0 57 2 47 63 34 69 65 33 23 56 27 30 17 39 44 16 24 67 46 68 55 51 7 5 40 6 52 38 36 21 49 58 53 41 66 37 42 60 19 13 62 48 54 64 8 32 43 61 10 4 25 9 59 3 26 18 12 31 45 28 29 20 15 14 22 1 11 50 35 0	2952ms
	tsp_76_1	568.12	Vector demasiado largo para ser representado en la tabla	4055ms
	tsp_76_2	112312.64		2907ms
	tsp_99_1	1264.61		6164ms
	tsp_100_1	666.14		9816ms
	tsp_100_2	22607.23		7923ms
	tsp_100_3	21201.40		8966ms
	tsp_100_4	21728.25		9158ms
	tsp_100_5	22245.11		7302ms
	tsp_100_6	8257.95		8027ms
	tsp_101_1	666.14		8705ms
	tsp_105_1	15600.80		8195ms
	tsp_107_1	45077.09		6899ms
	tsp_124_1	59569.19		14948ms
	tsp_127_1	124487.92		15928ms

	tsp_136_1	101573.53		18631ms
	tsp_144_1	62374.05		26993ms
	tsp_150_1	26987.61		25412ms
	tsp_150_2	27056.34		29500ms
	tsp_152_1	74340.48		30658ms
	tsp_159_1	43588.96		36850ms
	tsp_195_1	2453.24		60681ms
	tsp_198_1	16243.86		66852ms
	tsp_200_1	30559.05		72894ms
	tsp_200_2	30357.53		44809ms
	tsp_225_1	128535.01		73730ms
	tsp_226_1	82877.22		100595ms
	tsp_262_1	2515.09		151952ms
	tsp_264_1	50729.72		223307ms
	tsp_299_1	49442.70		234674ms
	tsp_318_1	44148.98		293647ms
	tsp_318_2	44148.98		220471ms
	tsp_400_1	15914.99		537220ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
SA (Christofides)	tsp_5_1	4.00	0 1 2 3 4 0	2777ms
	tsp_51_1	447.22	0 33 32 48 17 49 39 50 38 15 14 44 16 18 19 7 40 11 42 29 43 21 37 20 25 1 31 22 47 26 6 36 30 12 34 23 35 13 4 8 24 46 3 41 27 45 9 10 28 2 5 0	3554ms

	tsp_70_1	713.97	0 35 50 11 1 22 14 15 20 29 28 45 31 12 18 26 25 3 59 9 10 61 4 43 51 7 32 8 64 54 48 62 42 13 19 60 53 36 41 66 37 38 52 6 40 5 55 68 46 67 24 16 44 39 17 30 27 56 23 21 58 49 69 34 63 47 65 33 2 57 0	3455ms
	tsp_76_1	577.59	Vector demasiado largo para ser representado en la tabla	4265ms
	tsp_76_2	111978.24		2810ms
	tsp_99_1	1274.25		3067ms
	tsp_100_1	726.20		1ms
	tsp_100_2	22744.78		2609ms
	tsp_100_3	21577.49		3508ms
	tsp_100_4	22480.49		3322ms
	tsp_100_5	22418.96		3183ms
	tsp_100_6	8292.26		3223ms
	tsp_101_1	705.11		1ms
	tsp_105_1	15568.80		3221ms
	tsp_107_1	46659.36		28ms
	tsp_124_1	59998.71		3228ms
	tsp_127_1	127481.05		74ms
	tsp_136_1	103575.40		2761ms
	tsp_144_1	64474.27		3768ms
	tsp_150_1	26806.84		3159ms
	tsp_150_2	27506.13		3535ms
	tsp_152_1	74596.96		4099ms
	tsp_159_1	43749.71		603ms
	tsp_195_1	2455.65		3365ms

	tsp_198_1	16574.49		433ms
	tsp_200_1	30313.31		3451ms
	tsp_200_2	30528.24		2276ms
	tsp_225_1	130509.58		72ms
	tsp_226_1	90538.68		9ms
	tsp_262_1	2511.01		5051ms
	tsp_264_1	51380.20		3664ms
	tsp_299_1	51453.43		506ms
	tsp_318_1	44933.03		3295ms
	tsp_318_2	44567.34		2429ms
	tsp_400_1	16163.35		2921ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
tabu_annealing (Christofides)	tsp_5_1	4.00	0 1 2 3 4 0	3082ms
	tsp_51_1	446.53	0 33 32 17 49 48 22 31 39 50 38 15 14 44 16 18 7 19 40 11 42 29 43 21 37 20 25 1 26 47 6 36 30 12 34 23 35 13 4 8 24 41 46 3 27 45 9 10 28 2 5 0	4634ms
	tsp_70_1	734.85	0 35 50 11 1 22 14 44 16 55 68 46 24 15 20 29 28 45 12 31 67 18 26 25 3 59 9 10 61 4 43 51 7 32 8 64 54 48 13 19 60 42 62 37 66 41 53 36 38 52 6 5 40 39 17 30 27 21 58 49 23 56 2 65 33 69 34 63 47 57 0	7013ms
	tsp_76_1	567.14	Vector demasiado largo para ser representado en la tabla	5172ms
	tsp_76_2	111685.36		3450ms
	tsp_99_1	1268.91		3476ms
	tsp_100_1	670.88		5034ms

	tsp_100_2	22827.61		3695ms
	tsp_100_3	21647.86		4913ms
	tsp_100_4	22307.55		4416ms
	tsp_100_5	22281.21		4190ms
	tsp_100_6	8399.49		4514ms
	tsp_101_1	670.19		4614ms
	tsp_105_1	15626.15		3554ms
	tsp_107_1	45148.58		72ms
	tsp_124_1	59663.23		4546ms
	tsp_127_1	123346.03		4634ms
	tsp_136_1	103313.18		3891ms
	tsp_144_1	67736.63		178ms
	tsp_150_1	27011.42		3935ms
	tsp_150_2	28051.26		4608ms
	tsp_152_1	74863.76		3500ms
	tsp_159_1	43590.55		1047ms
	tsp_195_1	2458.88		4520ms
	tsp_198_1	16710.35		589ms
	tsp_200_1	30614.04		4719ms
	tsp_200_2	30360.41		3421ms
	tsp_225_1	129368.41		722ms
	tsp_226_1	90739.29		3ms
	tsp_262_1	2501.29		6072ms
	tsp_264_1	51008.66		5102ms
	tsp_299_1	50599.47		1169ms

	tsp_318_1	44741.21		4659ms
	tsp_318_2	44548.26		3431ms
	tsp_400_1	16105.31		4890ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
genetic_cycle (Christofides)	tsp_5_1	4.00	0 1 2 3 4 0	0ms
	tsp_51_1	455.20	0 33 32 17 49 48 39 50 38 15 14 44 16 18 19 7 40 11 42 29 43 21 37 20 25 1 31 22 26 47 6 36 30 12 34 23 35 13 4 8 24 46 3 41 27 45 9 10 28 2 5 0	0ms
	tsp_70_1	1710.29	0 35 50 11 1 22 14 15 16 29 68 45 24 12 20 26 28 3 59 31 10 18 4 25 51 7 9 8 61 54 43 62 42 32 19 64 53 48 13 66 60 38 52 37 40 41 55 36 46 67 6 5 44 39 17 30 27 21 58 49 23 56 69 34 63 47 65 33 2 57 0	0ms
	tsp_76_1	819.20	Vector demasiado largo para ser representado en la tabla	1ms
	tsp_76_2	111859.32		1ms
	tsp_99_1	1406.63		1ms
	tsp_100_1	794.29		0ms
	tsp_100_2	22930.69		2ms
	tsp_100_3	22790.13		0ms
	tsp_100_4	32396.83		0ms
	tsp_100_5	22281.21		1ms
	tsp_100_6	8453.18		1ms
	tsp_101_1	876.25		1ms
	tsp_105_1	15626.15		1ms

	tsp_107_1	47063.62		1ms
	tsp_124_1	72621.52		1ms
	tsp_127_1	373157.47		1ms
	tsp_136_1	387155.74		0ms
	tsp_144_1	115659.05		1ms
	tsp_150_1	34912.16		2ms
	tsp_150_2	27582.67		3ms
	tsp_152_1	74979.26		1ms
	tsp_159_1	43749.71		1ms
	tsp_195_1	2495.68		1ms
	tsp_198_1	43313.67		1ms
	tsp_200_1	39292.32		0ms
	tsp_200_2	30562.94		1ms
	tsp_225_1	431373.37		3ms
	tsp_226_1	91934.48		1ms
	tsp_262_1	5346.67		4ms
	tsp_264_1	52885.60		3ms
	tsp_299_1	55142.52		4ms
	tsp_318_1	55483.94		8ms
	tsp_318_2	44894.83		2ms
	tsp_400_1	40854.06		11ms

Algoritmo	Entrada	Salida	Vector Elementos	Tiempo [Ms]
ant_algorithm	tsp_5_1	4.00	0 1 2 3 4 0	2ms
	tsp_51_1	740.38	0 5 2 20 25 50 11 37 21 43 39 49 48 31 22 17 32 33 47 26 6 1 42 29 44 15 16 18 38 14 7 23 34 12 36 4 24 35 40 19 41 27 28 45 9 10 46 3 8 13 30 0	42409ms
	tsp_70_1	1085.40	0 34 63 47 65 33 23 57 11 1 22 50 69 27 56 30 21 49 58 42 62 37 32 8 54 64 48 60 66 41 36 53 6 52 38 40 5 7 51 25 4 10 61 9 59 3 43 19 13 2 14 16 20 15 67 18 26 12 28 31 29 45 55 68 46 24 44 39 17 35 0	176204ms
	tsp_76_1	919.82	Vector demasiado largo para ser representado en la tabla	248684ms
	tsp_76_2	338422.68		77547ms
	tsp_99_1			Más de 5 minutos