Rank-65867 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

$$X_3^3 + X_0^2X_3 + X_1^2X_2 + X_0X_1X_2 = 0$$

(0, 0, 0, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(64) is 1091047493

General information

Number of lines	8
Number of points	4289
Number of singular points	3
Number of Eckardt points	2
Number of double points	6
Number of single points	498
Number of points off lines	3782
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^8
Type of lines on points	4, 3^2, 2^6, 1^{498}, 0^{3782}

Singular Points

The surface has 3 singular points:

$0: P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$
$1: P_{4163} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1)$
$2: P_{4227} = \mathbf{P}(1,1,0,1) = \mathbf{P}(1,1,0,1)$

The 8 Lines

The lines and their Pluecker coordinates are:

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

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

$$\ell_2 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{8257} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{8257} = \mathbf{Pl}(0,0,1,0,0,1)_{270528}$$

$$\ell_3 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{266304} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{266304} = \mathbf{Pl}(1,0,0,1,0,0)_{130}$$

$$\ell_4 = \begin{bmatrix} 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{274561} = \begin{bmatrix} 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{274561} = \mathbf{Pl}(0,1,1,0,0,1)_{270592}$$

$$\ell_5 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{270400} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{270400} = \mathbf{Pl}(0,1,1,0,0,0)_{66}$$

$$\ell_6 = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{4226} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{4226} = \mathbf{Pl}(1,1,1,0,1,1)_{536640}$$

$$\ell_7 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{266369} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{266369} = \mathbf{Pl}(1,1,1,1,1,0)_{20354}$$

Rank of lines: (0, 4096, 8257, 266304, 274561, 270400, 4226, 266369)
Rank of points on Klein quadric: (0, 2, 270528, 130, 270592, 66, 536640, 20354)

Eckardt Points

The surface has 2 Eckardt points:
$0 : P_{4163} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1)$,
$1 : P_{4227} = \mathbf{P}(1,1,0,1) = \mathbf{P}(1,1,0,1)$.

Double Points

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

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$
$P_5 = (1,1,0,0) = \ell_0 \cap \ell_2$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_3$
$P_{68} = (1,0,1,0) = \ell_1 \cap \ell_6$
$P_{132} = (1,1,1,0) = \ell_2 \cap \ell_7$
$P_{8322} = (0,1,1,1) = \ell_6 \cap \ell_7$

Single Points

The surface has 498 single points:
The single points on the surface are:

$0 : P_4 = (1,1,1,1)$ lies on line ℓ_4
$1 : P_6 = (2,1,0,0)$ lies on line ℓ_0
$2 : P_7 = (3,1,0,0)$ lies on line ℓ_0
$3 : P_8 = (4,1,0,0)$ lies on line ℓ_0
$4 : P_9 = (5,1,0,0)$ lies on line ℓ_0
$5 : P_{10} = (6,1,0,0)$ lies on line ℓ_0
$6 : P_{11} = (7,1,0,0)$ lies on line ℓ_0
$7 : P_{12} = (8,1,0,0)$ lies on line ℓ_0
$8 : P_{13} = (9,1,0,0)$ lies on line ℓ_0
$9 : P_{14} = (10,1,0,0)$ lies on line ℓ_0
$10 : P_{15} = (11,1,0,0)$ lies on line ℓ_0
$11 : P_{16} = (12,1,0,0)$ lies on line ℓ_0
$12 : P_{17} = (13,1,0,0)$ lies on line ℓ_0
$13 : P_{18} = (14,1,0,0)$ lies on line ℓ_0
$14 : P_{19} = (15,1,0,0)$ lies on line ℓ_0
$15 : P_{20} = (16,1,0,0)$ lies on line ℓ_0
$16 : P_{21} = (17,1,0,0)$ lies on line ℓ_0
$17 : P_{22} = (18,1,0,0)$ lies on line ℓ_0

18 : $P_{23} = (19, 1, 0, 0)$ lies on line ℓ_0
19 : $P_{24} = (20, 1, 0, 0)$ lies on line ℓ_0
20 : $P_{25} = (21, 1, 0, 0)$ lies on line ℓ_0
21 : $P_{26} = (22, 1, 0, 0)$ lies on line ℓ_0
22 : $P_{27} = (23, 1, 0, 0)$ lies on line ℓ_0
23 : $P_{28} = (24, 1, 0, 0)$ lies on line ℓ_0
24 : $P_{29} = (25, 1, 0, 0)$ lies on line ℓ_0
25 : $P_{30} = (26, 1, 0, 0)$ lies on line ℓ_0
26 : $P_{31} = (27, 1, 0, 0)$ lies on line ℓ_0
27 : $P_{32} = (28, 1, 0, 0)$ lies on line ℓ_0
28 : $P_{33} = (29, 1, 0, 0)$ lies on line ℓ_0
29 : $P_{34} = (30, 1, 0, 0)$ lies on line ℓ_0
30 : $P_{35} = (31, 1, 0, 0)$ lies on line ℓ_0
31 : $P_{36} = (32, 1, 0, 0)$ lies on line ℓ_0
32 : $P_{37} = (33, 1, 0, 0)$ lies on line ℓ_0
33 : $P_{38} = (34, 1, 0, 0)$ lies on line ℓ_0
34 : $P_{39} = (35, 1, 0, 0)$ lies on line ℓ_0
35 : $P_{40} = (36, 1, 0, 0)$ lies on line ℓ_0
36 : $P_{41} = (37, 1, 0, 0)$ lies on line ℓ_0
37 : $P_{42} = (38, 1, 0, 0)$ lies on line ℓ_0
38 : $P_{43} = (39, 1, 0, 0)$ lies on line ℓ_0
39 : $P_{44} = (40, 1, 0, 0)$ lies on line ℓ_0
40 : $P_{45} = (41, 1, 0, 0)$ lies on line ℓ_0
41 : $P_{46} = (42, 1, 0, 0)$ lies on line ℓ_0
42 : $P_{47} = (43, 1, 0, 0)$ lies on line ℓ_0
43 : $P_{48} = (44, 1, 0, 0)$ lies on line ℓ_0
44 : $P_{49} = (45, 1, 0, 0)$ lies on line ℓ_0
45 : $P_{50} = (46, 1, 0, 0)$ lies on line ℓ_0
46 : $P_{51} = (47, 1, 0, 0)$ lies on line ℓ_0
47 : $P_{52} = (48, 1, 0, 0)$ lies on line ℓ_0
48 : $P_{53} = (49, 1, 0, 0)$ lies on line ℓ_0
49 : $P_{54} = (50, 1, 0, 0)$ lies on line ℓ_0
50 : $P_{55} = (51, 1, 0, 0)$ lies on line ℓ_0
51 : $P_{56} = (52, 1, 0, 0)$ lies on line ℓ_0
52 : $P_{57} = (53, 1, 0, 0)$ lies on line ℓ_0
53 : $P_{58} = (54, 1, 0, 0)$ lies on line ℓ_0
54 : $P_{59} = (55, 1, 0, 0)$ lies on line ℓ_0
55 : $P_{60} = (56, 1, 0, 0)$ lies on line ℓ_0
56 : $P_{61} = (57, 1, 0, 0)$ lies on line ℓ_0
57 : $P_{62} = (58, 1, 0, 0)$ lies on line ℓ_0
58 : $P_{63} = (59, 1, 0, 0)$ lies on line ℓ_0
59 : $P_{64} = (60, 1, 0, 0)$ lies on line ℓ_0
60 : $P_{65} = (61, 1, 0, 0)$ lies on line ℓ_0
61 : $P_{66} = (62, 1, 0, 0)$ lies on line ℓ_0
62 : $P_{67} = (63, 1, 0, 0)$ lies on line ℓ_0
63 : $P_{69} = (2, 0, 1, 0)$ lies on line ℓ_1
64 : $P_{70} = (3, 0, 1, 0)$ lies on line ℓ_1
65 : $P_{71} = (4, 0, 1, 0)$ lies on line ℓ_1
66 : $P_{72} = (5, 0, 1, 0)$ lies on line ℓ_1
67 : $P_{73} = (6, 0, 1, 0)$ lies on line ℓ_1
68 : $P_{74} = (7, 0, 1, 0)$ lies on line ℓ_1
69 : $P_{75} = (8, 0, 1, 0)$ lies on line ℓ_1
70 : $P_{76} = (9, 0, 1, 0)$ lies on line ℓ_1
71 : $P_{77} = (10, 0, 1, 0)$ lies on line ℓ_1
72 : $P_{78} = (11, 0, 1, 0)$ lies on line ℓ_1
73 : $P_{79} = (12, 0, 1, 0)$ lies on line ℓ_1
74 : $P_{80} = (13, 0, 1, 0)$ lies on line ℓ_1
75 : $P_{81} = (14, 0, 1, 0)$ lies on line ℓ_1
76 : $P_{82} = (15, 0, 1, 0)$ lies on line ℓ_1
77 : $P_{83} = (16, 0, 1, 0)$ lies on line ℓ_1
78 : $P_{84} = (17, 0, 1, 0)$ lies on line ℓ_1
79 : $P_{85} = (18, 0, 1, 0)$ lies on line ℓ_1
80 : $P_{86} = (19, 0, 1, 0)$ lies on line ℓ_1
81 : $P_{87} = (20, 0, 1, 0)$ lies on line ℓ_1
82 : $P_{88} = (21, 0, 1, 0)$ lies on line ℓ_1
83 : $P_{89} = (22, 0, 1, 0)$ lies on line ℓ_1
84 : $P_{90} = (23, 0, 1, 0)$ lies on line ℓ_1
85 : $P_{91} = (24, 0, 1, 0)$ lies on line ℓ_1
86 : $P_{92} = (25, 0, 1, 0)$ lies on line ℓ_1
87 : $P_{93} = (26, 0, 1, 0)$ lies on line ℓ_1
88 : $P_{94} = (27, 0, 1, 0)$ lies on line ℓ_1
89 : $P_{95} = (28, 0, 1, 0)$ lies on line ℓ_1
90 : $P_{96} = (29, 0, 1, 0)$ lies on line ℓ_1
91 : $P_{97} = (30, 0, 1, 0)$ lies on line ℓ_1
92 : $P_{98} = (31, 0, 1, 0)$ lies on line ℓ_1
93 : $P_{99} = (32, 0, 1, 0)$ lies on line ℓ_1
94 : $P_{100} = (33, 0, 1, 0)$ lies on line ℓ_1
95 : $P_{101} = (34, 0, 1, 0)$ lies on line ℓ_1
96 : $P_{102} = (35, 0, 1, 0)$ lies on line ℓ_1
97 : $P_{103} = (36, 0, 1, 0)$ lies on line ℓ_1
98 : $P_{104} = (37, 0, 1, 0)$ lies on line ℓ_1
99 : $P_{105} = (38, 0, 1, 0)$ lies on line ℓ_1
100 : $P_{106} = (39, 0, 1, 0)$ lies on line ℓ_1
101 : $P_{107} = (40, 0, 1, 0)$ lies on line ℓ_1
102 : $P_{108} = (41, 0, 1, 0)$ lies on line ℓ_1
103 : $P_{109} = (42, 0, 1, 0)$ lies on line ℓ_1
104 : $P_{110} = (43, 0, 1, 0)$ lies on line ℓ_1
105 : $P_{111} = (44, 0, 1, 0)$ lies on line ℓ_1
106 : $P_{112} = (45, 0, 1, 0)$ lies on line ℓ_1
107 : $P_{113} = (46, 0, 1, 0)$ lies on line ℓ_1
108 : $P_{114} = (47, 0, 1, 0)$ lies on line ℓ_1
109 : $P_{115} = (48, 0, 1, 0)$ lies on line ℓ_1
110 : $P_{116} = (49, 0, 1, 0)$ lies on line ℓ_1
111 : $P_{117} = (50, 0, 1, 0)$ lies on line ℓ_1
112 : $P_{118} = (51, 0, 1, 0)$ lies on line ℓ_1
113 : $P_{119} = (52, 0, 1, 0)$ lies on line ℓ_1
114 : $P_{120} = (53, 0, 1, 0)$ lies on line ℓ_1
115 : $P_{121} = (54, 0, 1, 0)$ lies on line ℓ_1
116 : $P_{122} = (55, 0, 1, 0)$ lies on line ℓ_1
117 : $P_{123} = (56, 0, 1, 0)$ lies on line ℓ_1
118 : $P_{124} = (57, 0, 1, 0)$ lies on line ℓ_1
119 : $P_{125} = (58, 0, 1, 0)$ lies on line ℓ_1
120 : $P_{126} = (59, 0, 1, 0)$ lies on line ℓ_1
121 : $P_{127} = (60, 0, 1, 0)$ lies on line ℓ_1
122 : $P_{128} = (61, 0, 1, 0)$ lies on line ℓ_1
123 : $P_{129} = (62, 0, 1, 0)$ lies on line ℓ_1
124 : $P_{130} = (63, 0, 1, 0)$ lies on line ℓ_1
125 : $P_{197} = (2, 2, 1, 0)$ lies on line ℓ_2

126 : $P_{262} = (3, 3, 1, 0)$ lies on line ℓ_2
127 : $P_{327} = (4, 4, 1, 0)$ lies on line ℓ_2
128 : $P_{392} = (5, 5, 1, 0)$ lies on line ℓ_2
129 : $P_{457} = (6, 6, 1, 0)$ lies on line ℓ_2
130 : $P_{522} = (7, 7, 1, 0)$ lies on line ℓ_2
131 : $P_{587} = (8, 8, 1, 0)$ lies on line ℓ_2
132 : $P_{652} = (9, 9, 1, 0)$ lies on line ℓ_2
133 : $P_{717} = (10, 10, 1, 0)$ lies on line ℓ_2
134 : $P_{782} = (11, 11, 1, 0)$ lies on line ℓ_2
135 : $P_{847} = (12, 12, 1, 0)$ lies on line ℓ_2
136 : $P_{912} = (13, 13, 1, 0)$ lies on line ℓ_2
137 : $P_{977} = (14, 14, 1, 0)$ lies on line ℓ_2
138 : $P_{1042} = (15, 15, 1, 0)$ lies on line ℓ_2
139 : $P_{1107} = (16, 16, 1, 0)$ lies on line ℓ_2
140 : $P_{1172} = (17, 17, 1, 0)$ lies on line ℓ_2
141 : $P_{1237} = (18, 18, 1, 0)$ lies on line ℓ_2
142 : $P_{1302} = (19, 19, 1, 0)$ lies on line ℓ_2
143 : $P_{1367} = (20, 20, 1, 0)$ lies on line ℓ_2
144 : $P_{1432} = (21, 21, 1, 0)$ lies on line ℓ_2
145 : $P_{1497} = (22, 22, 1, 0)$ lies on line ℓ_2
146 : $P_{1562} = (23, 23, 1, 0)$ lies on line ℓ_2
147 : $P_{1627} = (24, 24, 1, 0)$ lies on line ℓ_2
148 : $P_{1692} = (25, 25, 1, 0)$ lies on line ℓ_2
149 : $P_{1757} = (26, 26, 1, 0)$ lies on line ℓ_2
150 : $P_{1822} = (27, 27, 1, 0)$ lies on line ℓ_2
151 : $P_{1887} = (28, 28, 1, 0)$ lies on line ℓ_2
152 : $P_{1952} = (29, 29, 1, 0)$ lies on line ℓ_2
153 : $P_{2017} = (30, 30, 1, 0)$ lies on line ℓ_2
154 : $P_{2082} = (31, 31, 1, 0)$ lies on line ℓ_2
155 : $P_{2147} = (32, 32, 1, 0)$ lies on line ℓ_2
156 : $P_{2212} = (33, 33, 1, 0)$ lies on line ℓ_2
157 : $P_{2277} = (34, 34, 1, 0)$ lies on line ℓ_2
158 : $P_{2342} = (35, 35, 1, 0)$ lies on line ℓ_2
159 : $P_{2407} = (36, 36, 1, 0)$ lies on line ℓ_2
160 : $P_{2472} = (37, 37, 1, 0)$ lies on line ℓ_2
161 : $P_{2537} = (38, 38, 1, 0)$ lies on line ℓ_2
162 : $P_{2602} = (39, 39, 1, 0)$ lies on line ℓ_2
163 : $P_{2667} = (40, 40, 1, 0)$ lies on line ℓ_2
164 : $P_{2732} = (41, 41, 1, 0)$ lies on line ℓ_2
165 : $P_{2797} = (42, 42, 1, 0)$ lies on line ℓ_2
166 : $P_{2862} = (43, 43, 1, 0)$ lies on line ℓ_2
167 : $P_{2927} = (44, 44, 1, 0)$ lies on line ℓ_2
168 : $P_{2992} = (45, 45, 1, 0)$ lies on line ℓ_2
169 : $P_{3057} = (46, 46, 1, 0)$ lies on line ℓ_2
170 : $P_{3122} = (47, 47, 1, 0)$ lies on line ℓ_2
171 : $P_{3187} = (48, 48, 1, 0)$ lies on line ℓ_2
172 : $P_{3252} = (49, 49, 1, 0)$ lies on line ℓ_2
173 : $P_{3317} = (50, 50, 1, 0)$ lies on line ℓ_2
174 : $P_{3382} = (51, 51, 1, 0)$ lies on line ℓ_2
175 : $P_{3447} = (52, 52, 1, 0)$ lies on line ℓ_2
176 : $P_{3512} = (53, 53, 1, 0)$ lies on line ℓ_2
177 : $P_{3577} = (54, 54, 1, 0)$ lies on line ℓ_2
178 : $P_{3642} = (55, 55, 1, 0)$ lies on line ℓ_2
179 : $P_{3707} = (56, 56, 1, 0)$ lies on line ℓ_2
180 : $P_{3772} = (57, 57, 1, 0)$ lies on line ℓ_2
181 : $P_{3837} = (58, 58, 1, 0)$ lies on line ℓ_2
182 : $P_{3902} = (59, 59, 1, 0)$ lies on line ℓ_2
183 : $P_{3967} = (60, 60, 1, 0)$ lies on line ℓ_2
184 : $P_{4032} = (61, 61, 1, 0)$ lies on line ℓ_2
185 : $P_{4097} = (62, 62, 1, 0)$ lies on line ℓ_2
186 : $P_{4162} = (63, 63, 1, 0)$ lies on line ℓ_2
187 : $P_{4291} = (1, 2, 0, 1)$ lies on line ℓ_3
188 : $P_{4355} = (1, 3, 0, 1)$ lies on line ℓ_3
189 : $P_{4419} = (1, 4, 0, 1)$ lies on line ℓ_3
190 : $P_{4483} = (1, 5, 0, 1)$ lies on line ℓ_3
191 : $P_{4547} = (1, 6, 0, 1)$ lies on line ℓ_3
192 : $P_{4611} = (1, 7, 0, 1)$ lies on line ℓ_3
193 : $P_{4675} = (1, 8, 0, 1)$ lies on line ℓ_3
194 : $P_{4739} = (1, 9, 0, 1)$ lies on line ℓ_3
195 : $P_{4803} = (1, 10, 0, 1)$ lies on line ℓ_3
196 : $P_{4867} = (1, 11, 0, 1)$ lies on line ℓ_3
197 : $P_{4931} = (1, 12, 0, 1)$ lies on line ℓ_3
198 : $P_{4995} = (1, 13, 0, 1)$ lies on line ℓ_3
199 : $P_{5059} = (1, 14, 0, 1)$ lies on line ℓ_3
200 : $P_{5123} = (1, 15, 0, 1)$ lies on line ℓ_3
201 : $P_{5187} = (1, 16, 0, 1)$ lies on line ℓ_3
202 : $P_{5251} = (1, 17, 0, 1)$ lies on line ℓ_3
203 : $P_{5315} = (1, 18, 0, 1)$ lies on line ℓ_3
204 : $P_{5379} = (1, 19, 0, 1)$ lies on line ℓ_3
205 : $P_{5443} = (1, 20, 0, 1)$ lies on line ℓ_3
206 : $P_{5507} = (1, 21, 0, 1)$ lies on line ℓ_3
207 : $P_{5571} = (1, 22, 0, 1)$ lies on line ℓ_3
208 : $P_{5635} = (1, 23, 0, 1)$ lies on line ℓ_3
209 : $P_{5699} = (1, 24, 0, 1)$ lies on line ℓ_3
210 : $P_{5763} = (1, 25, 0, 1)$ lies on line ℓ_3
211 : $P_{5827} = (1, 26, 0, 1)$ lies on line ℓ_3
212 : $P_{5891} = (1, 27, 0, 1)$ lies on line ℓ_3
213 : $P_{5955} = (1, 28, 0, 1)$ lies on line ℓ_3
214 : $P_{6019} = (1, 29, 0, 1)$ lies on line ℓ_3
215 : $P_{6083} = (1, 30, 0, 1)$ lies on line ℓ_3
216 : $P_{6147} = (1, 31, 0, 1)$ lies on line ℓ_3
217 : $P_{6211} = (1, 32, 0, 1)$ lies on line ℓ_3
218 : $P_{6275} = (1, 33, 0, 1)$ lies on line ℓ_3
219 : $P_{6339} = (1, 34, 0, 1)$ lies on line ℓ_3
220 : $P_{6403} = (1, 35, 0, 1)$ lies on line ℓ_3
221 : $P_{6467} = (1, 36, 0, 1)$ lies on line ℓ_3
222 : $P_{6531} = (1, 37, 0, 1)$ lies on line ℓ_3
223 : $P_{6595} = (1, 38, 0, 1)$ lies on line ℓ_3
224 : $P_{6659} = (1, 39, 0, 1)$ lies on line ℓ_3
225 : $P_{6723} = (1, 40, 0, 1)$ lies on line ℓ_3
226 : $P_{6787} = (1, 41, 0, 1)$ lies on line ℓ_3
227 : $P_{6851} = (1, 42, 0, 1)$ lies on line ℓ_3
228 : $P_{6915} = (1, 43, 0, 1)$ lies on line ℓ_3
229 : $P_{6979} = (1, 44, 0, 1)$ lies on line ℓ_3
230 : $P_{7043} = (1, 45, 0, 1)$ lies on line ℓ_3
231 : $P_{7107} = (1, 46, 0, 1)$ lies on line ℓ_3
232 : $P_{7171} = (1, 47, 0, 1)$ lies on line ℓ_3
233 : $P_{7235} = (1, 48, 0, 1)$ lies on line ℓ_3

234 : $P_{7299} = (1, 49, 0, 1)$ lies on line ℓ_3
235 : $P_{7363} = (1, 50, 0, 1)$ lies on line ℓ_3
236 : $P_{7427} = (1, 51, 0, 1)$ lies on line ℓ_3
237 : $P_{7491} = (1, 52, 0, 1)$ lies on line ℓ_3
238 : $P_{7555} = (1, 53, 0, 1)$ lies on line ℓ_3
239 : $P_{7619} = (1, 54, 0, 1)$ lies on line ℓ_3
240 : $P_{7683} = (1, 55, 0, 1)$ lies on line ℓ_3
241 : $P_{7747} = (1, 56, 0, 1)$ lies on line ℓ_3
242 : $P_{7811} = (1, 57, 0, 1)$ lies on line ℓ_3
243 : $P_{7875} = (1, 58, 0, 1)$ lies on line ℓ_3
244 : $P_{7939} = (1, 59, 0, 1)$ lies on line ℓ_3
245 : $P_{8003} = (1, 60, 0, 1)$ lies on line ℓ_3
246 : $P_{8067} = (1, 61, 0, 1)$ lies on line ℓ_3
247 : $P_{8131} = (1, 62, 0, 1)$ lies on line ℓ_3
248 : $P_{8195} = (1, 63, 0, 1)$ lies on line ℓ_3
249 : $P_{8259} = (1, 0, 1, 1)$ lies on line ℓ_5
250 : $P_{12354} = (1, 0, 2, 1)$ lies on line ℓ_5
251 : $P_{12418} = (1, 1, 2, 1)$ lies on line ℓ_4
252 : $P_{12420} = (3, 1, 2, 1)$ lies on line ℓ_6
253 : $P_{12484} = (3, 2, 2, 1)$ lies on line ℓ_7
254 : $P_{16450} = (1, 0, 3, 1)$ lies on line ℓ_5
255 : $P_{16514} = (1, 1, 3, 1)$ lies on line ℓ_4
256 : $P_{16515} = (2, 1, 3, 1)$ lies on line ℓ_6
257 : $P_{16643} = (2, 3, 3, 1)$ lies on line ℓ_7
258 : $P_{20546} = (1, 0, 4, 1)$ lies on line ℓ_5
259 : $P_{20610} = (1, 1, 4, 1)$ lies on line ℓ_4
260 : $P_{20614} = (5, 1, 4, 1)$ lies on line ℓ_6
261 : $P_{20806} = (5, 4, 4, 1)$ lies on line ℓ_7
262 : $P_{24642} = (1, 0, 5, 1)$ lies on line ℓ_5
263 : $P_{24706} = (1, 1, 5, 1)$ lies on line ℓ_4
264 : $P_{24709} = (4, 1, 5, 1)$ lies on line ℓ_6
265 : $P_{24965} = (4, 5, 5, 1)$ lies on line ℓ_7
266 : $P_{28738} = (1, 0, 6, 1)$ lies on line ℓ_5
267 : $P_{28802} = (1, 1, 6, 1)$ lies on line ℓ_4
268 : $P_{28808} = (7, 1, 6, 1)$ lies on line ℓ_6
269 : $P_{29128} = (7, 6, 6, 1)$ lies on line ℓ_7
270 : $P_{32834} = (1, 0, 7, 1)$ lies on line ℓ_5
271 : $P_{32898} = (1, 1, 7, 1)$ lies on line ℓ_4
272 : $P_{32903} = (6, 1, 7, 1)$ lies on line ℓ_6
273 : $P_{33287} = (6, 7, 7, 1)$ lies on line ℓ_7
274 : $P_{36930} = (1, 0, 8, 1)$ lies on line ℓ_5
275 : $P_{36994} = (1, 1, 8, 1)$ lies on line ℓ_4
276 : $P_{37002} = (9, 1, 8, 1)$ lies on line ℓ_6
277 : $P_{37450} = (9, 8, 8, 1)$ lies on line ℓ_7
278 : $P_{41026} = (1, 0, 9, 1)$ lies on line ℓ_5
279 : $P_{41090} = (1, 1, 9, 1)$ lies on line ℓ_4
280 : $P_{41097} = (8, 1, 9, 1)$ lies on line ℓ_6
281 : $P_{41609} = (8, 9, 9, 1)$ lies on line ℓ_7
282 : $P_{45122} = (1, 0, 10, 1)$ lies on line ℓ_5
283 : $P_{45186} = (1, 1, 10, 1)$ lies on line ℓ_4
284 : $P_{45196} = (11, 1, 10, 1)$ lies on line ℓ_6
285 : $P_{45772} = (11, 10, 10, 1)$ lies on line ℓ_7
286 : $P_{49218} = (1, 0, 11, 1)$ lies on line ℓ_5
287 : $P_{49282} = (1, 1, 11, 1)$ lies on line ℓ_4
288 : $P_{49291} = (10, 1, 11, 1)$ lies on line ℓ_6
289 : $P_{49931} = (10, 11, 11, 1)$ lies on line ℓ_7
290 : $P_{53314} = (1, 0, 12, 1)$ lies on line ℓ_5
291 : $P_{53378} = (1, 1, 12, 1)$ lies on line ℓ_4
292 : $P_{53390} = (13, 1, 12, 1)$ lies on line ℓ_6
293 : $P_{54094} = (13, 12, 12, 1)$ lies on line ℓ_7
294 : $P_{57410} = (1, 0, 13, 1)$ lies on line ℓ_5
295 : $P_{57474} = (1, 1, 13, 1)$ lies on line ℓ_4
296 : $P_{57485} = (12, 1, 13, 1)$ lies on line ℓ_6
297 : $P_{58253} = (12, 13, 13, 1)$ lies on line ℓ_7
298 : $P_{61506} = (1, 0, 14, 1)$ lies on line ℓ_5
299 : $P_{61570} = (1, 1, 14, 1)$ lies on line ℓ_4
300 : $P_{61584} = (15, 1, 14, 1)$ lies on line ℓ_6
301 : $P_{62416} = (15, 14, 14, 1)$ lies on line ℓ_7
302 : $P_{65602} = (1, 0, 15, 1)$ lies on line ℓ_5
303 : $P_{65666} = (1, 1, 15, 1)$ lies on line ℓ_4
304 : $P_{65679} = (14, 1, 15, 1)$ lies on line ℓ_6
305 : $P_{66575} = (14, 15, 15, 1)$ lies on line ℓ_7
306 : $P_{69698} = (1, 0, 16, 1)$ lies on line ℓ_5
307 : $P_{69762} = (1, 1, 16, 1)$ lies on line ℓ_4
308 : $P_{69778} = (17, 1, 16, 1)$ lies on line ℓ_6
309 : $P_{70738} = (17, 16, 16, 1)$ lies on line ℓ_7
310 : $P_{73794} = (1, 0, 17, 1)$ lies on line ℓ_5
311 : $P_{73858} = (1, 1, 17, 1)$ lies on line ℓ_4
312 : $P_{73873} = (16, 1, 17, 1)$ lies on line ℓ_6
313 : $P_{74897} = (16, 17, 17, 1)$ lies on line ℓ_7
314 : $P_{77890} = (1, 0, 18, 1)$ lies on line ℓ_5
315 : $P_{77954} = (1, 1, 18, 1)$ lies on line ℓ_4
316 : $P_{77972} = (19, 1, 18, 1)$ lies on line ℓ_6
317 : $P_{79060} = (19, 18, 18, 1)$ lies on line ℓ_7
318 : $P_{81986} = (1, 0, 19, 1)$ lies on line ℓ_5
319 : $P_{82050} = (1, 1, 19, 1)$ lies on line ℓ_4
320 : $P_{82067} = (18, 1, 19, 1)$ lies on line ℓ_6
321 : $P_{83219} = (18, 19, 19, 1)$ lies on line ℓ_7
322 : $P_{86082} = (1, 0, 20, 1)$ lies on line ℓ_5
323 : $P_{86146} = (1, 1, 20, 1)$ lies on line ℓ_4
324 : $P_{86166} = (21, 1, 20, 1)$ lies on line ℓ_6
325 : $P_{87382} = (21, 20, 20, 1)$ lies on line ℓ_7
326 : $P_{90178} = (1, 0, 21, 1)$ lies on line ℓ_5
327 : $P_{90242} = (1, 1, 21, 1)$ lies on line ℓ_4
328 : $P_{90261} = (20, 1, 21, 1)$ lies on line ℓ_6
329 : $P_{91541} = (20, 21, 21, 1)$ lies on line ℓ_7
330 : $P_{94274} = (1, 0, 22, 1)$ lies on line ℓ_5
331 : $P_{94338} = (1, 1, 22, 1)$ lies on line ℓ_4
332 : $P_{94360} = (23, 1, 22, 1)$ lies on line ℓ_6
333 : $P_{95704} = (23, 22, 22, 1)$ lies on line ℓ_7
334 : $P_{98370} = (1, 0, 23, 1)$ lies on line ℓ_5
335 : $P_{98434} = (1, 1, 23, 1)$ lies on line ℓ_4
336 : $P_{98455} = (22, 1, 23, 1)$ lies on line ℓ_6
337 : $P_{99863} = (22, 23, 23, 1)$ lies on line ℓ_7
338 : $P_{102466} = (1, 0, 24, 1)$ lies on line ℓ_5
339 : $P_{102530} = (1, 1, 24, 1)$ lies on line ℓ_4
340 : $P_{102554} = (25, 1, 24, 1)$ lies on line ℓ_6
341 : $P_{104026} = (25, 24, 24, 1)$ lies on line ℓ_7

342 : $P_{106562} = (1, 0, 25, 1)$ lies on line ℓ_5
343 : $P_{106626} = (1, 1, 25, 1)$ lies on line ℓ_4
344 : $P_{106649} = (24, 1, 25, 1)$ lies on line ℓ_6
345 : $P_{108185} = (24, 25, 25, 1)$ lies on line ℓ_7
346 : $P_{110658} = (1, 0, 26, 1)$ lies on line ℓ_5
347 : $P_{110722} = (1, 1, 26, 1)$ lies on line ℓ_4
348 : $P_{110748} = (27, 1, 26, 1)$ lies on line ℓ_6
349 : $P_{112348} = (27, 26, 26, 1)$ lies on line ℓ_7
350 : $P_{114754} = (1, 0, 27, 1)$ lies on line ℓ_5
351 : $P_{114818} = (1, 1, 27, 1)$ lies on line ℓ_4
352 : $P_{114843} = (26, 1, 27, 1)$ lies on line ℓ_6
353 : $P_{116507} = (26, 27, 27, 1)$ lies on line ℓ_7
354 : $P_{118850} = (1, 0, 28, 1)$ lies on line ℓ_5
355 : $P_{118914} = (1, 1, 28, 1)$ lies on line ℓ_4
356 : $P_{118942} = (29, 1, 28, 1)$ lies on line ℓ_6
357 : $P_{120670} = (29, 28, 28, 1)$ lies on line ℓ_7
358 : $P_{122946} = (1, 0, 29, 1)$ lies on line ℓ_5
359 : $P_{123010} = (1, 1, 29, 1)$ lies on line ℓ_4
360 : $P_{123037} = (28, 1, 29, 1)$ lies on line ℓ_6
361 : $P_{124829} = (28, 29, 29, 1)$ lies on line ℓ_7
362 : $P_{127042} = (1, 0, 30, 1)$ lies on line ℓ_5
363 : $P_{127106} = (1, 1, 30, 1)$ lies on line ℓ_4
364 : $P_{127136} = (31, 1, 30, 1)$ lies on line ℓ_6
365 : $P_{128992} = (31, 30, 30, 1)$ lies on line ℓ_7
366 : $P_{131138} = (1, 0, 31, 1)$ lies on line ℓ_5
367 : $P_{131202} = (1, 1, 31, 1)$ lies on line ℓ_4
368 : $P_{131231} = (30, 1, 31, 1)$ lies on line ℓ_6
369 : $P_{133151} = (30, 31, 31, 1)$ lies on line ℓ_7
370 : $P_{135234} = (1, 0, 32, 1)$ lies on line ℓ_5
371 : $P_{135298} = (1, 1, 32, 1)$ lies on line ℓ_4
372 : $P_{135330} = (33, 1, 32, 1)$ lies on line ℓ_6
373 : $P_{137314} = (33, 32, 32, 1)$ lies on line ℓ_7
374 : $P_{139330} = (1, 0, 33, 1)$ lies on line ℓ_5
375 : $P_{139394} = (1, 1, 33, 1)$ lies on line ℓ_4
376 : $P_{139425} = (32, 1, 33, 1)$ lies on line ℓ_6
377 : $P_{141473} = (32, 33, 33, 1)$ lies on line ℓ_7
378 : $P_{143426} = (1, 0, 34, 1)$ lies on line ℓ_5
379 : $P_{143490} = (1, 1, 34, 1)$ lies on line ℓ_4
380 : $P_{143524} = (35, 1, 34, 1)$ lies on line ℓ_6
381 : $P_{145636} = (35, 34, 34, 1)$ lies on line ℓ_7
382 : $P_{147522} = (1, 0, 35, 1)$ lies on line ℓ_5
383 : $P_{147586} = (1, 1, 35, 1)$ lies on line ℓ_4
384 : $P_{147619} = (34, 1, 35, 1)$ lies on line ℓ_6
385 : $P_{149795} = (34, 35, 35, 1)$ lies on line ℓ_7
386 : $P_{151618} = (1, 0, 36, 1)$ lies on line ℓ_5
387 : $P_{151682} = (1, 1, 36, 1)$ lies on line ℓ_4
388 : $P_{151718} = (37, 1, 36, 1)$ lies on line ℓ_6
389 : $P_{153958} = (37, 36, 36, 1)$ lies on line ℓ_7
390 : $P_{155714} = (1, 0, 37, 1)$ lies on line ℓ_5
391 : $P_{155778} = (1, 1, 37, 1)$ lies on line ℓ_4
392 : $P_{155813} = (36, 1, 37, 1)$ lies on line ℓ_6
393 : $P_{158117} = (36, 37, 37, 1)$ lies on line ℓ_7
394 : $P_{159810} = (1, 0, 38, 1)$ lies on line ℓ_5
395 : $P_{159874} = (1, 1, 38, 1)$ lies on line ℓ_4
396 : $P_{159912} = (39, 1, 38, 1)$ lies on line ℓ_6
397 : $P_{162280} = (39, 38, 38, 1)$ lies on line ℓ_7
398 : $P_{163906} = (1, 0, 39, 1)$ lies on line ℓ_5
399 : $P_{163970} = (1, 1, 39, 1)$ lies on line ℓ_4
400 : $P_{164007} = (38, 1, 39, 1)$ lies on line ℓ_6
401 : $P_{166439} = (38, 39, 39, 1)$ lies on line ℓ_7
402 : $P_{168002} = (1, 0, 40, 1)$ lies on line ℓ_5
403 : $P_{168066} = (1, 1, 40, 1)$ lies on line ℓ_4
404 : $P_{168106} = (41, 1, 40, 1)$ lies on line ℓ_6
405 : $P_{170602} = (41, 40, 40, 1)$ lies on line ℓ_7
406 : $P_{172098} = (1, 0, 41, 1)$ lies on line ℓ_5
407 : $P_{172162} = (1, 1, 41, 1)$ lies on line ℓ_4
408 : $P_{172201} = (40, 1, 41, 1)$ lies on line ℓ_6
409 : $P_{174761} = (40, 41, 41, 1)$ lies on line ℓ_7
410 : $P_{176194} = (1, 0, 42, 1)$ lies on line ℓ_5
411 : $P_{176258} = (1, 1, 42, 1)$ lies on line ℓ_4
412 : $P_{176300} = (43, 1, 42, 1)$ lies on line ℓ_6
413 : $P_{178924} = (43, 42, 42, 1)$ lies on line ℓ_7
414 : $P_{180290} = (1, 0, 43, 1)$ lies on line ℓ_5
415 : $P_{180354} = (1, 1, 43, 1)$ lies on line ℓ_4
416 : $P_{180395} = (42, 1, 43, 1)$ lies on line ℓ_6
417 : $P_{183083} = (42, 43, 43, 1)$ lies on line ℓ_7
418 : $P_{184386} = (1, 0, 44, 1)$ lies on line ℓ_5
419 : $P_{184450} = (1, 1, 44, 1)$ lies on line ℓ_4
420 : $P_{184494} = (45, 1, 44, 1)$ lies on line ℓ_6
421 : $P_{187246} = (45, 44, 44, 1)$ lies on line ℓ_7
422 : $P_{188482} = (1, 0, 45, 1)$ lies on line ℓ_5
423 : $P_{188546} = (1, 1, 45, 1)$ lies on line ℓ_4
424 : $P_{188589} = (44, 1, 45, 1)$ lies on line ℓ_6
425 : $P_{191405} = (44, 45, 45, 1)$ lies on line ℓ_7
426 : $P_{192578} = (1, 0, 46, 1)$ lies on line ℓ_5
427 : $P_{192642} = (1, 1, 46, 1)$ lies on line ℓ_4
428 : $P_{192688} = (47, 1, 46, 1)$ lies on line ℓ_6
429 : $P_{195568} = (47, 46, 46, 1)$ lies on line ℓ_7
430 : $P_{196674} = (1, 0, 47, 1)$ lies on line ℓ_5
431 : $P_{196738} = (1, 1, 47, 1)$ lies on line ℓ_4
432 : $P_{196783} = (46, 1, 47, 1)$ lies on line ℓ_6
433 : $P_{199727} = (46, 47, 47, 1)$ lies on line ℓ_7
434 : $P_{200770} = (1, 0, 48, 1)$ lies on line ℓ_5
435 : $P_{200834} = (1, 1, 48, 1)$ lies on line ℓ_4
436 : $P_{200882} = (49, 1, 48, 1)$ lies on line ℓ_6
437 : $P_{203890} = (49, 48, 48, 1)$ lies on line ℓ_7
438 : $P_{204866} = (1, 0, 49, 1)$ lies on line ℓ_5
439 : $P_{204930} = (1, 1, 49, 1)$ lies on line ℓ_4
440 : $P_{204977} = (48, 1, 49, 1)$ lies on line ℓ_6
441 : $P_{208049} = (48, 49, 49, 1)$ lies on line ℓ_7
442 : $P_{208962} = (1, 0, 50, 1)$ lies on line ℓ_5
443 : $P_{209026} = (1, 1, 50, 1)$ lies on line ℓ_4
444 : $P_{209076} = (51, 1, 50, 1)$ lies on line ℓ_6
445 : $P_{212212} = (51, 50, 50, 1)$ lies on line ℓ_7
446 : $P_{213058} = (1, 0, 51, 1)$ lies on line ℓ_5
447 : $P_{213122} = (1, 1, 51, 1)$ lies on line ℓ_4
448 : $P_{213171} = (50, 1, 51, 1)$ lies on line ℓ_6
449 : $P_{216371} = (50, 51, 51, 1)$ lies on line ℓ_7

450 : $P_{217154} = (1, 0, 52, 1)$ lies on line ℓ_5
451 : $P_{217218} = (1, 1, 52, 1)$ lies on line ℓ_4
452 : $P_{217270} = (53, 1, 52, 1)$ lies on line ℓ_6
453 : $P_{220534} = (53, 52, 52, 1)$ lies on line ℓ_7
454 : $P_{221250} = (1, 0, 53, 1)$ lies on line ℓ_5
455 : $P_{221314} = (1, 1, 53, 1)$ lies on line ℓ_4
456 : $P_{221365} = (52, 1, 53, 1)$ lies on line ℓ_6
457 : $P_{224693} = (52, 53, 53, 1)$ lies on line ℓ_7
458 : $P_{225346} = (1, 0, 54, 1)$ lies on line ℓ_5
459 : $P_{225410} = (1, 1, 54, 1)$ lies on line ℓ_4
460 : $P_{225464} = (55, 1, 54, 1)$ lies on line ℓ_6
461 : $P_{228856} = (55, 54, 54, 1)$ lies on line ℓ_7
462 : $P_{229442} = (1, 0, 55, 1)$ lies on line ℓ_5
463 : $P_{229506} = (1, 1, 55, 1)$ lies on line ℓ_4
464 : $P_{229559} = (54, 1, 55, 1)$ lies on line ℓ_6
465 : $P_{233015} = (54, 55, 55, 1)$ lies on line ℓ_7
466 : $P_{233538} = (1, 0, 56, 1)$ lies on line ℓ_5
467 : $P_{233602} = (1, 1, 56, 1)$ lies on line ℓ_4
468 : $P_{233658} = (57, 1, 56, 1)$ lies on line ℓ_6
469 : $P_{237178} = (57, 56, 56, 1)$ lies on line ℓ_7
470 : $P_{237634} = (1, 0, 57, 1)$ lies on line ℓ_5
471 : $P_{237698} = (1, 1, 57, 1)$ lies on line ℓ_4
472 : $P_{237753} = (56, 1, 57, 1)$ lies on line ℓ_6
473 : $P_{241337} = (56, 57, 57, 1)$ lies on line ℓ_7
474 : $P_{241730} = (1, 0, 58, 1)$ lies on line ℓ_5
475 : $P_{241794} = (1, 1, 58, 1)$ lies on line ℓ_4
476 : $P_{241852} = (59, 1, 58, 1)$ lies on line ℓ_6
477 : $P_{245500} = (59, 58, 58, 1)$ lies on line ℓ_7
478 : $P_{245826} = (1, 0, 59, 1)$ lies on line ℓ_5
479 : $P_{245890} = (1, 1, 59, 1)$ lies on line ℓ_4
480 : $P_{245947} = (58, 1, 59, 1)$ lies on line ℓ_6
481 : $P_{249659} = (58, 59, 59, 1)$ lies on line ℓ_7
482 : $P_{249922} = (1, 0, 60, 1)$ lies on line ℓ_5
483 : $P_{249986} = (1, 1, 60, 1)$ lies on line ℓ_4
484 : $P_{250046} = (61, 1, 60, 1)$ lies on line ℓ_6
485 : $P_{253822} = (61, 60, 60, 1)$ lies on line ℓ_7
486 : $P_{254018} = (1, 0, 61, 1)$ lies on line ℓ_5
487 : $P_{254082} = (1, 1, 61, 1)$ lies on line ℓ_4
488 : $P_{254141} = (60, 1, 61, 1)$ lies on line ℓ_6
489 : $P_{257981} = (60, 61, 61, 1)$ lies on line ℓ_7
490 : $P_{258114} = (1, 0, 62, 1)$ lies on line ℓ_5
491 : $P_{258178} = (1, 1, 62, 1)$ lies on line ℓ_4
492 : $P_{258240} = (63, 1, 62, 1)$ lies on line ℓ_6
493 : $P_{262144} = (63, 62, 62, 1)$ lies on line ℓ_7
494 : $P_{262210} = (1, 0, 63, 1)$ lies on line ℓ_5
495 : $P_{262274} = (1, 1, 63, 1)$ lies on line ℓ_4
496 : $P_{262335} = (62, 1, 63, 1)$ lies on line ℓ_6
497 : $P_{266303} = (62, 63, 63, 1)$ lies on line ℓ_7

The single points on the surface are:

Points on surface but on no line

The surface has 3782 points not on any line:
Too many to print.

Line Intersection Graph

	0 1 2 3 4 5 6 7
0	0 1 1 1 0 0 0 0
1	1 0 1 0 1 1 1 0
2	1 1 0 0 1 1 0 1
3	1 0 0 0 1 1 1 1
4	0 1 1 1 0 1 1 0
5	0 1 1 1 1 0 0 1
6	0 1 0 1 1 0 0 1
7	0 0 1 1 0 1 1 0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3
in point	P_0	P_5	P_1

Line 1 intersects

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

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_4	ℓ_5	ℓ_7
in point	P_5	P_2	P_2	P_2	P_{132}

Line 3 intersects

Line	ℓ_0	ℓ_4	ℓ_5	ℓ_6	ℓ_7
in point	P_1	P_{4227}	P_{4163}	P_{4227}	P_{4163}

Line 4 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_5	ℓ_6
in point	P_2	P_2	P_{4227}	P_2	P_{4227}

Line 5 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_7
in point	P_2	P_2	P_{4163}	P_2	P_{4163}

Line 6 intersects

Line	ℓ_1	ℓ_3	ℓ_4	ℓ_7
in point	P_{68}	P_{4227}	P_{4227}	P_{8322}

Line 7 intersects

Line	ℓ_2	ℓ_3	ℓ_5	ℓ_6
in point	P_{132}	P_{4163}	P_{4163}	P_{8322}

The surface has 4289 points:
Too many to print.