$i \in n..1,\ j \in i..1,\ k \in i-1..1$

Ручной пересчёт СЛУ „Метод Треугольной факторизации" Шардт М.А. ИВТ 1.1.

		A			B
-7	-3	8	2	-7	90
2	9	1	1	6	-74
4	-3	5	1	8	-56
-3	-5	-5	2	-6	57
-3	-9	4	7	-2	44

$l_{ii} = a_{ii} - \sum_{j=1}^{i-1} l_{ij} \cdot r_{ji}$

$l_{ti} = a_{ti} - \sum_{j=1}^{i-1} l_{tj} \cdot r_{ji}$

$r_{it} = \frac{a_{it} - \sum l_{ij} \cdot r_{jt}}{l_{ii}}$

i от 2 до n

t от i+1 до n

$i = 2$

$l_{22} = 9 - 2 \cdot \frac{3}{7} = \frac{57}{7}$

$l_{32} = -3 - (4 \cdot \frac{3}{7}) = -\frac{33}{7}$

$l_{42} = -5 - (-3 \cdot \frac{3}{7}) = -\frac{26}{7}$

$l_{52} = -9 - (-3 \cdot \frac{3}{7}) = \frac{-54}{7}$

$r_{22} = 1$

$r_{23} = \frac{1 - (2 \cdot (-\frac{8}{7}))}{57/7} = \frac{23}{57}$

$r_{24} = \frac{1 - (2 \cdot (-\frac{2}{7}))}{57/7} = \frac{11}{57}$

$r_{25} = \frac{6 - (2 \cdot 1)}{57/7} = \frac{28}{57}$

$l_{33} = 5\left(4 - \frac{8}{7}\right) + -\frac{33}{7}\cdot\frac{23}{57} = \frac{218}{19}$

$l_{42} = -5 - \left(-3 + -\frac{8}{7} + -\frac{26}{7}\cdot\frac{23}{57}\right) \cdot \frac{395}{57}$

$l_{53} = 4 + \left(-3 \cdot -\frac{8}{7} + \left(-\frac{54}{7}\right)\frac{23}{57}\right) - \frac{70}{19}$

$r_{34} = \frac{1 - \left(4 \cdot -\frac{3}{7}\right) + \frac{33}{7}\cdot\frac{11}{57}}{1217/329}$

$r_{35} = 8\left(4 - 1 + \frac{336}{105}\right) = \frac{60}{109}$

$c = 4$

$l_{44} = 2\left(-3\cdot\frac{3}{7} + -\frac{26}{7}\right)\frac{11}{57} + -\frac{395}{57}\cdot\frac{29}{109}\Big) = \frac{1211}{329}$

$l_{34} = 7\left(-3\cdot\frac{5}{7} + -\frac{54}{7}\cdot\frac{11}{57} + \frac{70}{19}\cdot\frac{29}{109}\right) = \frac{725}{109}$

$r_{44} = 1$

$r_{45} = \frac{-6\left(-3\cdot 1 + \frac{-56}{7}\cdot\frac{28}{57} + \left(-\frac{395}{57}\right)\cdot\frac{60}{105}\right)}{1217/329} = \frac{863}{1211}$

$c = 5$

$l_{55} = -2 - \left(3 + \left(-\frac{54}{7}\right)\frac{28}{57}\cdot\frac{28}{57} + \frac{70}{19}\cdot\frac{60}{105} + \frac{725}{109}\cdot\frac{863}{1211}\right) = -\frac{2396}{1214}$

$$L = \begin{matrix} -7 & & & \\ 2 & 57/7 & & \\ 4 & -33/7 & \frac{218}{19} & \\ -3 & -26/7 & -395/57 & 1211/329 \\ -3 & -54/7 & 70/13 & \frac{725}{109} \quad -\frac{2396}{1211} \end{matrix}$$

$$R = \begin{matrix} 1 & 3/7 & -8/7 & -2/7 & 1 \\ & 1 & \frac{23}{57} & \frac{4}{57} & 28/57 \\ & & 1 & 29/109 & \frac{60}{109} \\ & & & 1 & \frac{863}{1211} \\ & & & & 1 \end{matrix}$$

$LZ = B$

$-7z_1 = 90$

$2z_1 + \frac{57}{7}z_2 = -74$

$4z_1 + \left(-\frac{33}{7}\right)z_2 + \frac{218}{19}z_3 = -56$

$3z_1 - \frac{26}{7}z_2 - \frac{395}{57}z_3 + \frac{1211}{329}z_4 = 57$

$-3z_1 = \frac{54}{7}z_2 + z_3\frac{70}{19} + \frac{725}{109}z_4 - \frac{2396}{1211}z_5 = 41$

$z_1 = 90/7$

$z_2 = -\frac{335}{55}$

$z_3 = -\frac{309}{109}$

$z_4 = \frac{2600}{1211}$

$z_5 = -6$

$RX = Z$

$$x_1 + \frac{3}{7}x_2 + \frac{4}{7}x_3 - \frac{3}{9}x_4 + x_5 = -\frac{90}{7}$$

$$x_2 + \frac{23}{55}x_3 + \frac{11}{55}x_4 + \frac{25}{11}x_5 = \frac{-336}{55}$$

$$x_3 + \frac{29}{109}x_4 + \frac{60}{109}x_5 = -\frac{309}{109}$$

$$x_4 + \frac{363}{1211}x_5 = \frac{-7600}{1211}$$

$$x_5 = -6$$

$x_1 = -5$

$x_2 = -3$

$x_3 = 1$

$x_4 = -2$

Ответ: $x_1 = -5$, $x_2 = -3$, $x_3 = 1$, $x_4 = -2$, $x_5 = -6$.