



Problem 4. «Secret coding»

There are 12 known vectors $a_i \in \mathbb{Z}^6$ and numbers b_i . All of them are given in the table below.

i	a_{i1}	a_{i2}	a_{i3}	a_{i4}	a_{i5}	a_{i6}	b_i
1	−5	−8	0	−1	−1	−4	−18
2	−5	−6	5	−7	−8	−6	−1
3	−2	−1	8	−8	−2	5	83
4	−1	6	0	−8	−3	5	37
5	2	0	−4	−2	2	−5	−8
6	−6	4	−5	3	3	0	−85
7	34	−8	−9	12	12	−8	156
8	30	−8	−1	16	39	2	231
9	9	5	29	−11	−9	−7	142
10	−37	−3	−58	12	−4	32	−340
11	4	−30	−12	6	35	−10	96
12	−30	22	−56	0	−42	25	−426

There exists an unknown vector

$$s = (s_1, \dots, s_6), \quad |s_j| \leq 10,$$

and unknown numbers $e_i \in \{-1, 0, 1\}$, such that for each $i = 1, \dots, 12$ it holds

$$b_i = a_i s + e_i.$$

Please find the vector s and all values of errors e_i .