Trabalho Computacional

Não esqueçam que a saída do programa deve dizer que tipo de solução encontrou ou se não tem solução.

Aqui apresento as soluções dos exemplos.

1) Min Z = 2x1 + 3x2			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$, ,	l ,
$ \begin{array}{c} x1 \geq 0, \ x2 \geq 0 \\ z^*=2 \ x^*=(1\ 0\ 0\ 0) \\ \text{múltipla} \ e \ degenerada \end{array} \\ 2) \ \text{Min } Z = -2x1 + 2x2 \\ \text{sujeito a} \ x1 + x2 \geq 2 \\ -x1 + x2 \geq 1 \\ x2 \leq 3 \\ x1 \geq 0, \ x2 \geq 0 \\ z^*=1 \ x^*=(0\ 1\ 0) \\ \text{unica} \end{array} \\ \begin{array}{c} x1 \geq 0, \ x2 \geq 0 \\ z^*=1 \ x^*=(0\ 1\ 0) \\ \text{unica} \end{array} \\ 2) \ \text{Min } Z = -2x1 + 2x2 \\ \text{sujeito a} \ x1 + x2 \geq 2 \\ -x1 + x2 \geq 1 \\ x2 \leq 3 \\ x1 \geq 0, \ x2 \geq 0 \\ z^*=2 \ x^*=(0.5\ 1.5\ 0\ 0\ 1.5) \\ \text{múltipla} \end{array} \\ \begin{array}{c} x1 \geq 0, \ x2 \geq 0 \\ x1 \geq 0, \ x2 \geq 0 \\ z^*=2 \ x^*=(0.5\ 1.5\ 0\ 0\ 1.5) \\ \text{múltipla} \end{array} \\ \begin{array}{c} x1 \geq 0, \ x2 \geq 0 \\ x1 \geq 0, \ x2 \geq 0 \\ z^*=6 \ x^*=(0\ 3\ 1\ 2\ 0) \\ x1 \geq 0, \ x2 \geq 0, \ x3 \geq 0, \ x4 \geq 0 \\ x1 \geq 0, \ x2 \geq 0, \ x3 \geq 0 \\ x1 \geq 0, \ x2 \geq 0, \ x3 \geq 0 \\ x1 \geq 0, \ x2 \geq$	5		-
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$x1 + x2 \ge 1$	3x1 + x2 = 1	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	· ·	$x1 \ge 0, x2 \ge 0$	$x1 \ge 0, \ x2 \ge 0$
2) Min Z = $-2x1 + 2x2$ sujeito a $x1 + x2 \ge 2$ sujeito a $x1 + x2 \ge 2$ sujeito a $x1 + x2 \ge 1$ sujeito a $x1 \ge 0$, $x2 \ge 0$, $x3 \ge 0$ $x1 \ge 0$, $x2 \ge 0$ $x1 \ge 0$,	z*=2 x*=(1 0 0 0)	z*=1 x*=(0 1 0)	z*=40.5 x*=(4.5 3 0 0)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	múltipla e degenerada	única e degenerada	única
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	2) Min $Z = -2x1 + 2x2$	7) Min $Z = 2x1 + 2x2$	12) Max $Z = 60x1 + 26x2 + 15x3 + 4,75x4$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	sujeito a $x1 + x2 \ge 2$	sujeito a $x1 + x2 \ge 2$	sujeito a $20x1 + 9x2 + 6x3 + x4 \le 40$
$\begin{array}{c} x1 \geq 0, \ x2 \geq 0 \\ z^*=2 \ x^*=(0.5 \ 1.5 \ 0 \ 0 \ 1.5) \\ \text{múltipla} \end{array} \qquad \begin{array}{c} x1 \geq 0, \ x2 \geq 0 \\ z^*=6 \ x^*=(0 \ 3 \ 1 \ 2 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 4 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=(0 \ 4 \ 0 \ 0 \ 0) \\ \text{unica} \end{array} \qquad \begin{array}{c} z^*=123 \ x^*=$	$-x1+x2 \ge 1$	$-x1 + x2 \ge 1$	$10x1 + 4x2 + 2x3 + x4 \le 20$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	x2 ≤ 3	x2 ≥ 3	$x1 \ge 0, \ x2 \ge 0, x3 \ge 0, x4 \ge 0$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$x1 \ge 0, \ x2 \ge 0$	$x1 \ge 0, \ x2 \ge 0$	
3) Min Z = $2x1 - 4x2 + 3x3$ sujeito a $x1 + x2 + x3 \ge 4$ sujeito a $x1 + x2 + x3 \ge 4$ sujeito a $-x1 - x2 - x3 \ge 0$ sujeito a $-x1 - x2 - x3 \ge 0$ sujeito	$z^*=2 x^*=(0.5 1.5 0 0 1.5)$	$z^*=6 x^*=(0 3 1 2 0)$	z*=123 x*=(0 4 0 4 0 0)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	múltipla	única	única
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3) Min $Z = 2x1 - 4x2 + 3x3$	8) Min $Z = 2x1 + 4x2 + 3x3$	13) Max $Z = 60x1 + 27x2 + 18x3 + 3x4$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		sujeito a -x1 - x2 - x3 \geq 4	sujeito a $20x1 + 9x2 + 6x3 + x4 \le 40$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			$10x1 + 4x2 + 2x3 + x4 \le 20$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$6x1 - x2 + x3 \le 4$	$6x1 - x2 + x3 \le 4$	$x1 \ge 0, \ x2 \ge 0, x3 \ge 0, x4 \ge 0$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$x1 \ge 0, \ x2 \ge 0, \ x3 \ge 0$	$x1 \ge 0, \ x2 \ge 0, \ x3 \ge 0$	z*=120 x*=(2 0 0 0 0 0)
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	z → -∞		múltipla e degenerada
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	4) Min $Z = 3x1 - 4x2$	9) Min $Z = 3x1 + 4x2$	14) Max $Z = 60x1 + 27x2 + 18x3 + 3x4$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$2x1 + 3x2 \ge 18$	$2x1 + 3x2 \ge 18$	$10x1 + 4x2 + 2x3 - x4 \le 20$
5) Max Z = x1 + x2 sujeito a $2x1 + 3x2 = 5$ sujeito a $2x1 + 3x2 = 5$ sujeito a $x1 + x2 \le 4$ sujeito a $x1 + x2 \le 4$ sujeito a $x1 + x2 \ge 0$ sujeito a $x1 + x2 = x3 \le 30$ sujeito a $x1 + x2 + x3 \le 30$ sujeito a x	$x1 \ge 0, \ x2 \ge 0$	$x1 \ge 0, \ x2 \ge 0$	$x1 \ge 0, \ x2 \ge 0, x3 \ge 0, x4 \ge 0$
sujeito a $2x1 + 3x2 = 5$ sujeito a $x1 + x2 \le 4$ sujeito a $6,7x1 + 5x2 + 3,5x3 \le 150$ $-6x1 - 9x2 = -15$ $2x1 + 3x2 \ge 12$ $x1 + x2 + x3 \le 30$ $x1 + x2 \ge 0$ $x1 \ge 0, x2 \ge 0$ $5x1 - 4x2 + 3x3 \le 120$ $x1 \ge 0, x2 \ge 0$ $x1 \ge 0, x2 \ge 0$ $x1 \ge 0, x2 \ge 0, x3 \ge 0$ $z^* = 2.5 \ x^* = (2.5 \ 0 \ 0 \ 0 \ 2.5)$ $z^* = 16 \ x^* = (0 \ 4 \ 0 \ 0)$ $z^* = 9.57 \ x^* = (14.06 \ 0 \ 15.93 \ 0 \ 0 \ 1.87)$	conjunto vazio	conjunto vazio	$z \rightarrow +\infty$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	5) Max $Z = x1 + x2$	10) Min $Z = 3x1 + 4x2$	15) Max $Z = 0.42x1 + 0.30x2 + 0.23x3$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	sujeito a $2x1 + 3x2 = 5$	sujeito a $x1 + x2 \le 4$	sujeito a $6.7x1 + 5x2 + 3.5x3 \le 150$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-6x1 - 9x2 = -15	$2x1 + 3x2 \ge 12$	$x1+x2+x3 \le 30$
$z^{*}=2.5 x^{*}=(2.5 0 0 0 2.5)$ $z^{*}=16 x^{*}=(0 4 0 0)$ $z^{*}=9.57 x^{*}=(14.06 0 15.93 0 0 1.87)$	$x1 + x2 \ge 0$	$x1 \ge 0, \ x2 \ge 0$	$5x1 - 4x2 + 3x3 \le 120$
$z^{*}=2.5 x^{*}=(2.5 0 0 0 2.5)$ $z^{*}=16 x^{*}=(0 4 0 0)$ $z^{*}=9.57 x^{*}=(14.06 0 15.93 0 0 1.87)$	$x1 \ge 0, \ x2 \ge 0$		$x1 \ge 0, x2 \ge 0, x3 \ge 0$
múltipla e degenerada única e degenerada única	z*=2.5 x*=(2.5 0 0 0 2.5)	z*=16 x*=(0 4 0 0)	
	múltipla e degenerada	única e degenerada	única