$$
\begin{array}{lrrrrrrrrl}
\text{(BILP(0,0))} & \text{Maximize:} & 8y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & = z \\
& \text{Subject to:} & -4y_3 & + & 2y_4 & + & 4y_5 & + & 8y_6 & \leq 6 \\
& & 4y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & \leq 15 \\
& & 8y_3 & + & y_4 & + & 2y_5 & + & 4y_6 & \leq 12 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \leq 1 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \geq 0 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \text{are integers.}
\end{array}
$$

$y^* = (0, 0, 1, 0, 0, \frac{11}{12})$, $z = 19$

$$
\begin{array}{lrrrrrrrrl}
\text{(BILP(0,1))} & \text{Maximize:} & 4 + 8y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & = z \\
& \text{Subject to:} & 4y_3 & + & 2y_4 & + & 4y_5 & + & 8y_6 & \leq 8 \\
& & 4y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & \leq 13 \\
& & 8y_3 & + & y_4 & + & 2y_5 & + & 4y_6 & \leq 8 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \leq 1 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \geq 0 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \text{are integers.}
\end{array}
$$

$y^* = (0, 1, \frac{11}{20}, 0, 0, \frac{9}{10})$, $z = \frac{96}{5}$

$$
\begin{array}{lrrrrrrrrl}
\text{(BILP(1,0))} & \text{Maximize:} & 2 + 8y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & = z \\
& \text{Subject to:} & 4y_3 & + & 2y_4 & + & 4y_5 & + & 8y_6 & \leq 7 \\
& & 4y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & \leq 14 \\
& & 8y_3 & + & y_4 & + & 2y_5 & + & 4y_6 & \leq 10 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \leq 1 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \geq 0 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \text{are integers.}
\end{array}
$$

$y^* = (1, 0, \frac{4}{5}, 0, 0, \frac{9}{10})$, $z = \frac{96}{5}$

$$
\begin{array}{lrrrrrrrrl}
\text{(BILP(1,1))} & \text{Maximize:} & 6 + 8y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & = z \\
& \text{Subject to:} & 4y_3 & + & 2y_4 & + & 4y_5 & + & 8y_6 & \leq 9 \\
& & 4y_3 & + & 3y_4 & + & 6y_5 & + & 12y_6 & \leq 12 \\
& & 8y_3 & + & y_4 & + & 2y_5 & + & 4y_6 & \leq 6 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \leq 1 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \geq 0 \\
& & y_3, & & y_4, & & y_5, & & y_6 & \text{are integers.}
\end{array}
$$

$y^* = (1, 1, \frac{3}{10}, 0, 0, \frac{9}{10})$, $z = \frac{96}{5}$

$$
\begin{array}{lrrrrrrrl}
\text{(BILP(0,0,0))} & \text{Maximize:} & 3y_4 & + & 6y_5 & + & 12y_6 & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & \leq 6 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & \leq 15 \\
& & y_4 & + & 2y_5 & + & 4y_6 & \leq 12 \\
& & y_4, & & y_5, & & y_6 & \leq 1 \\
& & y_4, & & y_5, & & y_6 & \geq 0 \\
& & y_4, & & y_5, & & y_6 & \text{are integers.}
\end{array}
$$

$y^* = (0, 0, 0, 0, 0, \frac{3}{4})$, $z = 9$

$$
\begin{array}{lrrrrrrrl}
\text{(BILP(0,0,1))} & \text{Maximize:} & 8 + 3y_4 & + & 6y_5 & + & 12y_6 & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & \leq 10 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & \leq 11 \\
& & y_4 & + & 2y_5 & + & 4y_6 & \leq 4 \\
& & y_4, & & y_5, & & y_6 & \leq 1 \\
& & y_4, & & y_5, & & y_6 & \geq 0 \\
& & y_4, & & y_5, & & y_6 & \text{are integers.}
\end{array}
$$

$y^* = (0, 0, 1, 0, 0, \frac{11}{12})$, $z = 19$

$$
\begin{array}{rrrrrrrrl}
\text{(BILP(0,1,0))} & \text{Maximize:} & 4+3y_4 & + & 6y_5 & + & 12y_6 & & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & & \leq 8 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & & \leq 13 \\
& & y_4 & + & 2y_5 & + & 4y_6 & & \leq 8 \\
& & y_4, & & y_5, & & y_6 & & \leq 1 \\
& & y_4, & & y_5, & & y_6 & & \geq 0 \\
& & y_4, & & y_5, & & y_6 & & \text{are integers.}
\end{array}
$$

$y^* = (0, 1, 0, 0, 0, 1)$, $z = 16 \longleftarrow$ **Integer Solution**

$$
\begin{array}{rrrrrrrrl}
\text{(BILP(0,1,1))} & \text{Maximize:} & 12+3y_4 & + & 6y_5 & + & 12y_6 & & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & & \leq 4 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & & \leq 9 \\
& & y_4 & + & 2y_5 & + & 4y_6 & & \leq 0 \\
& & y_4, & & y_5, & & y_6 & & \leq 1 \\
& & y_4, & & y_5, & & y_6 & & \geq 0 \\
& & y_4, & & y_5, & & y_6 & & \text{are integers.}
\end{array}
$$

$y^* = (0, 1, 1, 0, 0, 0)$, $z = 12 \longleftarrow$ **Integer Solution**

$$
\begin{array}{rrrrrrrrl}
\text{(BILP(1,0,0))} & \text{Maximize:} & 2+3y_4 & + & 6y_5 & + & 12y_6 & & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & & \leq 7 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & & \leq 14 \\
& & y_4 & + & 2y_5 & + & 4y_6 & & \leq 10 \\
& & y_4, & & y_5, & & y_6 & & \leq 1 \\
& & y_4, & & y_5, & & y_6 & & \geq 0 \\
& & y_4, & & y_5, & & y_6 & & \text{are integers.}
\end{array}
$$

$y^* = (1, 0, 0, 0, 0, \frac{7}{8})$, $z = \frac{25}{2}$

$$
\begin{array}{rrrrrrrrl}
\text{(BILP(1,0,1))} & \text{Maximize:} & 10+3y_4 & + & 6y_5 & + & 12y_6 & & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & & \leq 3 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & & \leq 10 \\
& & y_4 & + & 2y_5 & + & 4y_6 & & \leq 2 \\
& & y_4, & & y_5, & & y_6 & & \leq 1 \\
& & y_4, & & y_5, & & y_6 & & \geq 0 \\
& & y_4, & & y_5, & & y_6 & & \text{are integers.}
\end{array}
$$

$y^* = (1, 0, 1, 0, 0, \frac{3}{8})$, $z = \frac{29}{2}$

$$
\begin{array}{rrrrrrrrl}
\text{(BILP(1,1,0))} & \text{Maximize:} & 6+3y_4 & + & 6y_5 & + & 12y_6 & & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & & \leq 9 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & & \leq 12 \\
& & y_4 & + & 2y_5 & + & 4y_6 & & \leq 6 \\
& & y_4, & & y_5, & & y_6 & & \leq 1 \\
& & y_4, & & y_5, & & y_6 & & \geq 0 \\
& & y_4, & & y_5, & & y_6 & & \text{are integers.}
\end{array}
$$

$y^* = (1, 1, 0, 0, 0, 1)$, $z = 18 \longleftarrow$ **Integer Solution**

$$
\begin{array}{rrrrrrrrl}
\text{(BILP(1,1,1))} & \text{Maximize:} & 14+3y_4 & + & 6y_5 & + & 12y_6 & & = z \\
& \text{Subject to:} & 2y_4 & + & 4y_5 & + & 8y_6 & & \leq 5 \\
& & 3y_4 & + & 6y_5 & + & 12y_6 & & \leq 8 \\
& & y_4 & + & 2y_5 & + & 4y_6 & & \leq -2 \\
& & y_4, & & y_5, & & y_6 & & \leq 1 \\
& & y_4, & & y_5, & & y_6 & & \geq 0 \\
& & y_4, & & y_5, & & y_6 & & \text{are integers.}
\end{array}
$$

Infeasible