Rank-74499 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 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	2
Number of Eckardt points	1
Number of double points	5
Number of single points	438
Number of points off lines	3844
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^7
Type of lines on points	4, 3, 2^5, 1^{438}, 0^{3844}

Singular Points

The surface has 2 singular points:

$0: P_0 = \mathbf{P}(1,0,0,0) = \mathbf{P}(1,0,0,0)$
$1: P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$

The 7 Lines

The lines and their Pluecker coordinates are:

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

$$\ell_1 = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{4096} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{4096} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_2 = \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{8257} = \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{array}\right]_{8257} = \mathbf{Pl}(0,0,1,0,0,1)_{270528}$$

$$\ell_3 = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 \end{array}\right]_{65} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 \end{array}\right]_{65} = \mathbf{Pl}(1,0,1,0,1,0)_{4353}$$

$$\ell_4 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{17043457} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{17043457} = \mathbf{Pl}(0,0,0,1,0,1)_{278529}$$

$$\ell_5 = \left[\begin{array}{cccc} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17047616} = \left[\begin{array}{cccc} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array}\right]_{17047616} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

$$\ell_6 = \left[\begin{array}{cccc} 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{array}\right]_{274561} = \left[\begin{array}{cccc} 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{array}\right]_{274561} = \mathbf{Pl}(0,1,1,0,0,1)_{270592}$$

Rank of lines: (0, 4096, 8257, 65, 17043457, 17047616, 274561)
Rank of points on Klein quadric: (0, 2, 270528, 4353, 278529, 1, 270592)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_0 = \mathbf{P}(1,0,0,0) = \mathbf{P}(1,0,0,0)$.

Double Points

The surface has 5 Double points:
The double points on the surface are:

$P_5 = (1,1,0,0) = \ell_0 \cap \ell_2$ $P_4 = (1,1,1,1) = \ell_3 \cap \ell_6$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_4$ $P_{8258} = (0,0,1,1) = \ell_4 \cap \ell_5$
$P_{8322} = (0,1,1,1) = \ell_3 \cap \ell_4$

Single Points

The surface has 438 single points:
The single points on the surface are:

$0 : P_3 = (0,0,0,1)$ lies on line ℓ_5 $13 : P_{18} = (14,1,0,0)$ lies on line ℓ_0
$1 : P_6 = (2,1,0,0)$ lies on line ℓ_0 $14 : P_{19} = (15,1,0,0)$ lies on line ℓ_0
$2 : P_7 = (3,1,0,0)$ lies on line ℓ_0 $15 : P_{20} = (16,1,0,0)$ lies on line ℓ_0
$3 : P_8 = (4,1,0,0)$ lies on line ℓ_0 $16 : P_{21} = (17,1,0,0)$ lies on line ℓ_0
$4 : P_9 = (5,1,0,0)$ lies on line ℓ_0 $17 : P_{22} = (18,1,0,0)$ lies on line ℓ_0
$5 : P_{10} = (6,1,0,0)$ lies on line ℓ_0 $18 : P_{23} = (19,1,0,0)$ lies on line ℓ_0
$6 : P_{11} = (7,1,0,0)$ lies on line ℓ_0 $19 : P_{24} = (20,1,0,0)$ lies on line ℓ_0
$7 : P_{12} = (8,1,0,0)$ lies on line ℓ_0 $20 : P_{25} = (21,1,0,0)$ lies on line ℓ_0
$8 : P_{13} = (9,1,0,0)$ lies on line ℓ_0 $21 : P_{26} = (22,1,0,0)$ lies on line ℓ_0
$9 : P_{14} = (10,1,0,0)$ lies on line ℓ_0 $22 : P_{27} = (23,1,0,0)$ lies on line ℓ_0
$10 : P_{15} = (11,1,0,0)$ lies on line ℓ_0 $23 : P_{28} = (24,1,0,0)$ lies on line ℓ_0
$11 : P_{16} = (12,1,0,0)$ lies on line ℓ_0 $24 : P_{29} = (25,1,0,0)$ lies on line ℓ_0
$12 : P_{17} = (13,1,0,0)$ 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

$63: P_{68} = (1, 0, 1, 0)$ lies on line ℓ_1

$64: P_{69} = (2, 0, 1, 0)$ 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

$118: P_{123} = (56, 0, 1, 0)$ lies on line ℓ_1

$119: P_{124} = (57, 0, 1, 0)$ lies on line ℓ_1

$120: P_{125} = (58, 0, 1, 0)$ lies on line ℓ_1

$121: P_{126} = (59, 0, 1, 0)$ lies on line ℓ_1

$122: P_{127} = (60, 0, 1, 0)$ lies on line ℓ_1

$123: P_{128} = (61, 0, 1, 0)$ lies on line ℓ_1

$124: P_{129} = (62, 0, 1, 0)$ lies on line ℓ_1

$125: P_{130} = (63, 0, 1, 0)$ lies on line ℓ_1

$126: P_{132} = (1, 1, 1, 0)$ lies on line ℓ_2

$127: P_{197} = (2, 2, 1, 0)$ lies on line ℓ_2

$128: P_{262} = (3, 3, 1, 0)$ lies on line ℓ_2

$129: P_{327} = (4, 4, 1, 0)$ lies on line ℓ_2

$130: P_{392} = (5, 5, 1, 0)$ lies on line ℓ_2

$131: P_{457} = (6, 6, 1, 0)$ lies on line ℓ_2

$132: P_{522} = (7, 7, 1, 0)$ lies on line ℓ_2

$133: P_{587} = (8, 8, 1, 0)$ lies on line ℓ_2

134 : $P_{652} = (9, 9, 1, 0)$ lies on line ℓ_2
135 : $P_{717} = (10, 10, 1, 0)$ lies on line ℓ_2
136 : $P_{782} = (11, 11, 1, 0)$ lies on line ℓ_2
137 : $P_{847} = (12, 12, 1, 0)$ lies on line ℓ_2
138 : $P_{912} = (13, 13, 1, 0)$ lies on line ℓ_2
139 : $P_{977} = (14, 14, 1, 0)$ lies on line ℓ_2
140 : $P_{1042} = (15, 15, 1, 0)$ lies on line ℓ_2
141 : $P_{1107} = (16, 16, 1, 0)$ lies on line ℓ_2
142 : $P_{1172} = (17, 17, 1, 0)$ lies on line ℓ_2
143 : $P_{1237} = (18, 18, 1, 0)$ lies on line ℓ_2
144 : $P_{1302} = (19, 19, 1, 0)$ lies on line ℓ_2
145 : $P_{1367} = (20, 20, 1, 0)$ lies on line ℓ_2
146 : $P_{1432} = (21, 21, 1, 0)$ lies on line ℓ_2
147 : $P_{1497} = (22, 22, 1, 0)$ lies on line ℓ_2
148 : $P_{1562} = (23, 23, 1, 0)$ lies on line ℓ_2
149 : $P_{1627} = (24, 24, 1, 0)$ lies on line ℓ_2
150 : $P_{1692} = (25, 25, 1, 0)$ lies on line ℓ_2
151 : $P_{1757} = (26, 26, 1, 0)$ lies on line ℓ_2
152 : $P_{1822} = (27, 27, 1, 0)$ lies on line ℓ_2
153 : $P_{1887} = (28, 28, 1, 0)$ lies on line ℓ_2
154 : $P_{1952} = (29, 29, 1, 0)$ lies on line ℓ_2
155 : $P_{2017} = (30, 30, 1, 0)$ lies on line ℓ_2
156 : $P_{2082} = (31, 31, 1, 0)$ lies on line ℓ_2
157 : $P_{2147} = (32, 32, 1, 0)$ lies on line ℓ_2
158 : $P_{2212} = (33, 33, 1, 0)$ lies on line ℓ_2
159 : $P_{2277} = (34, 34, 1, 0)$ lies on line ℓ_2
160 : $P_{2342} = (35, 35, 1, 0)$ lies on line ℓ_2
161 : $P_{2407} = (36, 36, 1, 0)$ lies on line ℓ_2
162 : $P_{2472} = (37, 37, 1, 0)$ lies on line ℓ_2
163 : $P_{2537} = (38, 38, 1, 0)$ lies on line ℓ_2
164 : $P_{2602} = (39, 39, 1, 0)$ lies on line ℓ_2
165 : $P_{2667} = (40, 40, 1, 0)$ lies on line ℓ_2
166 : $P_{2732} = (41, 41, 1, 0)$ lies on line ℓ_2
167 : $P_{2797} = (42, 42, 1, 0)$ lies on line ℓ_2
168 : $P_{2862} = (43, 43, 1, 0)$ lies on line ℓ_2
169 : $P_{2927} = (44, 44, 1, 0)$ lies on line ℓ_2
170 : $P_{2992} = (45, 45, 1, 0)$ lies on line ℓ_2
171 : $P_{3057} = (46, 46, 1, 0)$ lies on line ℓ_2
172 : $P_{3122} = (47, 47, 1, 0)$ lies on line ℓ_2
173 : $P_{3187} = (48, 48, 1, 0)$ lies on line ℓ_2
174 : $P_{3252} = (49, 49, 1, 0)$ lies on line ℓ_2
175 : $P_{3317} = (50, 50, 1, 0)$ lies on line ℓ_2
176 : $P_{3382} = (51, 51, 1, 0)$ lies on line ℓ_2
177 : $P_{3447} = (52, 52, 1, 0)$ lies on line ℓ_2
178 : $P_{3512} = (53, 53, 1, 0)$ lies on line ℓ_2
179 : $P_{3577} = (54, 54, 1, 0)$ lies on line ℓ_2
180 : $P_{3642} = (55, 55, 1, 0)$ lies on line ℓ_2
181 : $P_{3707} = (56, 56, 1, 0)$ lies on line ℓ_2
182 : $P_{3772} = (57, 57, 1, 0)$ lies on line ℓ_2
183 : $P_{3837} = (58, 58, 1, 0)$ lies on line ℓ_2
184 : $P_{3902} = (59, 59, 1, 0)$ lies on line ℓ_2
185 : $P_{3967} = (60, 60, 1, 0)$ lies on line ℓ_2
186 : $P_{4032} = (61, 61, 1, 0)$ lies on line ℓ_2
187 : $P_{4097} = (62, 62, 1, 0)$ lies on line ℓ_2

188 : $P_{4162} = (63, 63, 1, 0)$ lies on line ℓ_2
189 : $P_{4227} = (1, 1, 0, 1)$ lies on line ℓ_6
190 : $P_{8323} = (2, 1, 1, 1)$ lies on line ℓ_3
191 : $P_{8324} = (3, 1, 1, 1)$ lies on line ℓ_3
192 : $P_{8325} = (4, 1, 1, 1)$ lies on line ℓ_3
193 : $P_{8326} = (5, 1, 1, 1)$ lies on line ℓ_3
194 : $P_{8327} = (6, 1, 1, 1)$ lies on line ℓ_3
195 : $P_{8328} = (7, 1, 1, 1)$ lies on line ℓ_3
196 : $P_{8329} = (8, 1, 1, 1)$ lies on line ℓ_3
197 : $P_{8330} = (9, 1, 1, 1)$ lies on line ℓ_3
198 : $P_{8331} = (10, 1, 1, 1)$ lies on line ℓ_3
199 : $P_{8332} = (11, 1, 1, 1)$ lies on line ℓ_3
200 : $P_{8333} = (12, 1, 1, 1)$ lies on line ℓ_3
201 : $P_{8334} = (13, 1, 1, 1)$ lies on line ℓ_3
202 : $P_{8335} = (14, 1, 1, 1)$ lies on line ℓ_3
203 : $P_{8336} = (15, 1, 1, 1)$ lies on line ℓ_3
204 : $P_{8337} = (16, 1, 1, 1)$ lies on line ℓ_3
205 : $P_{8338} = (17, 1, 1, 1)$ lies on line ℓ_3
206 : $P_{8339} = (18, 1, 1, 1)$ lies on line ℓ_3
207 : $P_{8340} = (19, 1, 1, 1)$ lies on line ℓ_3
208 : $P_{8341} = (20, 1, 1, 1)$ lies on line ℓ_3
209 : $P_{8342} = (21, 1, 1, 1)$ lies on line ℓ_3
210 : $P_{8343} = (22, 1, 1, 1)$ lies on line ℓ_3
211 : $P_{8344} = (23, 1, 1, 1)$ lies on line ℓ_3
212 : $P_{8345} = (24, 1, 1, 1)$ lies on line ℓ_3
213 : $P_{8346} = (25, 1, 1, 1)$ lies on line ℓ_3
214 : $P_{8347} = (26, 1, 1, 1)$ lies on line ℓ_3
215 : $P_{8348} = (27, 1, 1, 1)$ lies on line ℓ_3
216 : $P_{8349} = (28, 1, 1, 1)$ lies on line ℓ_3
217 : $P_{8350} = (29, 1, 1, 1)$ lies on line ℓ_3
218 : $P_{8351} = (30, 1, 1, 1)$ lies on line ℓ_3
219 : $P_{8352} = (31, 1, 1, 1)$ lies on line ℓ_3
220 : $P_{8353} = (32, 1, 1, 1)$ lies on line ℓ_3
221 : $P_{8354} = (33, 1, 1, 1)$ lies on line ℓ_3
222 : $P_{8355} = (34, 1, 1, 1)$ lies on line ℓ_3
223 : $P_{8356} = (35, 1, 1, 1)$ lies on line ℓ_3
224 : $P_{8357} = (36, 1, 1, 1)$ lies on line ℓ_3
225 : $P_{8358} = (37, 1, 1, 1)$ lies on line ℓ_3
226 : $P_{8359} = (38, 1, 1, 1)$ lies on line ℓ_3
227 : $P_{8360} = (39, 1, 1, 1)$ lies on line ℓ_3
228 : $P_{8361} = (40, 1, 1, 1)$ lies on line ℓ_3
229 : $P_{8362} = (41, 1, 1, 1)$ lies on line ℓ_3
230 : $P_{8363} = (42, 1, 1, 1)$ lies on line ℓ_3
231 : $P_{8364} = (43, 1, 1, 1)$ lies on line ℓ_3
232 : $P_{8365} = (44, 1, 1, 1)$ lies on line ℓ_3
233 : $P_{8366} = (45, 1, 1, 1)$ lies on line ℓ_3
234 : $P_{8367} = (46, 1, 1, 1)$ lies on line ℓ_3
235 : $P_{8368} = (47, 1, 1, 1)$ lies on line ℓ_3
236 : $P_{8369} = (48, 1, 1, 1)$ lies on line ℓ_3
237 : $P_{8370} = (49, 1, 1, 1)$ lies on line ℓ_3
238 : $P_{8371} = (50, 1, 1, 1)$ lies on line ℓ_3
239 : $P_{8372} = (51, 1, 1, 1)$ lies on line ℓ_3
240 : $P_{8373} = (52, 1, 1, 1)$ lies on line ℓ_3
241 : $P_{8374} = (53, 1, 1, 1)$ lies on line ℓ_3

$242 : P_{8375} = (54, 1, 1, 1)$ lies on line ℓ_3

$243 : P_{8376} = (55, 1, 1, 1)$ lies on line ℓ_3

$244 : P_{8377} = (56, 1, 1, 1)$ lies on line ℓ_3

$245 : P_{8378} = (57, 1, 1, 1)$ lies on line ℓ_3

$246 : P_{8379} = (58, 1, 1, 1)$ lies on line ℓ_3

$247 : P_{8380} = (59, 1, 1, 1)$ lies on line ℓ_3

$248 : P_{8381} = (60, 1, 1, 1)$ lies on line ℓ_3

$249 : P_{8382} = (61, 1, 1, 1)$ lies on line ℓ_3

$250 : P_{8383} = (62, 1, 1, 1)$ lies on line ℓ_3

$251 : P_{8384} = (63, 1, 1, 1)$ lies on line ℓ_3

$252 : P_{8385} = (0, 2, 1, 1)$ lies on line ℓ_4

$253 : P_{8449} = (0, 3, 1, 1)$ lies on line ℓ_4

$254 : P_{8513} = (0, 4, 1, 1)$ lies on line ℓ_4

$255 : P_{8577} = (0, 5, 1, 1)$ lies on line ℓ_4

$256 : P_{8641} = (0, 6, 1, 1)$ lies on line ℓ_4

$257 : P_{8705} = (0, 7, 1, 1)$ lies on line ℓ_4

$258 : P_{8769} = (0, 8, 1, 1)$ lies on line ℓ_4

$259 : P_{8833} = (0, 9, 1, 1)$ lies on line ℓ_4

$260 : P_{8897} = (0, 10, 1, 1)$ lies on line ℓ_4

$261 : P_{8961} = (0, 11, 1, 1)$ lies on line ℓ_4

$262 : P_{9025} = (0, 12, 1, 1)$ lies on line ℓ_4

$263 : P_{9089} = (0, 13, 1, 1)$ lies on line ℓ_4

$264 : P_{9153} = (0, 14, 1, 1)$ lies on line ℓ_4

$265 : P_{9217} = (0, 15, 1, 1)$ lies on line ℓ_4

$266 : P_{9281} = (0, 16, 1, 1)$ lies on line ℓ_4

$267 : P_{9345} = (0, 17, 1, 1)$ lies on line ℓ_4

$268 : P_{9409} = (0, 18, 1, 1)$ lies on line ℓ_4

$269 : P_{9473} = (0, 19, 1, 1)$ lies on line ℓ_4

$270 : P_{9537} = (0, 20, 1, 1)$ lies on line ℓ_4

$271 : P_{9601} = (0, 21, 1, 1)$ lies on line ℓ_4

$272 : P_{9665} = (0, 22, 1, 1)$ lies on line ℓ_4

$273 : P_{9729} = (0, 23, 1, 1)$ lies on line ℓ_4

$274 : P_{9793} = (0, 24, 1, 1)$ lies on line ℓ_4

$275 : P_{9857} = (0, 25, 1, 1)$ lies on line ℓ_4

$276 : P_{9921} = (0, 26, 1, 1)$ lies on line ℓ_4

$277 : P_{9985} = (0, 27, 1, 1)$ lies on line ℓ_4

$278 : P_{10049} = (0, 28, 1, 1)$ lies on line ℓ_4

$279 : P_{10113} = (0, 29, 1, 1)$ lies on line ℓ_4

$280 : P_{10177} = (0, 30, 1, 1)$ lies on line ℓ_4

$281 : P_{10241} = (0, 31, 1, 1)$ lies on line ℓ_4

$282 : P_{10305} = (0, 32, 1, 1)$ lies on line ℓ_4

$283 : P_{10369} = (0, 33, 1, 1)$ lies on line ℓ_4

$284 : P_{10433} = (0, 34, 1, 1)$ lies on line ℓ_4

$285 : P_{10497} = (0, 35, 1, 1)$ lies on line ℓ_4

$286 : P_{10561} = (0, 36, 1, 1)$ lies on line ℓ_4

$287 : P_{10625} = (0, 37, 1, 1)$ lies on line ℓ_4

$288 : P_{10689} = (0, 38, 1, 1)$ lies on line ℓ_4

$289 : P_{10753} = (0, 39, 1, 1)$ lies on line ℓ_4

$290 : P_{10817} = (0, 40, 1, 1)$ lies on line ℓ_4

$291 : P_{10881} = (0, 41, 1, 1)$ lies on line ℓ_4

$292 : P_{10945} = (0, 42, 1, 1)$ lies on line ℓ_4

$293 : P_{11009} = (0, 43, 1, 1)$ lies on line ℓ_4

$294 : P_{11073} = (0, 44, 1, 1)$ lies on line ℓ_4

$295 : P_{11137} = (0, 45, 1, 1)$ lies on line ℓ_4

$296 : P_{11201} = (0, 46, 1, 1)$ lies on line ℓ_4

$297 : P_{11265} = (0, 47, 1, 1)$ lies on line ℓ_4

$298 : P_{11329} = (0, 48, 1, 1)$ lies on line ℓ_4

$299 : P_{11393} = (0, 49, 1, 1)$ lies on line ℓ_4

$300 : P_{11457} = (0, 50, 1, 1)$ lies on line ℓ_4

$301 : P_{11521} = (0, 51, 1, 1)$ lies on line ℓ_4

$302 : P_{11585} = (0, 52, 1, 1)$ lies on line ℓ_4

$303 : P_{11649} = (0, 53, 1, 1)$ lies on line ℓ_4

$304 : P_{11713} = (0, 54, 1, 1)$ lies on line ℓ_4

$305 : P_{11777} = (0, 55, 1, 1)$ lies on line ℓ_4

$306 : P_{11841} = (0, 56, 1, 1)$ lies on line ℓ_4

$307 : P_{11905} = (0, 57, 1, 1)$ lies on line ℓ_4

$308 : P_{11969} = (0, 58, 1, 1)$ lies on line ℓ_4

$309 : P_{12033} = (0, 59, 1, 1)$ lies on line ℓ_4

$310 : P_{12097} = (0, 60, 1, 1)$ lies on line ℓ_4

$311 : P_{12161} = (0, 61, 1, 1)$ lies on line ℓ_4

$312 : P_{12225} = (0, 62, 1, 1)$ lies on line ℓ_4

$313 : P_{12289} = (0, 63, 1, 1)$ lies on line ℓ_4

$314 : P_{12353} = (0, 0, 2, 1)$ lies on line ℓ_5

$315 : P_{12418} = (1, 1, 2, 1)$ lies on line ℓ_6

$316 : P_{16449} = (0, 0, 3, 1)$ lies on line ℓ_5

$317 : P_{16514} = (1, 1, 3, 1)$ lies on line ℓ_6

$318 : P_{20545} = (0, 0, 4, 1)$ lies on line ℓ_5

$319 : P_{20610} = (1, 1, 4, 1)$ lies on line ℓ_6

$320 : P_{24641} = (0, 0, 5, 1)$ lies on line ℓ_5

$321 : P_{24706} = (1, 1, 5, 1)$ lies on line ℓ_6

$322 : P_{28737} = (0, 0, 6, 1)$ lies on line ℓ_5

$323 : P_{28802} = (1, 1, 6, 1)$ lies on line ℓ_6

$324 : P_{32833} = (0, 0, 7, 1)$ lies on line ℓ_5

$325 : P_{32898} = (1, 1, 7, 1)$ lies on line ℓ_6

$326 : P_{36929} = (0, 0, 8, 1)$ lies on line ℓ_5

$327 : P_{36994} = (1, 1, 8, 1)$ lies on line ℓ_6

$328 : P_{41025} = (0, 0, 9, 1)$ lies on line ℓ_5

$329 : P_{41090} = (1, 1, 9, 1)$ lies on line ℓ_6

$330 : P_{45121} = (0, 0, 10, 1)$ lies on line ℓ_5

$331 : P_{45186} = (1, 1, 10, 1)$ lies on line ℓ_6

$332 : P_{49217} = (0, 0, 11, 1)$ lies on line ℓ_5

$333 : P_{49282} = (1, 1, 11, 1)$ lies on line ℓ_6

$334 : P_{53313} = (0, 0, 12, 1)$ lies on line ℓ_5

$335 : P_{53378} = (1, 1, 12, 1)$ lies on line ℓ_6

$336 : P_{57409} = (0, 0, 13, 1)$ lies on line ℓ_5

$337 : P_{57474} = (1, 1, 13, 1)$ lies on line ℓ_6

$338 : P_{61505} = (0, 0, 14, 1)$ lies on line ℓ_5

$339 : P_{61570} = (1, 1, 14, 1)$ lies on line ℓ_6

$340 : P_{65601} = (0, 0, 15, 1)$ lies on line ℓ_5

$341 : P_{65666} = (1, 1, 15, 1)$ lies on line ℓ_6

$342 : P_{69697} = (0, 0, 16, 1)$ lies on line ℓ_5

$343 : P_{69762} = (1, 1, 16, 1)$ lies on line ℓ_6

$344 : P_{73793} = (0, 0, 17, 1)$ lies on line ℓ_5

$345 : P_{73858} = (1, 1, 17, 1)$ lies on line ℓ_6

$346 : P_{77889} = (0, 0, 18, 1)$ lies on line ℓ_5

$347 : P_{77954} = (1, 1, 18, 1)$ lies on line ℓ_6

$348 : P_{81985} = (0, 0, 19, 1)$ lies on line ℓ_5

$349 : P_{82050} = (1, 1, 19, 1)$ lies on line ℓ_6

350 : $P_{86081} = (0, 0, 20, 1)$ lies on line ℓ_5
351 : $P_{86146} = (1, 1, 20, 1)$ lies on line ℓ_6
352 : $P_{90177} = (0, 0, 21, 1)$ lies on line ℓ_5
353 : $P_{90242} = (1, 1, 21, 1)$ lies on line ℓ_6
354 : $P_{94273} = (0, 0, 22, 1)$ lies on line ℓ_5
355 : $P_{94338} = (1, 1, 22, 1)$ lies on line ℓ_6
356 : $P_{98369} = (0, 0, 23, 1)$ lies on line ℓ_5
357 : $P_{98434} = (1, 1, 23, 1)$ lies on line ℓ_6
358 : $P_{102465} = (0, 0, 24, 1)$ lies on line ℓ_5
359 : $P_{102530} = (1, 1, 24, 1)$ lies on line ℓ_6
360 : $P_{106561} = (0, 0, 25, 1)$ lies on line ℓ_5
361 : $P_{106626} = (1, 1, 25, 1)$ lies on line ℓ_6
362 : $P_{110657} = (0, 0, 26, 1)$ lies on line ℓ_5
363 : $P_{110722} = (1, 1, 26, 1)$ lies on line ℓ_6
364 : $P_{114753} = (0, 0, 27, 1)$ lies on line ℓ_5
365 : $P_{114818} = (1, 1, 27, 1)$ lies on line ℓ_6
366 : $P_{118849} = (0, 0, 28, 1)$ lies on line ℓ_5
367 : $P_{118914} = (1, 1, 28, 1)$ lies on line ℓ_6
368 : $P_{122945} = (0, 0, 29, 1)$ lies on line ℓ_5
369 : $P_{123010} = (1, 1, 29, 1)$ lies on line ℓ_6
370 : $P_{127041} = (0, 0, 30, 1)$ lies on line ℓ_5
371 : $P_{127106} = (1, 1, 30, 1)$ lies on line ℓ_6
372 : $P_{131137} = (0, 0, 31, 1)$ lies on line ℓ_5
373 : $P_{131202} = (1, 1, 31, 1)$ lies on line ℓ_6
374 : $P_{135233} = (0, 0, 32, 1)$ lies on line ℓ_5
375 : $P_{135298} = (1, 1, 32, 1)$ lies on line ℓ_6
376 : $P_{139329} = (0, 0, 33, 1)$ lies on line ℓ_5
377 : $P_{139394} = (1, 1, 33, 1)$ lies on line ℓ_6
378 : $P_{143425} = (0, 0, 34, 1)$ lies on line ℓ_5
379 : $P_{143490} = (1, 1, 34, 1)$ lies on line ℓ_6
380 : $P_{147521} = (0, 0, 35, 1)$ lies on line ℓ_5
381 : $P_{147586} = (1, 1, 35, 1)$ lies on line ℓ_6
382 : $P_{151617} = (0, 0, 36, 1)$ lies on line ℓ_5
383 : $P_{151682} = (1, 1, 36, 1)$ lies on line ℓ_6
384 : $P_{155713} = (0, 0, 37, 1)$ lies on line ℓ_5
385 : $P_{155778} = (1, 1, 37, 1)$ lies on line ℓ_6
386 : $P_{159809} = (0, 0, 38, 1)$ lies on line ℓ_5
387 : $P_{159874} = (1, 1, 38, 1)$ lies on line ℓ_6
388 : $P_{163905} = (0, 0, 39, 1)$ lies on line ℓ_5
389 : $P_{163970} = (1, 1, 39, 1)$ lies on line ℓ_6
390 : $P_{168001} = (0, 0, 40, 1)$ lies on line ℓ_5
391 : $P_{168066} = (1, 1, 40, 1)$ lies on line ℓ_6
392 : $P_{172097} = (0, 0, 41, 1)$ lies on line ℓ_5
393 : $P_{172162} = (1, 1, 41, 1)$ lies on line ℓ_6
394 : $P_{176193} = (0, 0, 42, 1)$ lies on line ℓ_5

395 : $P_{176258} = (1, 1, 42, 1)$ lies on line ℓ_6
396 : $P_{180289} = (0, 0, 43, 1)$ lies on line ℓ_5
397 : $P_{180354} = (1, 1, 43, 1)$ lies on line ℓ_6
398 : $P_{184385} = (0, 0, 44, 1)$ lies on line ℓ_5
399 : $P_{184450} = (1, 1, 44, 1)$ lies on line ℓ_6
400 : $P_{188481} = (0, 0, 45, 1)$ lies on line ℓ_5
401 : $P_{188546} = (1, 1, 45, 1)$ lies on line ℓ_6
402 : $P_{192577} = (0, 0, 46, 1)$ lies on line ℓ_5
403 : $P_{192642} = (1, 1, 46, 1)$ lies on line ℓ_6
404 : $P_{196673} = (0, 0, 47, 1)$ lies on line ℓ_5
405 : $P_{196738} = (1, 1, 47, 1)$ lies on line ℓ_6
406 : $P_{200769} = (0, 0, 48, 1)$ lies on line ℓ_5
407 : $P_{200834} = (1, 1, 48, 1)$ lies on line ℓ_6
408 : $P_{204865} = (0, 0, 49, 1)$ lies on line ℓ_5
409 : $P_{204930} = (1, 1, 49, 1)$ lies on line ℓ_6
410 : $P_{208961} = (0, 0, 50, 1)$ lies on line ℓ_5
411 : $P_{209026} = (1, 1, 50, 1)$ lies on line ℓ_6
412 : $P_{213057} = (0, 0, 51, 1)$ lies on line ℓ_5
413 : $P_{213122} = (1, 1, 51, 1)$ lies on line ℓ_6
414 : $P_{217153} = (0, 0, 52, 1)$ lies on line ℓ_5
415 : $P_{217218} = (1, 1, 52, 1)$ lies on line ℓ_6
416 : $P_{221249} = (0, 0, 53, 1)$ lies on line ℓ_5
417 : $P_{221314} = (1, 1, 53, 1)$ lies on line ℓ_6
418 : $P_{225345} = (0, 0, 54, 1)$ lies on line ℓ_5
419 : $P_{225410} = (1, 1, 54, 1)$ lies on line ℓ_6
420 : $P_{229441} = (0, 0, 55, 1)$ lies on line ℓ_5
421 : $P_{229506} = (1, 1, 55, 1)$ lies on line ℓ_6
422 : $P_{233537} = (0, 0, 56, 1)$ lies on line ℓ_5
423 : $P_{233602} = (1, 1, 56, 1)$ lies on line ℓ_6
424 : $P_{237633} = (0, 0, 57, 1)$ lies on line ℓ_5
425 : $P_{237698} = (1, 1, 57, 1)$ lies on line ℓ_6
426 : $P_{241729} = (0, 0, 58, 1)$ lies on line ℓ_5
427 : $P_{241794} = (1, 1, 58, 1)$ lies on line ℓ_6
428 : $P_{245825} = (0, 0, 59, 1)$ lies on line ℓ_5
429 : $P_{245890} = (1, 1, 59, 1)$ lies on line ℓ_6
430 : $P_{249921} = (0, 0, 60, 1)$ lies on line ℓ_5
431 : $P_{249986} = (1, 1, 60, 1)$ lies on line ℓ_6
432 : $P_{254017} = (0, 0, 61, 1)$ lies on line ℓ_5
433 : $P_{254082} = (1, 1, 61, 1)$ lies on line ℓ_6
434 : $P_{258113} = (0, 0, 62, 1)$ lies on line ℓ_5
435 : $P_{258178} = (1, 1, 62, 1)$ lies on line ℓ_6
436 : $P_{262209} = (0, 0, 63, 1)$ lies on line ℓ_5
437 : $P_{262274} = (1, 1, 63, 1)$ lies on line ℓ_6

The single points on the surface are:

Points on surface but on no line

The surface has 3844 points not on any line:
Too many to print.

Line Intersection Graph

```
  |0 1 2 3 4 5 6
0 |0 1 1 1 1 0 0
1 |1 0 1 1 0 1 1
2 |1 1 0 0 0 1 1
3 |1 1 0 0 1 0 1
4 |1 0 0 1 0 1 0
5 |0 1 1 0 1 0 1
6 |0 1 1 1 0 1 0
```

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_4
in point	P_0	P_5	P_0	P_1

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_5	ℓ_6
in point	P_0	P_2	P_0	P_2	P_2

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_5	ℓ_6
in point	P_5	P_2	P_2	P_2

Line 3 intersects

Line	ℓ_0	ℓ_1	ℓ_4	ℓ_6
in point	P_0	P_0	P_{8322}	P_4

Line 4 intersects

Line	ℓ_0	ℓ_3	ℓ_5
in point	P_1	P_{8322}	P_{8258}

Line 5 intersects

Line	ℓ_1	ℓ_2	ℓ_4	ℓ_6
in point	P_2	P_2	P_{8258}	P_2

Line 6 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_5
in point	P_2	P_2	P_4	P_2

The surface has 4289 points:
Too many to print.