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Home > **Operation Research calculators** > Primal to dual conversion calculator

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Algorithi

Method   6. Primal to Dual ▼

Solve the Linear programming problem using Primal to dual conversion calculator

Type your linear programming problem

```
MIN z = 12x12 + 13x13 + 14x14 + 21x21 + 23x23 + 24x24 +
31x31 + 32x32 + 34x34 + 41x41 + 42x42 + 43x43
subject to
x12 + x13 + x14 + x21 + x31 + x41 = 1
x12 + x21 + x23 + x24 + x32 + x42 = 1
x13 + x23 + x31 + x32 + x34 + x43 = 1
```

OR

Total Variables : 12   Total Constraints : 16   Generate

Min ▼ z = 12 x12 + 13 x13 + 14 x14 + 21 x21 + 23 x23 + 24 x24 + 31 x31 + 32 x32 + 34 x34 + 41 x41 + 4

Subject to constraints

	x12		x13		x14		x21		x23		x24		x31		x32		x34		x41		x42
1	x12 +	1	x13 +	1	x14 +	1	x21 +	0	x23 +	0	x24 +	1	x31 +	0	x32 +	0	x34 +	1	x41 +	0	x42 +
1	x12 +	0	x13 +	0	x14 +	1	x21 +	1	x23 +	1	x24 +	0	x31 +	1	x32 +	0	x34 +	0	x41 +	1	x42 +
0	x12 +	1	x13 +	0	x14 +	0	x21 +	1	x23 +	0	x24 +	1	x31 +	1	x32 +	1	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	1	x14 +	0	x21 +	0	x23 +	1	x24 +	0	x31 +	0	x32 +	1	x34 +	1	x41 +	1	x42 +
1	x12 +	0	x13 +	0	x14 +	0	x21 +	0	x23 +	0	x24 +	0	x31 +	0	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	1	x13 +	0	x14 +	0	x21 +	0	x23 +	0	x24 +	0	x31 +	0	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	1	x14 +	0	x21 +	0	x23 +	0	x24 +	0	x31 +	0	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	1	x21 +	0	x23 +	0	x24 +	0	x31 +	0	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	0	x21 +	1	x23 +	0	x24 +	0	x31 +	0	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	0	x21 +	0	x23 +	1	x24 +	0	x31 +	0	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	0	x21 +	0	x23 +	0	x24 +	1	x31 +	0	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	0	x21 +	0	x23 +	0	x24 +	0	x31 +	1	x32 +	0	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	0	x21 +	0	x23 +	0	x24 +	0	x31 +	0	x32 +	1	x34 +	0	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	0	x21 +	0	x23 +	0	x24 +	0	x31 +	0	x32 +	0	x34 +	1	x41 +	0	x42 +
0	x12 +	0	x13 +	0	x14 +	0	x21 +	0	x23 +	0	x24 +	0	x31 +	0	x32 +	0	x34 +	0	x41 +	1	x42 +

and x12,x13,x14,x21,x23,x24,x31,x32,x34,x41,x42,x43 >= 0 and unrestricted in sign ☐ x12, ☐ x13, ☐ x14, ☐ x21, ☐ x23, ☐ x24, ☐ x31, ☐ x32, ☐ x34, ☐ x41, ☐

Mode : Auto ▼

Find   Random   New

Solution   Help

Solution

Find dual from primal conversion
MIN z = 12x12 + 13x13 + 14x14 + 21x21 + 23x23 + 24x24 + 31x31 + 32x32 + 34x34 + 41x41 + 42x42 + 43x43
subject to
x12 + x13 + x14 + x21 + x31 + x41 = 1
x12 + x21 + x23 + x24 + x32 + x42 = 1
x13 + x23 + x31 + x32 + x34 + x43 = 1
x14 + x24 + x34 + x41 + x42 + x43 = 1
x12 <= 1
x13 <= 1
x14 <= 1
x21 <= 1
x23 <= 1
x24 <= 1
x31 <= 1
x32 <= 1
x34 <= 1
x41 <= 1
x42 <= 1
x43 <= 1
and x12,x13,x14,x21,x23,x24,x31,x32,x34,x41,x42,x43 >= 0
(Answer Only)

Dual is (Solution stpes of Dual by **BigM method**)

MAX $z_y = y_1 + y_2 + y_3 + y_4 - y_5 - y_6 - y_7 - y_8 - y_9 - y_{10} - y_{11} - y_{12} - y_{13} - y_{14} - y_{15} - y_{16}$

subject to

$$
\begin{aligned}
y_1 + y_2 \quad\quad\quad - y_5 \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad &\leq 12 \\
y_1 \quad + y_3 \quad\quad\quad - y_6 \quad\quad\quad\quad\quad\quad\quad\quad\quad &\leq 13 \\
y_1 \quad\quad + y_4 \quad\quad\quad - y_7 \quad\quad\quad\quad\quad\quad\quad &\leq 14 \\
y_1 + y_2 \quad\quad\quad\quad\quad\quad - y_8 \quad\quad\quad\quad\quad\quad &\leq 21 \\
y_2 + y_3 \quad\quad\quad\quad\quad\quad - y_9 \quad\quad\quad\quad\quad &\leq 23 \\
y_2 \quad + y_4 \quad\quad\quad\quad\quad\quad - y_{10} \quad\quad\quad\quad &\leq 24 \\
y_1 \quad + y_3 \quad\quad\quad\quad\quad\quad\quad - y_{11} \quad\quad\quad &\leq 31 \\
y_2 + y_3 \quad\quad\quad\quad\quad\quad\quad\quad - y_{12} \quad\quad &\leq 32 \\
y_3 + y_4 \quad\quad\quad\quad\quad\quad\quad\quad - y_{13} \quad &\leq 34 \\
y_1 \quad\quad + y_4 \quad\quad\quad\quad\quad\quad\quad\quad - y_{14} &\leq 41 \\
y_2 \quad + y_4 \quad\quad\quad\quad\quad\quad\quad\quad\quad - y_{15} &\leq 42 \\
y_3 + y_4 \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad - y_{16} &\leq 43
\end{aligned}
$$

and $y_5, y_6, y_7, y_8, y_9, y_{10}, y_{11}, y_{12}, y_{13}, y_{14}, y_{15}, y_{16} \geq 0$; y_1, y_2, y_3, y_4 unrestricted in sign

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