

New Solutions

We have currently solved some unsolved problems from QAPLIB to proven optimality

Instance: esc32c

(15, 12, 27, 13, 22, 8, 24, 23, 20, 19, 4, 2, 1, 7, 6, 3, 5, 18, 17, 21, 14, 29, 16, 32, 26, 11, 31, 30, 28, 10, 25, 9)

Considering the 13 rows (and columns) with all elements equal to zero in the flow matrix there are at least $13! = 6227020800$ optimal solutions.

(15, 12,*, 13, 22, 8, 24, 23, 20, 19, 4, 2, 1, 7, 6, 3, 5, 18, 17, 21,*,*,*,*,*,*,*,*,*,*)

where * is given by all permutations of the elements in the set S ,

$$S \in \{9, 10, 11, 14, 16, 25, 26, 27, 28, 29, 30, 31, 32\}$$

The (proven) optimal value 642 was obtained in about 8h on a single PC.

New Solutions...

Instance: esc32d

(18, 29, 10, 2, 25, 32, 22, 20, 24, 17, 30, 9, 1, 26, 31, 21, 19, 23, 27, 16, 13, 6, 3, 11, 15, 7, 8, 5, 14, 4, 12, 28)

Considering the 14 rows (and columns) with all elements equal to zero in the flow matrix there are at least $14! = 87178291200 \approx 10^{11}$ optimal solutions.

(18, 29, 10, 2, 25, 32, 22, 20, 24, 17, 30, 9, 1, 26, 31, 21, 19, 23, *, *, *, *, *, *, *, *, *, *, *)

where * is given by all permutations of the elements in the set S ,

$$S \in \{3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16, 27, 28\}$$

The (proven) optimal value 200 was obtained in about 35h on a single PC.

New Solutions...

Instance: tai64c

(1,15,32,35,61,41,29,18,12,45,63,59,47,2,3,4,5,6,7,8,9,10,11,13,14,16,17,19,20,21,22,23,24,25,
26,27,28,30,31,33,34,36,37,38,39,40,42,43,44,46,48,49,50,51,52,53,54,55,56,57,58,60,62,64)

Considering the 51 rows (and columns) with all elements equal to zero in the flow matrix there are at least $51! \approx 1.55 \cdot 10^{66}$ optimal solutions.

(1,15,32,35,61,41,29,18,12,45,63,59,47,* ,...,*)

where * is given by all permutations of the elements in the set S ,

$S \in \{ 2,3,4,5,6,7,8,9,10,11,13,14,16,17,19,20,21,22,23,24,25,26,27,28,30,31,33,34,36,
37,38,39,40,42,43,44,46,48,49,50,51,52,53,54,55,56,57,58,60,62,64 \}$

The (proven) optimal value 1855928 was obtained in about 51h on a single PC.