Rank-76355 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

$$X_0^2X_3 + X_1^2X_3 + X_1X_2^2 + X_0X_3^2 + X_0X_1X_2 = 0$$

(0, 0, 0, 0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(64) is 1090785349

General information

Number of lines	7
Number of points	4289
Number of singular points	0
Number of Eckardt points	1
Number of double points	6
Number of single points	440
Number of points off lines	3842
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^7
Type of lines on points	$3, 2^6, 1^{440}, 0^{3842}$

Singular Points

The surface has 0 singular points:

The 7 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \mathbf{Pl}(1,0,0,0,0,0)_0$$

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4096} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4096} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_2 = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{4161} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{4161} = \mathbf{Pl}(1,0,0,0,0,1)_{270402}$$

$$\ell_3 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \mathbf{Pl}(0,1,0,0,0,0)_{1}$$

$$\ell_4 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{270400} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{270400} = \mathbf{Pl}(0,1,1,0,0,0)_{66}$$

$$\ell_5 = \begin{bmatrix} 1 & 0 & \epsilon^{21} & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{237242} = \begin{bmatrix} 1 & 0 & 57 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{237242} = \mathbf{Pl}(1,1,1,0,56,1)_{14951040}$$

$$\ell_6 = \begin{bmatrix} 1 & 0 & \epsilon^{42} & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{233081} = \begin{bmatrix} 1 & 0 & 56 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{233081} = \mathbf{Pl}(1,1,1,0,57,1)_{15213120}$$

Rank of lines: (0, 4096, 4161, 17047616, 270400, 237242, 233081)
Rank of points on Klein quadric: (0, 2, 270402, 1, 66, 14951040, 15213120)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$.

Double Points

The surface has 6 Double points:
The double points on the surface are:

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_2$
$P_{68} = (1,0,1,0) = \ell_1 \cap \ell_2$
$P_{123} = (56,0,1,0) = \ell_1 \cap \ell_5$
$P_{124} = (57,0,1,0) = \ell_1 \cap \ell_6$
$P_{8322} = (0,1,1,1) = \ell_5 \cap \ell_6$

Single Points

The surface has 440 single points:
The single points on the surface are:

$0 : P_3 = (0,0,0,1)$ lies on line ℓ_3
$1 : P_5 = (1,1,0,0)$ lies on line ℓ_0
$2 : P_6 = (2,1,0,0)$ lies on line ℓ_0
$3 : P_7 = (3,1,0,0)$ lies on line ℓ_0
$4 : P_8 = (4,1,0,0)$ lies on line ℓ_0
$5 : P_9 = (5,1,0,0)$ lies on line ℓ_0
$6 : P_{10} = (6,1,0,0)$ lies on line ℓ_0
$7 : P_{11} = (7,1,0,0)$ lies on line ℓ_0
$8 : P_{12} = (8,1,0,0)$ lies on line ℓ_0
$9 : P_{13} = (9,1,0,0)$ lies on line ℓ_0
$10 : P_{14} = (10,1,0,0)$ lies on line ℓ_0
$11 : P_{15} = (11,1,0,0)$ lies on line ℓ_0
$12 : P_{16} = (12,1,0,0)$ lies on line ℓ_0
$13 : P_{17} = (13,1,0,0)$ lies on line ℓ_0
$14 : P_{18} = (14,1,0,0)$ lies on line ℓ_0
$15 : P_{19} = (15,1,0,0)$ lies on line ℓ_0
$16 : P_{20} = (16,1,0,0)$ lies on line ℓ_0
$17 : P_{21} = (17,1,0,0)$ lies on line ℓ_0
$18 : P_{22} = (18,1,0,0)$ lies on line ℓ_0
$19 : P_{23} = (19,1,0,0)$ lies on line ℓ_0
$20 : P_{24} = (20,1,0,0)$ lies on line ℓ_0
$21 : P_{25} = (21,1,0,0)$ lies on line ℓ_0
$22 : P_{26} = (22,1,0,0)$ lies on line ℓ_0
$23 : P_{27} = (23,1,0,0)$ lies on line ℓ_0
$24 : P_{28} = (24,1,0,0)$ lies on line ℓ_0
$25 : P_{29} = (25,1,0,0)$ lies on line ℓ_0
$26 : P_{30} = (26,1,0,0)$ lies on line ℓ_0
$27 : P_{31} = (27,1,0,0)$ lies on line ℓ_0
$28 : P_{32} = (28,1,0,0)$ lies on line ℓ_0
$29 : P_{33} = (29,1,0,0)$ lies on line ℓ_0

30 : $P_{34} = (30, 1, 0, 0)$ lies on line ℓ_0
31 : $P_{35} = (31, 1, 0, 0)$ lies on line ℓ_0
32 : $P_{36} = (32, 1, 0, 0)$ lies on line ℓ_0
33 : $P_{37} = (33, 1, 0, 0)$ lies on line ℓ_0
34 : $P_{38} = (34, 1, 0, 0)$ lies on line ℓ_0
35 : $P_{39} = (35, 1, 0, 0)$ lies on line ℓ_0
36 : $P_{40} = (36, 1, 0, 0)$ lies on line ℓ_0
37 : $P_{41} = (37, 1, 0, 0)$ lies on line ℓ_0
38 : $P_{42} = (38, 1, 0, 0)$ lies on line ℓ_0
39 : $P_{43} = (39, 1, 0, 0)$ lies on line ℓ_0
40 : $P_{44} = (40, 1, 0, 0)$ lies on line ℓ_0
41 : $P_{45} = (41, 1, 0, 0)$ lies on line ℓ_0
42 : $P_{46} = (42, 1, 0, 0)$ lies on line ℓ_0
43 : $P_{47} = (43, 1, 0, 0)$ lies on line ℓ_0
44 : $P_{48} = (44, 1, 0, 0)$ lies on line ℓ_0
45 : $P_{49} = (45, 1, 0, 0)$ lies on line ℓ_0
46 : $P_{50} = (46, 1, 0, 0)$ lies on line ℓ_0
47 : $P_{51} = (47, 1, 0, 0)$ lies on line ℓ_0
48 : $P_{52} = (48, 1, 0, 0)$ lies on line ℓ_0
49 : $P_{53} = (49, 1, 0, 0)$ lies on line ℓ_0
50 : $P_{54} = (50, 1, 0, 0)$ lies on line ℓ_0
51 : $P_{55} = (51, 1, 0, 0)$ lies on line ℓ_0
52 : $P_{56} = (52, 1, 0, 0)$ lies on line ℓ_0
53 : $P_{57} = (53, 1, 0, 0)$ lies on line ℓ_0
54 : $P_{58} = (54, 1, 0, 0)$ lies on line ℓ_0
55 : $P_{59} = (55, 1, 0, 0)$ lies on line ℓ_0
56 : $P_{60} = (56, 1, 0, 0)$ lies on line ℓ_0
57 : $P_{61} = (57, 1, 0, 0)$ lies on line ℓ_0
58 : $P_{62} = (58, 1, 0, 0)$ lies on line ℓ_0
59 : $P_{63} = (59, 1, 0, 0)$ lies on line ℓ_0
60 : $P_{64} = (60, 1, 0, 0)$ lies on line ℓ_0
61 : $P_{65} = (61, 1, 0, 0)$ lies on line ℓ_0
62 : $P_{66} = (62, 1, 0, 0)$ lies on line ℓ_0
63 : $P_{67} = (63, 1, 0, 0)$ lies on line ℓ_0
64 : $P_{69} = (2, 0, 1, 0)$ lies on line ℓ_1
65 : $P_{70} = (3, 0, 1, 0)$ lies on line ℓ_1
66 : $P_{71} = (4, 0, 1, 0)$ lies on line ℓ_1
67 : $P_{72} = (5, 0, 1, 0)$ lies on line ℓ_1
68 : $P_{73} = (6, 0, 1, 0)$ lies on line ℓ_1
69 : $P_{74} = (7, 0, 1, 0)$ lies on line ℓ_1
70 : $P_{75} = (8, 0, 1, 0)$ lies on line ℓ_1
71 : $P_{76} = (9, 0, 1, 0)$ lies on line ℓ_1
72 : $P_{77} = (10, 0, 1, 0)$ lies on line ℓ_1
73 : $P_{78} = (11, 0, 1, 0)$ lies on line ℓ_1
74 : $P_{79} = (12, 0, 1, 0)$ lies on line ℓ_1
75 : $P_{80} = (13, 0, 1, 0)$ lies on line ℓ_1
76 : $P_{81} = (14, 0, 1, 0)$ lies on line ℓ_1
77 : $P_{82} = (15, 0, 1, 0)$ lies on line ℓ_1
78 : $P_{83} = (16, 0, 1, 0)$ lies on line ℓ_1
79 : $P_{84} = (17, 0, 1, 0)$ lies on line ℓ_1
80 : $P_{85} = (18, 0, 1, 0)$ lies on line ℓ_1
81 : $P_{86} = (19, 0, 1, 0)$ lies on line ℓ_1
82 : $P_{87} = (20, 0, 1, 0)$ lies on line ℓ_1
83 : $P_{88} = (21, 0, 1, 0)$ lies on line ℓ_1
84 : $P_{89} = (22, 0, 1, 0)$ lies on line ℓ_1
85 : $P_{90} = (23, 0, 1, 0)$ lies on line ℓ_1
86 : $P_{91} = (24, 0, 1, 0)$ lies on line ℓ_1
87 : $P_{92} = (25, 0, 1, 0)$ lies on line ℓ_1
88 : $P_{93} = (26, 0, 1, 0)$ lies on line ℓ_1
89 : $P_{94} = (27, 0, 1, 0)$ lies on line ℓ_1
90 : $P_{95} = (28, 0, 1, 0)$ lies on line ℓ_1
91 : $P_{96} = (29, 0, 1, 0)$ lies on line ℓ_1
92 : $P_{97} = (30, 0, 1, 0)$ lies on line ℓ_1
93 : $P_{98} = (31, 0, 1, 0)$ lies on line ℓ_1
94 : $P_{99} = (32, 0, 1, 0)$ lies on line ℓ_1
95 : $P_{100} = (33, 0, 1, 0)$ lies on line ℓ_1
96 : $P_{101} = (34, 0, 1, 0)$ lies on line ℓ_1
97 : $P_{102} = (35, 0, 1, 0)$ lies on line ℓ_1
98 : $P_{103} = (36, 0, 1, 0)$ lies on line ℓ_1
99 : $P_{104} = (37, 0, 1, 0)$ lies on line ℓ_1
100 : $P_{105} = (38, 0, 1, 0)$ lies on line ℓ_1
101 : $P_{106} = (39, 0, 1, 0)$ lies on line ℓ_1
102 : $P_{107} = (40, 0, 1, 0)$ lies on line ℓ_1
103 : $P_{108} = (41, 0, 1, 0)$ lies on line ℓ_1
104 : $P_{109} = (42, 0, 1, 0)$ lies on line ℓ_1
105 : $P_{110} = (43, 0, 1, 0)$ lies on line ℓ_1
106 : $P_{111} = (44, 0, 1, 0)$ lies on line ℓ_1
107 : $P_{112} = (45, 0, 1, 0)$ lies on line ℓ_1
108 : $P_{113} = (46, 0, 1, 0)$ lies on line ℓ_1
109 : $P_{114} = (47, 0, 1, 0)$ lies on line ℓ_1
110 : $P_{115} = (48, 0, 1, 0)$ lies on line ℓ_1
111 : $P_{116} = (49, 0, 1, 0)$ lies on line ℓ_1
112 : $P_{117} = (50, 0, 1, 0)$ lies on line ℓ_1
113 : $P_{118} = (51, 0, 1, 0)$ lies on line ℓ_1
114 : $P_{119} = (52, 0, 1, 0)$ lies on line ℓ_1
115 : $P_{120} = (53, 0, 1, 0)$ lies on line ℓ_1
116 : $P_{121} = (54, 0, 1, 0)$ lies on line ℓ_1
117 : $P_{122} = (55, 0, 1, 0)$ lies on line ℓ_1
118 : $P_{125} = (58, 0, 1, 0)$ lies on line ℓ_1
119 : $P_{126} = (59, 0, 1, 0)$ lies on line ℓ_1
120 : $P_{127} = (60, 0, 1, 0)$ lies on line ℓ_1
121 : $P_{128} = (61, 0, 1, 0)$ lies on line ℓ_1
122 : $P_{129} = (62, 0, 1, 0)$ lies on line ℓ_1
123 : $P_{130} = (63, 0, 1, 0)$ lies on line ℓ_1
124 : $P_{132} = (1, 1, 1, 0)$ lies on line ℓ_2
125 : $P_{196} = (1, 2, 1, 0)$ lies on line ℓ_2
126 : $P_{260} = (1, 3, 1, 0)$ lies on line ℓ_2
127 : $P_{324} = (1, 4, 1, 0)$ lies on line ℓ_2
128 : $P_{388} = (1, 5, 1, 0)$ lies on line ℓ_2
129 : $P_{452} = (1, 6, 1, 0)$ lies on line ℓ_2
130 : $P_{516} = (1, 7, 1, 0)$ lies on line ℓ_2
131 : $P_{580} = (1, 8, 1, 0)$ lies on line ℓ_2
132 : $P_{644} = (1, 9, 1, 0)$ lies on line ℓ_2
133 : $P_{708} = (1, 10, 1, 0)$ lies on line ℓ_2
134 : $P_{772} = (1, 11, 1, 0)$ lies on line ℓ_2
135 : $P_{836} = (1, 12, 1, 0)$ lies on line ℓ_2
136 : $P_{900} = (1, 13, 1, 0)$ lies on line ℓ_2
137 : $P_{964} = (1, 14, 1, 0)$ lies on line ℓ_2

138 : $P_{1028} = (1, 15, 1, 0)$ lies on line ℓ_2
139 : $P_{1092} = (1, 16, 1, 0)$ lies on line ℓ_2
140 : $P_{1156} = (1, 17, 1, 0)$ lies on line ℓ_2
141 : $P_{1220} = (1, 18, 1, 0)$ lies on line ℓ_2
142 : $P_{1284} = (1, 19, 1, 0)$ lies on line ℓ_2
143 : $P_{1348} = (1, 20, 1, 0)$ lies on line ℓ_2
144 : $P_{1412} = (1, 21, 1, 0)$ lies on line ℓ_2
145 : $P_{1476} = (1, 22, 1, 0)$ lies on line ℓ_2
146 : $P_{1540} = (1, 23, 1, 0)$ lies on line ℓ_2
147 : $P_{1604} = (1, 24, 1, 0)$ lies on line ℓ_2
148 : $P_{1668} = (1, 25, 1, 0)$ lies on line ℓ_2
149 : $P_{1732} = (1, 26, 1, 0)$ lies on line ℓ_2
150 : $P_{1796} = (1, 27, 1, 0)$ lies on line ℓ_2
151 : $P_{1860} = (1, 28, 1, 0)$ lies on line ℓ_2
152 : $P_{1924} = (1, 29, 1, 0)$ lies on line ℓ_2
153 : $P_{1988} = (1, 30, 1, 0)$ lies on line ℓ_2
154 : $P_{2052} = (1, 31, 1, 0)$ lies on line ℓ_2
155 : $P_{2116} = (1, 32, 1, 0)$ lies on line ℓ_2
156 : $P_{2180} = (1, 33, 1, 0)$ lies on line ℓ_2
157 : $P_{2244} = (1, 34, 1, 0)$ lies on line ℓ_2
158 : $P_{2308} = (1, 35, 1, 0)$ lies on line ℓ_2
159 : $P_{2372} = (1, 36, 1, 0)$ lies on line ℓ_2
160 : $P_{2436} = (1, 37, 1, 0)$ lies on line ℓ_2
161 : $P_{2500} = (1, 38, 1, 0)$ lies on line ℓ_2
162 : $P_{2564} = (1, 39, 1, 0)$ lies on line ℓ_2
163 : $P_{2628} = (1, 40, 1, 0)$ lies on line ℓ_2
164 : $P_{2692} = (1, 41, 1, 0)$ lies on line ℓ_2
165 : $P_{2756} = (1, 42, 1, 0)$ lies on line ℓ_2
166 : $P_{2820} = (1, 43, 1, 0)$ lies on line ℓ_2
167 : $P_{2884} = (1, 44, 1, 0)$ lies on line ℓ_2
168 : $P_{2948} = (1, 45, 1, 0)$ lies on line ℓ_2
169 : $P_{3012} = (1, 46, 1, 0)$ lies on line ℓ_2
170 : $P_{3076} = (1, 47, 1, 0)$ lies on line ℓ_2
171 : $P_{3140} = (1, 48, 1, 0)$ lies on line ℓ_2
172 : $P_{3204} = (1, 49, 1, 0)$ lies on line ℓ_2
173 : $P_{3268} = (1, 50, 1, 0)$ lies on line ℓ_2
174 : $P_{3332} = (1, 51, 1, 0)$ lies on line ℓ_2
175 : $P_{3396} = (1, 52, 1, 0)$ lies on line ℓ_2
176 : $P_{3460} = (1, 53, 1, 0)$ lies on line ℓ_2
177 : $P_{3524} = (1, 54, 1, 0)$ lies on line ℓ_2
178 : $P_{3588} = (1, 55, 1, 0)$ lies on line ℓ_2
179 : $P_{3652} = (1, 56, 1, 0)$ lies on line ℓ_2
180 : $P_{3716} = (1, 57, 1, 0)$ lies on line ℓ_2
181 : $P_{3780} = (1, 58, 1, 0)$ lies on line ℓ_2
182 : $P_{3844} = (1, 59, 1, 0)$ lies on line ℓ_2
183 : $P_{3908} = (1, 60, 1, 0)$ lies on line ℓ_2
184 : $P_{3972} = (1, 61, 1, 0)$ lies on line ℓ_2
185 : $P_{4036} = (1, 62, 1, 0)$ lies on line ℓ_2
186 : $P_{4100} = (1, 63, 1, 0)$ lies on line ℓ_2
187 : $P_{4163} = (1, 0, 0, 1)$ lies on line ℓ_4
188 : $P_{4282} = (56, 1, 0, 1)$ lies on line ℓ_5
189 : $P_{4283} = (57, 1, 0, 1)$ lies on line ℓ_6
190 : $P_{8258} = (0, 0, 1, 1)$ lies on line ℓ_3
191 : $P_{8259} = (1, 0, 1, 1)$ lies on line ℓ_4
192 : $P_{12353} = (0, 0, 2, 1)$ lies on line ℓ_3
193 : $P_{12354} = (1, 0, 2, 1)$ lies on line ℓ_4
194 : $P_{12458} = (41, 1, 2, 1)$ lies on line ℓ_5
195 : $P_{12459} = (42, 1, 2, 1)$ lies on line ℓ_6
196 : $P_{16449} = (0, 0, 3, 1)$ lies on line ℓ_3
197 : $P_{16450} = (1, 0, 3, 1)$ lies on line ℓ_4
198 : $P_{16530} = (17, 1, 3, 1)$ lies on line ℓ_5
199 : $P_{16532} = (19, 1, 3, 1)$ lies on line ℓ_6
200 : $P_{20545} = (0, 0, 4, 1)$ lies on line ℓ_3
201 : $P_{20546} = (1, 0, 4, 1)$ lies on line ℓ_4
202 : $P_{20635} = (26, 1, 4, 1)$ lies on line ℓ_5
203 : $P_{20640} = (31, 1, 4, 1)$ lies on line ℓ_6
204 : $P_{24641} = (0, 0, 5, 1)$ lies on line ℓ_3
205 : $P_{24642} = (1, 0, 5, 1)$ lies on line ℓ_4
206 : $P_{24739} = (34, 1, 5, 1)$ lies on line ℓ_5
207 : $P_{24743} = (38, 1, 5, 1)$ lies on line ℓ_6
208 : $P_{28737} = (0, 0, 6, 1)$ lies on line ℓ_3
209 : $P_{28738} = (1, 0, 6, 1)$ lies on line ℓ_4
210 : $P_{28812} = (11, 1, 6, 1)$ lies on line ℓ_5
211 : $P_{28813} = (12, 1, 6, 1)$ lies on line ℓ_6
212 : $P_{32833} = (0, 0, 7, 1)$ lies on line ℓ_3
213 : $P_{32834} = (1, 0, 7, 1)$ lies on line ℓ_4
214 : $P_{32948} = (51, 1, 7, 1)$ lies on line ℓ_5
215 : $P_{32950} = (53, 1, 7, 1)$ lies on line ℓ_6
216 : $P_{36929} = (0, 0, 8, 1)$ lies on line ℓ_3
217 : $P_{36930} = (1, 0, 8, 1)$ lies on line ℓ_4
218 : $P_{37013} = (20, 1, 8, 1)$ lies on line ℓ_6
219 : $P_{37022} = (29, 1, 8, 1)$ lies on line ℓ_5
220 : $P_{41025} = (0, 0, 9, 1)$ lies on line ℓ_3
221 : $P_{41026} = (1, 0, 9, 1)$ lies on line ℓ_4
222 : $P_{41126} = (37, 1, 9, 1)$ lies on line ℓ_5
223 : $P_{41134} = (45, 1, 9, 1)$ lies on line ℓ_6
224 : $P_{45121} = (0, 0, 10, 1)$ lies on line ℓ_3
225 : $P_{45122} = (1, 0, 10, 1)$ lies on line ℓ_4
226 : $P_{45192} = (7, 1, 10, 1)$ lies on line ℓ_6
227 : $P_{45197} = (12, 1, 10, 1)$ lies on line ℓ_5
228 : $P_{49217} = (0, 0, 11, 1)$ lies on line ℓ_3
229 : $P_{49218} = (1, 0, 11, 1)$ lies on line ℓ_4
230 : $P_{49333} = (52, 1, 11, 1)$ lies on line ℓ_5
231 : $P_{49343} = (62, 1, 11, 1)$ lies on line ℓ_6
232 : $P_{53313} = (0, 0, 12, 1)$ lies on line ℓ_3
233 : $P_{53314} = (1, 0, 12, 1)$ lies on line ℓ_4
234 : $P_{53427} = (50, 1, 12, 1)$ lies on line ℓ_6
235 : $P_{53440} = (63, 1, 12, 1)$ lies on line ℓ_5
236 : $P_{57409} = (0, 0, 13, 1)$ lies on line ℓ_3
237 : $P_{57410} = (1, 0, 13, 1)$ lies on line ℓ_4
238 : $P_{57480} = (7, 1, 13, 1)$ lies on line ℓ_5
239 : $P_{57484} = (11, 1, 13, 1)$ lies on line ℓ_6
240 : $P_{61505} = (0, 0, 14, 1)$ lies on line ℓ_3
241 : $P_{61506} = (1, 0, 14, 1)$ lies on line ℓ_4
242 : $P_{61602} = (33, 1, 14, 1)$ lies on line ℓ_6
243 : $P_{61615} = (46, 1, 14, 1)$ lies on line ℓ_5
244 : $P_{65601} = (0, 0, 15, 1)$ lies on line ℓ_3
245 : $P_{65602} = (1, 0, 15, 1)$ lies on line ℓ_4

246 : $P_{65687} = (22, 1, 15, 1)$ lies on line ℓ_5
247 : $P_{65689} = (24, 1, 15, 1)$ lies on line ℓ_6
248 : $P_{69697} = (0, 0, 16, 1)$ lies on line ℓ_3
249 : $P_{69698} = (1, 0, 16, 1)$ lies on line ℓ_4
250 : $P_{69763} = (2, 1, 16, 1)$ lies on line ℓ_6
251 : $P_{69780} = (19, 1, 16, 1)$ lies on line ℓ_5
252 : $P_{73793} = (0, 0, 17, 1)$ lies on line ℓ_3
253 : $P_{73794} = (1, 0, 17, 1)$ lies on line ℓ_4
254 : $P_{73900} = (43, 1, 17, 1)$ lies on line ℓ_5
255 : $P_{73916} = (59, 1, 17, 1)$ lies on line ℓ_6
256 : $P_{77889} = (0, 0, 18, 1)$ lies on line ℓ_3
257 : $P_{77890} = (1, 0, 18, 1)$ lies on line ℓ_4
258 : $P_{77955} = (2, 1, 18, 1)$ lies on line ℓ_5
259 : $P_{77970} = (17, 1, 18, 1)$ lies on line ℓ_6
260 : $P_{81985} = (0, 0, 19, 1)$ lies on line ℓ_3
261 : $P_{81986} = (1, 0, 19, 1)$ lies on line ℓ_4
262 : $P_{82089} = (40, 1, 19, 1)$ lies on line ℓ_6
263 : $P_{82107} = (58, 1, 19, 1)$ lies on line ℓ_5
264 : $P_{86081} = (0, 0, 20, 1)$ lies on line ℓ_3
265 : $P_{86082} = (1, 0, 20, 1)$ lies on line ℓ_4
266 : $P_{86181} = (36, 1, 20, 1)$ lies on line ℓ_6
267 : $P_{86194} = (49, 1, 20, 1)$ lies on line ℓ_5
268 : $P_{90177} = (0, 0, 21, 1)$ lies on line ℓ_3
269 : $P_{90178} = (1, 0, 21, 1)$ lies on line ℓ_4
270 : $P_{90250} = (9, 1, 21, 1)$ lies on line ℓ_5
271 : $P_{90270} = (29, 1, 21, 1)$ lies on line ℓ_6
272 : $P_{94273} = (0, 0, 22, 1)$ lies on line ℓ_3
273 : $P_{94274} = (1, 0, 22, 1)$ lies on line ℓ_4
274 : $P_{94369} = (32, 1, 22, 1)$ lies on line ℓ_5
275 : $P_{94392} = (55, 1, 22, 1)$ lies on line ℓ_6
276 : $P_{98369} = (0, 0, 23, 1)$ lies on line ℓ_3
277 : $P_{98370} = (1, 0, 23, 1)$ lies on line ℓ_4
278 : $P_{98447} = (14, 1, 23, 1)$ lies on line ℓ_6
279 : $P_{98457} = (24, 1, 23, 1)$ lies on line ℓ_5
280 : $P_{102465} = (0, 0, 24, 1)$ lies on line ℓ_3
281 : $P_{102466} = (1, 0, 24, 1)$ lies on line ℓ_4
282 : $P_{102576} = (47, 1, 24, 1)$ lies on line ℓ_6
283 : $P_{102583} = (54, 1, 24, 1)$ lies on line ℓ_5
284 : $P_{106561} = (0, 0, 25, 1)$ lies on line ℓ_3
285 : $P_{106562} = (1, 0, 25, 1)$ lies on line ℓ_4
286 : $P_{106639} = (14, 1, 25, 1)$ lies on line ℓ_5
287 : $P_{106647} = (22, 1, 25, 1)$ lies on line ℓ_6
288 : $P_{110657} = (0, 0, 26, 1)$ lies on line ℓ_3
289 : $P_{110658} = (1, 0, 26, 1)$ lies on line ℓ_4
290 : $P_{110760} = (39, 1, 26, 1)$ lies on line ℓ_5
291 : $P_{110781} = (60, 1, 26, 1)$ lies on line ℓ_6
292 : $P_{114753} = (0, 0, 27, 1)$ lies on line ℓ_3
293 : $P_{114754} = (1, 0, 27, 1)$ lies on line ℓ_4
294 : $P_{114822} = (5, 1, 27, 1)$ lies on line ℓ_6
295 : $P_{114848} = (31, 1, 27, 1)$ lies on line ℓ_5
296 : $P_{118849} = (0, 0, 28, 1)$ lies on line ℓ_3
297 : $P_{118850} = (1, 0, 28, 1)$ lies on line ℓ_4
298 : $P_{118922} = (9, 1, 28, 1)$ lies on line ℓ_6
299 : $P_{118933} = (20, 1, 28, 1)$ lies on line ℓ_5
300 : $P_{122945} = (0, 0, 29, 1)$ lies on line ℓ_3
301 : $P_{122946} = (1, 0, 29, 1)$ lies on line ℓ_4
302 : $P_{123053} = (44, 1, 29, 1)$ lies on line ℓ_5
303 : $P_{123057} = (48, 1, 29, 1)$ lies on line ℓ_6
304 : $P_{127041} = (0, 0, 30, 1)$ lies on line ℓ_3
305 : $P_{127042} = (1, 0, 30, 1)$ lies on line ℓ_4
306 : $P_{127110} = (5, 1, 30, 1)$ lies on line ℓ_5
307 : $P_{127131} = (26, 1, 30, 1)$ lies on line ℓ_6
308 : $P_{131137} = (0, 0, 31, 1)$ lies on line ℓ_3
309 : $P_{131138} = (1, 0, 31, 1)$ lies on line ℓ_4
310 : $P_{131236} = (35, 1, 31, 1)$ lies on line ℓ_6
311 : $P_{131262} = (61, 1, 31, 1)$ lies on line ℓ_5
312 : $P_{135233} = (0, 0, 32, 1)$ lies on line ℓ_3
313 : $P_{135234} = (1, 0, 32, 1)$ lies on line ℓ_4
314 : $P_{135312} = (15, 1, 32, 1)$ lies on line ℓ_5
315 : $P_{135343} = (46, 1, 32, 1)$ lies on line ℓ_6
316 : $P_{139329} = (0, 0, 33, 1)$ lies on line ℓ_3
317 : $P_{139330} = (1, 0, 33, 1)$ lies on line ℓ_4
318 : $P_{139416} = (23, 1, 33, 1)$ lies on line ℓ_6
319 : $P_{139448} = (55, 1, 33, 1)$ lies on line ℓ_5
320 : $P_{143425} = (0, 0, 34, 1)$ lies on line ℓ_3
321 : $P_{143426} = (1, 0, 34, 1)$ lies on line ℓ_4
322 : $P_{143519} = (30, 1, 34, 1)$ lies on line ℓ_5
323 : $P_{143550} = (61, 1, 34, 1)$ lies on line ℓ_6
324 : $P_{147521} = (0, 0, 35, 1)$ lies on line ℓ_3
325 : $P_{147522} = (1, 0, 35, 1)$ lies on line ℓ_4
326 : $P_{147589} = (4, 1, 35, 1)$ lies on line ℓ_6
327 : $P_{147623} = (38, 1, 35, 1)$ lies on line ℓ_5
328 : $P_{151617} = (0, 0, 36, 1)$ lies on line ℓ_3
329 : $P_{151618} = (1, 0, 36, 1)$ lies on line ℓ_4
330 : $P_{151689} = (8, 1, 36, 1)$ lies on line ℓ_6
331 : $P_{151726} = (45, 1, 36, 1)$ lies on line ℓ_5
332 : $P_{155713} = (0, 0, 37, 1)$ lies on line ℓ_3
333 : $P_{155714} = (1, 0, 37, 1)$ lies on line ℓ_4
334 : $P_{155798} = (21, 1, 37, 1)$ lies on line ℓ_5
335 : $P_{155826} = (49, 1, 37, 1)$ lies on line ℓ_6
336 : $P_{159809} = (0, 0, 38, 1)$ lies on line ℓ_3
337 : $P_{159810} = (1, 0, 38, 1)$ lies on line ℓ_4
338 : $P_{159900} = (27, 1, 38, 1)$ lies on line ℓ_6
339 : $P_{159933} = (60, 1, 38, 1)$ lies on line ℓ_5
340 : $P_{163905} = (0, 0, 39, 1)$ lies on line ℓ_3
341 : $P_{163906} = (1, 0, 39, 1)$ lies on line ℓ_4
342 : $P_{163973} = (4, 1, 39, 1)$ lies on line ℓ_5
343 : $P_{164003} = (34, 1, 39, 1)$ lies on line ℓ_6
344 : $P_{168001} = (0, 0, 40, 1)$ lies on line ℓ_3
345 : $P_{168002} = (1, 0, 40, 1)$ lies on line ℓ_4
346 : $P_{168068} = (3, 1, 40, 1)$ lies on line ℓ_6
347 : $P_{168107} = (42, 1, 40, 1)$ lies on line ℓ_5
348 : $P_{172097} = (0, 0, 41, 1)$ lies on line ℓ_3
349 : $P_{172098} = (1, 0, 41, 1)$ lies on line ℓ_4
350 : $P_{172179} = (18, 1, 41, 1)$ lies on line ℓ_5
351 : $P_{172219} = (58, 1, 41, 1)$ lies on line ℓ_6
352 : $P_{176193} = (0, 0, 42, 1)$ lies on line ℓ_3
353 : $P_{176194} = (1, 0, 42, 1)$ lies on line ℓ_4

354 : $P_{176273} = (16, 1, 42, 1)$ lies on line ℓ_6
355 : $P_{176316} = (59, 1, 42, 1)$ lies on line ℓ_5
356 : $P_{180289} = (0, 0, 43, 1)$ lies on line ℓ_3
357 : $P_{180290} = (1, 0, 43, 1)$ lies on line ℓ_4
358 : $P_{180356} = (3, 1, 43, 1)$ lies on line ℓ_5
359 : $P_{180394} = (41, 1, 43, 1)$ lies on line ℓ_6
360 : $P_{184385} = (0, 0, 44, 1)$ lies on line ℓ_3
361 : $P_{184386} = (1, 0, 44, 1)$ lies on line ℓ_4
362 : $P_{184457} = (8, 1, 44, 1)$ lies on line ℓ_5
363 : $P_{184486} = (37, 1, 44, 1)$ lies on line ℓ_6
364 : $P_{188481} = (0, 0, 45, 1)$ lies on line ℓ_3
365 : $P_{188482} = (1, 0, 45, 1)$ lies on line ℓ_4
366 : $P_{188573} = (28, 1, 45, 1)$ lies on line ℓ_6
367 : $P_{188593} = (48, 1, 45, 1)$ lies on line ℓ_5
368 : $P_{192577} = (0, 0, 46, 1)$ lies on line ℓ_3
369 : $P_{192578} = (1, 0, 46, 1)$ lies on line ℓ_4
370 : $P_{192666} = (25, 1, 46, 1)$ lies on line ℓ_5
371 : $P_{192695} = (54, 1, 46, 1)$ lies on line ℓ_6
372 : $P_{196673} = (0, 0, 47, 1)$ lies on line ℓ_3
373 : $P_{196674} = (1, 0, 47, 1)$ lies on line ℓ_4
374 : $P_{196752} = (15, 1, 47, 1)$ lies on line ℓ_6
375 : $P_{196770} = (33, 1, 47, 1)$ lies on line ℓ_5
376 : $P_{200769} = (0, 0, 48, 1)$ lies on line ℓ_3
377 : $P_{200770} = (1, 0, 48, 1)$ lies on line ℓ_4
378 : $P_{200854} = (21, 1, 48, 1)$ lies on line ℓ_6
379 : $P_{200869} = (36, 1, 48, 1)$ lies on line ℓ_5
380 : $P_{204865} = (0, 0, 49, 1)$ lies on line ℓ_3
381 : $P_{204866} = (1, 0, 49, 1)$ lies on line ℓ_4
382 : $P_{204957} = (28, 1, 49, 1)$ lies on line ℓ_5
383 : $P_{204973} = (44, 1, 49, 1)$ lies on line ℓ_6
384 : $P_{208961} = (0, 0, 50, 1)$ lies on line ℓ_3
385 : $P_{208962} = (1, 0, 50, 1)$ lies on line ℓ_4
386 : $P_{209031} = (6, 1, 50, 1)$ lies on line ℓ_6
387 : $P_{209078} = (53, 1, 50, 1)$ lies on line ℓ_5
388 : $P_{213057} = (0, 0, 51, 1)$ lies on line ℓ_3
389 : $P_{213058} = (1, 0, 51, 1)$ lies on line ℓ_4
390 : $P_{213134} = (13, 1, 51, 1)$ lies on line ℓ_5
391 : $P_{213184} = (63, 1, 51, 1)$ lies on line ℓ_6
392 : $P_{217153} = (0, 0, 52, 1)$ lies on line ℓ_3
393 : $P_{217154} = (1, 0, 52, 1)$ lies on line ℓ_4
394 : $P_{217223} = (6, 1, 52, 1)$ lies on line ℓ_5
395 : $P_{217268} = (51, 1, 52, 1)$ lies on line ℓ_6
396 : $P_{221249} = (0, 0, 53, 1)$ lies on line ℓ_3
397 : $P_{221250} = (1, 0, 53, 1)$ lies on line ℓ_4
398 : $P_{221323} = (10, 1, 53, 1)$ lies on line ℓ_6
399 : $P_{221375} = (62, 1, 53, 1)$ lies on line ℓ_5
400 : $P_{225345} = (0, 0, 54, 1)$ lies on line ℓ_3
401 : $P_{225346} = (1, 0, 54, 1)$ lies on line ℓ_4
402 : $P_{225432} = (23, 1, 54, 1)$ lies on line ℓ_5
403 : $P_{225441} = (32, 1, 54, 1)$ lies on line ℓ_6
404 : $P_{229441} = (0, 0, 55, 1)$ lies on line ℓ_3
405 : $P_{229442} = (1, 0, 55, 1)$ lies on line ℓ_4
406 : $P_{229530} = (25, 1, 55, 1)$ lies on line ℓ_6
407 : $P_{229552} = (47, 1, 55, 1)$ lies on line ℓ_5
408 : $P_{233537} = (0, 0, 56, 1)$ lies on line ℓ_3
409 : $P_{233538} = (1, 0, 56, 1)$ lies on line ℓ_4
410 : $P_{233602} = (1, 1, 56, 1)$ lies on line ℓ_5
411 : $P_{233657} = (56, 1, 56, 1)$ lies on line ℓ_6
412 : $P_{237633} = (0, 0, 57, 1)$ lies on line ℓ_3
413 : $P_{237634} = (1, 0, 57, 1)$ lies on line ℓ_4
414 : $P_{237698} = (1, 1, 57, 1)$ lies on line ℓ_6
415 : $P_{237754} = (57, 1, 57, 1)$ lies on line ℓ_5
416 : $P_{241729} = (0, 0, 58, 1)$ lies on line ℓ_3
417 : $P_{241730} = (1, 0, 58, 1)$ lies on line ℓ_4
418 : $P_{241809} = (16, 1, 58, 1)$ lies on line ℓ_5
419 : $P_{241836} = (43, 1, 58, 1)$ lies on line ℓ_6
420 : $P_{245825} = (0, 0, 59, 1)$ lies on line ℓ_3
421 : $P_{245826} = (1, 0, 59, 1)$ lies on line ℓ_4
422 : $P_{245907} = (18, 1, 59, 1)$ lies on line ℓ_6
423 : $P_{245929} = (40, 1, 59, 1)$ lies on line ℓ_5
424 : $P_{249921} = (0, 0, 60, 1)$ lies on line ℓ_3
425 : $P_{249922} = (1, 0, 60, 1)$ lies on line ℓ_4
426 : $P_{250015} = (30, 1, 60, 1)$ lies on line ℓ_6
427 : $P_{250020} = (35, 1, 60, 1)$ lies on line ℓ_5
428 : $P_{254017} = (0, 0, 61, 1)$ lies on line ℓ_3
429 : $P_{254018} = (1, 0, 61, 1)$ lies on line ℓ_4
430 : $P_{254108} = (27, 1, 61, 1)$ lies on line ℓ_5
431 : $P_{254120} = (39, 1, 61, 1)$ lies on line ℓ_6
432 : $P_{258113} = (0, 0, 62, 1)$ lies on line ℓ_3
433 : $P_{258114} = (1, 0, 62, 1)$ lies on line ℓ_4
434 : $P_{258190} = (13, 1, 62, 1)$ lies on line ℓ_6
435 : $P_{258227} = (50, 1, 62, 1)$ lies on line ℓ_5
436 : $P_{262209} = (0, 0, 63, 1)$ lies on line ℓ_3
437 : $P_{262210} = (1, 0, 63, 1)$ lies on line ℓ_4
438 : $P_{262283} = (10, 1, 63, 1)$ lies on line ℓ_5
439 : $P_{262325} = (52, 1, 63, 1)$ lies on line ℓ_6

The single points on the surface are:

Points on surface but on no line

The surface has 3842 points not on any line:
Too many to print.

Line Intersection Graph

	0 1 2 3 4 5 6
0	0 1 1 0 0 0 0
1	1 0 1 1 1 1 1
2	1 1 0 0 0 0 0
3	0 1 0 0 1 0 0
4	0 1 0 1 0 0 0
5	0 1 0 0 0 0 1
6	0 1 0 0 0 1 0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2
in point	P_0	P_1

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6
in point	P_0	P_{68}	P_2	P_2	P_{123}	P_{124}

Line 2 intersects

Line	ℓ_0	ℓ_1
in point	P_1	P_{68}

Line 3 intersects

Line	ℓ_1	ℓ_4
in point	P_2	P_2

Line 4 intersects

Line	ℓ_1	ℓ_3
in point	P_2	P_2

Line 5 intersects

Line	ℓ_1	ℓ_6
in point	P_{123}	P_{8322}

Line 6 intersects

Line	ℓ_1	ℓ_5
in point	P_{124}	P_{8322}

The surface has 4289 points:
Too many to print.