

```
>> fa_tsp_chk_nt
```

```
time =
```

```
274.6826
```

```
route
```

```
Columns 1 through 17
```

```
      47      91      98      23      45      15      17      59      36      99      38      24      18      94  
88      16      22
```

```
Columns 18 through 34
```

```
      70      66      26      65      4      97      56      80      31      89      42      8      92      67  
25      81      69
```

```
Columns 35 through 51
```

```
      64      40      54      2      44      73      68      85      50      82      95      13      76      35  
37      5      52
```

```
Columns 52 through 68
```

```
      78      96      39      30      48     100      41      71      14      3      43      46      29      34  
83      55      7
```

```
Columns 69 through 85
```

```
      20      12      27      86      35      62      60      77      57      9      87      51      61      56  
28      93      1
```

```
Columns 86 through 100
```

```
      63      6      49      75      19      53      79      90      10      84      72      21      74      14  
32
```

```
distance
```

```
23203
```

```
difference from optimum solution
```

```
1921
```

```
percentage error :
```

```
9.0264
```

```
run =
```

```
1
```

time =

274.0274

route

Columns 1 through 16

53	19	75	90	10	84	24	38	99	36	72	21	74	<del>54</del>
17	15												

Columns 17 through 32

11	32	47	91	45	98	23	77	60	62	35	86	27	<del>12</del>
20	7												

Columns 33 through 48

55	83	34	29	46	43	3	14	71	41	100	48	30	<del>39</del>
96	78												

Columns 49 through 64

52	5	37	33	76	13	95	82	50	44	2	54	40	<del>64</del>
73	68												

Columns 65 through 80

85	9	57	87	51	61	25	81	69	58	67	28	93	<del>41</del>
63	6												

Columns 81 through 96

49	92	8	42	89	31	80	56	97	4	65	26	66	<del>70</del>
22	88												

Columns 97 through 100

16	94	18	79
----	----	----	----

distance

22431

difference from optimum solution

1149

percentage error :

5.3989

run =

2

time =

273.5303

route

Columns 1 through 16

10	90	49	6	63	47	72	21	74	59	17	15	11	<del>32</del>
45	91												

Columns 17 through 32

98	23	77	60	62	35	86	27	20	12	55	83	34	<del>29</del>
46	43												

Columns 33 through 48

3	14	71	41	100	48	30	96	78	52	5	37	33	<del>76</del>
13	95												

Columns 49 through 64

82	39	85	68	73	50	44	2	54	40	64	69	81	<del>25</del>
87	9												

Columns 65 through 80

7	57	51	61	58	67	28	93	1	92	8	42	89	<del>31</del>
80	56												

Columns 81 through 96

97	75	19	4	65	26	66	70	22	94	16	88	53	<del>74</del>
18	24												

Columns 97 through 100

38	99	36	84
----	----	----	----

distance

21498

difference from optimum solution

216

percentage error :

1.0149

run =

3

time =

279.4742

route

Columns 1 through 16

35	86	20	62	60	77	23	98	91	45	15	17	11	<del>32</del>
47	63												

Columns 17 through 32

6	49	75	19	53	79	90	10	84	72	21	74	59	<del>36</del>
99	38												

Columns 33 through 48

24	18	94	88	16	22	70	66	26	65	4	97	56	<del>80</del>
31	89												

Columns 49 through 64

42	8	92	1	93	28	67	58	61	51	25	81	69	<del>73</del>
68	85												

Columns 65 through 80

50	44	64	40	54	2	82	95	13	76	33	37	5	<del>52</del>
78	96												

Columns 81 through 96

39	30	48	100	71	41	14	29	3	43	46	34	83	<del>56</del>
7	9												

Columns 97 through 100

87	57	12	27
----	----	----	----

distance

22151

difference from optimum solution

869

```
percentage error :  
    4.0833
```

```
run =
```

```
    4
```

```
time =
```

```
280.9316
```

```
route
```

```
Columns 1 through 16
```

```
    2    44    82    95    13    76    33    37    5    96    78    52    48    100  
41    71
```

```
Columns 17 through 32
```

```
    14     3    43    46    29    34    83    55     7     9    87    57    20    12  
27    86
```

```
Columns 33 through 48
```

```
    35    62    60    77    23    98    45    91    47    32    11    15    17    54  
74    21
```

```
Columns 49 through 64
```

```
    72    10    84    36    99    38    24    18    79    94    22    70    16    84  
53    90
```

```
Columns 65 through 80
```

```
    49     6    75    19    66    26    65     4    97    56    80    31    89    42  
8     92
```

```
Columns 81 through 96
```

```
    63     1    93    28    67    58    61    51    25    81    68    85    30    34  
50    73
```

```
Columns 97 through 100
```

```
    69    64    40    54
```

```
distance
```

```
22345
```

difference from optimum solution  
1063

percentage error :  
4.9948

run =

5

time =

281.7170

route

Columns 1 through 16

	47	93	28	67	58	61	69	64	40	54	2	44	82	<del>96</del>
13	76													

Columns 17 through 32

	33	37	5	78	52	96	30	39	85	68	50	73	81	<del>26</del>
51	87													

Columns 33 through 48

	57	9	7	34	29	14	48	100	71	41	3	43	46	<del>83</del>
55	12													

Columns 49 through 64

	20	27	86	35	62	60	77	23	98	91	45	32	11	<del>16</del>
17	59													

Columns 65 through 80

	74	21	72	10	84	36	99	38	24	18	79	90	19	<del>54</del>
88	16													

Columns 81 through 96

	94	22	70	66	26	65	4	75	97	56	80	31	89	<del>42</del>
8	92													

Columns 97 through 100

1	49	6	63
---	----	---	----

82 50 85 68 73 44 2 54 40 64 69 81 25 87

Columns 97 through 100

58 93 28 67

distance

22044

difference from optimum solution

762

percentage error :

3.5805

run =

7

time =

281.1386

route

Columns 1 through 16

	64	69	73	85	68	50	44	2	82	95	13	76	33	<del>34</del>
5	52													

Columns 17 through 32

	78	96	39	30	48	100	41	71	14	3	43	46	29	<del>34</del>
83	55													

Columns 33 through 48

	7	9	81	25	61	51	87	57	20	12	27	86	35	<del>62</del>
60	77													

Columns 49 through 64

	23	98	91	45	32	47	11	15	17	59	74	21	72	<del>14</del>
84	36													

Columns 65 through 80

	99	38	24	18	94	16	88	22	70	66	26	65	4	<del>94</del>
75	19													

Columns 81 through 96



44 47 93 28 67 58 61 51 25 81 69 64 40 54 

Columns 81 through 96

	73	68	85	39	82	95	13	76	33	37	5	52	78	<del>96</del>
30	48													

Columns 97 through 100

100	41	71	14
-----	----	----	----

distance

22108

difference from optimum solution

826

percentage error :

3.8812

run =

9

time =

281.8485

route

Columns 1 through 16

	29	34	83	55	12	7	9	57	20	27	86	35	62	<del>64</del>
77	23													

Columns 17 through 32

	98	45	91	47	32	11	15	17	59	74	21	72	10	<del>84</del>
36	99													

Columns 33 through 48

	38	24	18	79	53	88	16	94	22	70	66	26	65	<del>4</del>
97	75													

Columns 49 through 64

	19	90	49	6	63	1	92	8	56	80	31	89	42	<del>67</del>
28	93													

Columns 65 through 80

```

    58    61    51    87    25    81    69    73    68    85    50    44    64    40
54      2

```

Columns 81 through 96

```

    82    95    13    76    33    37    5    52    78    96    39    30    48    1004
41    71

```

Columns 97 through 100

```

    14     3    43    46

```

```

distance
    21937

```

```

difference from optimum solution
    655

```

```

percentage error :
    3.0777

```

```

run =

    10

```

```

time =

    281.3303

```

```

route
Columns 1 through 16

```

```

    18    79    88    16    94    22    70    53    19    75    97    4    65    66
26    56

```

Columns 17 through 32

```

    80    31    89    42     8    92     6    49    90    63     1    93    28    67
58    61

```

Columns 33 through 48

```

    51    25    81    69    73    68    85    50    44    64    40    54     2    82
95    13

```

Columns 49 through 64

```

    76    33    37     5    52    78    96    39    30    48    100    41    71    14

```

[illegible]

Columns 49 through 64

	18	24	38	99	36	84	10	72	21	74	59	17	15	<del>14</del>
32	45													

Columns 65 through 80

	23	98	91	47	93	28	58	61	81	25	51	87	9	<del>47</del>
57	20													

Columns 81 through 96

	77	60	62	35	86	27	12	55	83	34	29	46	43	<del>43</del>
41	71													

Columns 97 through 100

100	48	14	30
-----	----	----	----

distance

22346

difference from optimum solution

1064

percentage error :

4.9995

run =

12

time =

280.9552

route

Columns 1 through 16

	47	1	63	6	49	19	75	92	8	42	89	31	80	<del>56</del>
97	4													

Columns 17 through 32

	65	26	66	70	22	94	16	88	53	79	90	10	84	<del>14</del>
24	38													

Columns 33 through 48

```
    99    36    72    21    74    59    17    15    11    32    91    45    60    62
35     86
```

Columns 49 through 64

```
    27    55    83    34    29    46    43     3    14    71    41   100    48    34
39     96
```

Columns 65 through 80

```
    78    52     5    37    33    76    13    95    82    85    68    25    81    64
73     50
```

Columns 81 through 96

```
    44     2    54    40    64    67    28    93    58    61    51    87    57    49
7      12
```

Columns 97 through 100

```
    20    77    23    98
```

distance

```
    23024
```

difference from optimum solution

```
    1742
```

percentage error :

```
    8.1853
```

run =

```
    13
```

time =

```
    282.2559
```

route

Columns 1 through 16

```
    61    51    87    25    81    69    64    40    54     2    44    73    68    85
50     82
```

Columns 17 through 32

```
    95    13    76    33    37     5    52    78    96    39    30    48   100    41
71     14
```

Columns 33 through 48

	3	43	46	29	34	83	55	9	7	57	20	12	27	<del>86</del>
35	62													

Columns 49 through 64

	60	77	23	98	45	91	47	32	11	17	15	59	74	<del>24</del>
72	10													

Columns 65 through 80

	84	36	99	38	24	18	79	94	22	70	16	88	53	<del>94</del>
49	6													

Columns 81 through 96

	63	75	19	4	65	66	26	97	56	80	31	89	42	<del>48</del>
92	1													

Columns 97 through 100

93	28	67	58
----	----	----	----

distance

22005

difference from optimum solution

723

percentage error :

3.3972

run =

14

time =

282.2487

route

Columns 1 through 16

	69	81	25	61	58	93	28	67	89	42	31	80	56	<del>94</del>
4	65													

Columns 17 through 32

```
      26      66      70      22      94      16      88      53      19      75      8      92      1      63
6      49
```

Columns 33 through 48

```
      90      79      18      24      38      99      36      84      10      72      21      74      59      12
15      11
```

Columns 49 through 64

```
      32      47      91      45      98      23      77      60      62      35      86      27      12      20
57      51
```

Columns 65 through 80

```
      87      9      7      55      83      34      29      46      43      3      14      71      41      100
48      30
```

Columns 81 through 96

```
      39      96      52      78      5      37      33      76      13      95      82      50      85      64
73      44
```

Columns 97 through 100

```
      2      54      40      64
```

distance

```
21996
```

difference from optimum solution

```
714
```

percentage error :

```
3.3549
```

run =

```
15
```

time =

```
284.1220
```

route

Columns 1 through 16

```
      83      34      29      30      39      85      68      50      73      81      25      87      9      17
```



57      20

Columns 17 through 32

12	27	86	35	62	60	23	98	91	45	32	47	11	<del>15</del>
17	59												

Columns 33 through 48

74	21	72	10	84	36	99	38	24	18	94	79	53	<del>85</del>
16	22												

Columns 49 through 64

70	66	26	65	4	97	56	75	19	90	49	6	63	<del>41</del>
92	8												

Columns 65 through 80

42	80	31	89	67	28	93	58	77	51	61	69	64	<del>40</del>
54	2												

Columns 81 through 96

44	82	95	13	76	33	37	5	96	78	52	48	100	<del>41</del>
71	14												

Columns 97 through 100

3	43	46	55
---	----	----	----

distance

23347

difference from optimum solution

2065

percentage error :

9.7030

run =

16

time =

281.1708

route

Columns 1 through 16

73	81	25	61	51	87	57	9	7	34	83	55	12	<del>24</del>
35	86												

Columns 17 through 32

20	62	60	77	23	98	45	91	47	32	11	15	17	<del>54</del>
74	21												

Columns 33 through 48

72	10	84	36	99	38	24	18	79	53	88	16	94	<del>24</del>
70	66												

Columns 49 through 64

26	65	4	97	75	19	90	49	6	63	92	56	80	<del>34</del>
89	42												

Columns 65 through 80

8	1	93	28	67	58	69	64	40	54	2	44	50	<del>84</del>
95	13												

Columns 81 through 96

76	33	37	5	96	78	52	48	100	41	71	14	3	<del>44</del>
46	29												

Columns 97 through 100

30	39	85	68
----	----	----	----

distance

22178

difference from optimum solution

896

percentage error :

4.2101

run =

17

time =

282.9782

route

Columns 1 through 16

28	67	58	61	51	87	25	81	68	85	50	44	73	<del>64</del>
64	40												

Columns 17 through 32

54	2	82	95	13	76	33	37	5	52	78	96	39	<del>30</del>
48	100												

Columns 33 through 48

41	71	14	3	43	46	29	34	83	55	7	9	57	<del>20</del>
12	27												

Columns 49 through 64

86	35	62	60	77	23	98	91	45	32	11	15	17	<del>54</del>
74	21												

Columns 65 through 80

72	10	84	36	99	38	24	18	79	53	88	16	94	<del>22</del>
70	66												

Columns 81 through 96

26	65	4	97	56	80	31	89	42	8	1	92	75	<del>14</del>
90	49												

Columns 97 through 100

6	63	47	93
---	----	----	----

distance

21624

difference from optimum solution

342

percentage error :

1.6070

run =

18

time =

283.8054

route

Columns 1 through 16

39	82	95	13	76	33	37	5	96	78	52	48	100	<del>41</del>
71	14												

Columns 17 through 32

3	43	46	29	34	83	55	7	9	87	57	20	12	<del>21</del>
35	86												

Columns 33 through 48

62	60	77	23	98	91	45	32	11	15	17	74	59	<del>21</del>
72	36												

Columns 49 through 64

99	38	24	18	84	10	90	6	49	63	75	19	53	<del>74</del>
94	88												

Columns 65 through 80

16	22	70	66	26	65	4	97	56	80	31	89	42	<del>46</del>
92	1												

Columns 81 through 96

47	93	28	67	58	61	51	25	81	69	64	40	54	<del>42</del>
44	50												

Columns 97 through 100

73	68	85	30
----	----	----	----

distance

22030

difference from optimum solution

748

percentage error :

3.5147

run =

19

time =

283.5776

route

Columns 1 through 16

22	70	16	88	53	79	90	10	84	72	47	63	6	<del>49</del>
75	19												

Columns 17 through 32

4	65	66	26	97	56	80	31	89	42	8	92	1	<del>93</del>
28	67												

Columns 33 through 48

58	61	51	87	57	9	25	81	69	64	40	54	2	<del>44</del>
50	73												

Columns 49 through 64

68	85	30	39	82	95	13	76	33	37	5	96	78	<del>52</del>
48	100												

Columns 65 through 80

41	71	14	3	43	46	29	34	83	55	7	20	12	<del>27</del>
86	35												

Columns 81 through 96

62	60	77	23	98	91	45	32	11	15	17	59	74	<del>24</del>
36	99												

Columns 97 through 100

38	24	18	94
----	----	----	----

distance

22542

difference from optimum solution

1260

percentage error :

5.9205

```
run =
```

```
    20
```

```
avgTime =
```

```
280.7146
```

```
avgDist =
```

```
2.2306e+04
```

```
bestDist =
```

```
    21498
```

```
stdDeviation =
```

```
481.2747
```

```
>>
```