

Rank-264 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0)

The point rank of the equation over GF(64) is -2113396658

General information

Number of lines	7
Number of points	4289
Number of singular points	0
Number of Eckardt points	3
Number of double points	0
Number of single points	446
Number of points off lines	3840
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^7
Type of lines on points	$3^3, 1^{446}, 0^{3840}$

Singular Points

The surface has 0 singular points:

The 7 Lines

The lines and their Pluecker coordinates are:

$$\begin{aligned}\ell_0 &= \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array} \right]_{4097} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array} \right]_{4097} = \mathbf{Pl}(0, 0, 1, 0, 1, 0)_{4352} \\ \ell_1 &= \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array} \right]_{17043457} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array} \right]_{17043457} = \mathbf{Pl}(0, 0, 0, 1, 0, 1)_{278529}\end{aligned}$$

$$\begin{aligned}
\ell_2 &= \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{21} \end{bmatrix}_{17043513} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 57 \end{bmatrix}_{17043513} = \mathbf{Pl}(0, 0, 0, 57, 0, 1)_{285641} \\
\ell_3 &= \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{42} \end{bmatrix}_{17043512} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 56 \end{bmatrix}_{17043512} = \mathbf{Pl}(0, 0, 0, 56, 0, 1)_{285514} \\
\ell_4 &= \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{8258} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{8258} = \mathbf{Pl}(0, 0, 1, 1, 1, 1)_{544578} \\
\ell_5 &= \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{4226} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{4226} = \mathbf{Pl}(1, 1, 1, 0, 1, 1)_{536640} \\
\ell_6 &= \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{266369} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{266369} = \mathbf{Pl}(1, 1, 1, 1, 1, 0)_{20354}
\end{aligned}$$

Rank of lines: (4097, 17043457, 17043513, 17043512, 8258, 4226, 266369)

Rank of points on Klein quadric: (4352, 278529, 285641, 285514, 544578, 536640, 20354)

Eckardt Points

The surface has 3 Eckardt points:

- 0 : $P_1 = \mathbf{P}(0, 1, 0, 0) = \mathbf{P}(0, 1, 0, 0)$,
- 1 : $P_{8258} = \mathbf{P}(0, 0, 1, 1) = \mathbf{P}(0, 0, 1, 1)$,
- 2 : $P_{8322} = \mathbf{P}(0, 1, 1, 1) = \mathbf{P}(0, 1, 1, 1)$.

Double Points

The surface has 0 Double points:

The double points on the surface are:

Single Points

The surface has 446 single points:

The single points on the surface are:

- | | |
|---|---|
| 0 : $P_0 = (1, 0, 0, 0)$ lies on line ℓ_0 | 17 : $P_{8269} = (11, 0, 1, 1)$ lies on line ℓ_0 |
| 1 : $P_4 = (1, 1, 1, 1)$ lies on line ℓ_4 | 18 : $P_{8270} = (12, 0, 1, 1)$ lies on line ℓ_0 |
| 2 : $P_5 = (1, 1, 0, 0)$ lies on line ℓ_4 | 19 : $P_{8271} = (13, 0, 1, 1)$ lies on line ℓ_0 |
| 3 : $P_{68} = (1, 0, 1, 0)$ lies on line ℓ_5 | 20 : $P_{8272} = (14, 0, 1, 1)$ lies on line ℓ_0 |
| 4 : $P_{132} = (1, 1, 1, 0)$ lies on line ℓ_6 | 21 : $P_{8273} = (15, 0, 1, 1)$ lies on line ℓ_0 |
| 5 : $P_{4163} = (1, 0, 0, 1)$ lies on line ℓ_6 | 22 : $P_{8274} = (16, 0, 1, 1)$ lies on line ℓ_0 |
| 6 : $P_{4227} = (1, 1, 0, 1)$ lies on line ℓ_5 | 23 : $P_{8275} = (17, 0, 1, 1)$ lies on line ℓ_0 |
| 7 : $P_{8259} = (1, 0, 1, 1)$ lies on line ℓ_0 | 24 : $P_{8276} = (18, 0, 1, 1)$ lies on line ℓ_0 |
| 8 : $P_{8260} = (2, 0, 1, 1)$ lies on line ℓ_0 | 25 : $P_{8277} = (19, 0, 1, 1)$ lies on line ℓ_0 |
| 9 : $P_{8261} = (3, 0, 1, 1)$ lies on line ℓ_0 | 26 : $P_{8278} = (20, 0, 1, 1)$ lies on line ℓ_0 |
| 10 : $P_{8262} = (4, 0, 1, 1)$ lies on line ℓ_0 | 27 : $P_{8279} = (21, 0, 1, 1)$ lies on line ℓ_0 |
| 11 : $P_{8263} = (5, 0, 1, 1)$ lies on line ℓ_0 | 28 : $P_{8280} = (22, 0, 1, 1)$ lies on line ℓ_0 |
| 12 : $P_{8264} = (6, 0, 1, 1)$ lies on line ℓ_0 | 29 : $P_{8281} = (23, 0, 1, 1)$ lies on line ℓ_0 |
| 13 : $P_{8265} = (7, 0, 1, 1)$ lies on line ℓ_0 | 30 : $P_{8282} = (24, 0, 1, 1)$ lies on line ℓ_0 |
| 14 : $P_{8266} = (8, 0, 1, 1)$ lies on line ℓ_0 | 31 : $P_{8283} = (25, 0, 1, 1)$ lies on line ℓ_0 |
| 15 : $P_{8267} = (9, 0, 1, 1)$ lies on line ℓ_0 | 32 : $P_{8284} = (26, 0, 1, 1)$ lies on line ℓ_0 |
| 16 : $P_{8268} = (10, 0, 1, 1)$ lies on line ℓ_0 | 33 : $P_{8285} = (27, 0, 1, 1)$ lies on line ℓ_0 |

34 : $P_{8286} = (28, 0, 1, 1)$ lies on line ℓ_0
 35 : $P_{8287} = (29, 0, 1, 1)$ lies on line ℓ_0
 36 : $P_{8288} = (30, 0, 1, 1)$ lies on line ℓ_0
 37 : $P_{8289} = (31, 0, 1, 1)$ lies on line ℓ_0
 38 : $P_{8290} = (32, 0, 1, 1)$ lies on line ℓ_0
 39 : $P_{8291} = (33, 0, 1, 1)$ lies on line ℓ_0
 40 : $P_{8292} = (34, 0, 1, 1)$ lies on line ℓ_0
 41 : $P_{8293} = (35, 0, 1, 1)$ lies on line ℓ_0
 42 : $P_{8294} = (36, 0, 1, 1)$ lies on line ℓ_0
 43 : $P_{8295} = (37, 0, 1, 1)$ lies on line ℓ_0
 44 : $P_{8296} = (38, 0, 1, 1)$ lies on line ℓ_0
 45 : $P_{8297} = (39, 0, 1, 1)$ lies on line ℓ_0
 46 : $P_{8298} = (40, 0, 1, 1)$ lies on line ℓ_0
 47 : $P_{8299} = (41, 0, 1, 1)$ lies on line ℓ_0
 48 : $P_{8300} = (42, 0, 1, 1)$ lies on line ℓ_0
 49 : $P_{8301} = (43, 0, 1, 1)$ lies on line ℓ_0
 50 : $P_{8302} = (44, 0, 1, 1)$ lies on line ℓ_0
 51 : $P_{8303} = (45, 0, 1, 1)$ lies on line ℓ_0
 52 : $P_{8304} = (46, 0, 1, 1)$ lies on line ℓ_0
 53 : $P_{8305} = (47, 0, 1, 1)$ lies on line ℓ_0
 54 : $P_{8306} = (48, 0, 1, 1)$ lies on line ℓ_0
 55 : $P_{8307} = (49, 0, 1, 1)$ lies on line ℓ_0
 56 : $P_{8308} = (50, 0, 1, 1)$ lies on line ℓ_0
 57 : $P_{8309} = (51, 0, 1, 1)$ lies on line ℓ_0
 58 : $P_{8310} = (52, 0, 1, 1)$ lies on line ℓ_0
 59 : $P_{8311} = (53, 0, 1, 1)$ lies on line ℓ_0
 60 : $P_{8312} = (54, 0, 1, 1)$ lies on line ℓ_0
 61 : $P_{8313} = (55, 0, 1, 1)$ lies on line ℓ_0
 62 : $P_{8314} = (56, 0, 1, 1)$ lies on line ℓ_0
 63 : $P_{8315} = (57, 0, 1, 1)$ lies on line ℓ_0
 64 : $P_{8316} = (58, 0, 1, 1)$ lies on line ℓ_0
 65 : $P_{8317} = (59, 0, 1, 1)$ lies on line ℓ_0
 66 : $P_{8318} = (60, 0, 1, 1)$ lies on line ℓ_0
 67 : $P_{8319} = (61, 0, 1, 1)$ lies on line ℓ_0
 68 : $P_{8320} = (62, 0, 1, 1)$ lies on line ℓ_0
 69 : $P_{8321} = (63, 0, 1, 1)$ lies on line ℓ_0
 70 : $P_{8385} = (0, 2, 1, 1)$ lies on line ℓ_1
 71 : $P_{8387} = (2, 2, 1, 1)$ lies on line ℓ_4
 72 : $P_{8449} = (0, 3, 1, 1)$ lies on line ℓ_1
 73 : $P_{8452} = (3, 3, 1, 1)$ lies on line ℓ_4
 74 : $P_{8513} = (0, 4, 1, 1)$ lies on line ℓ_1
 75 : $P_{8517} = (4, 4, 1, 1)$ lies on line ℓ_4
 76 : $P_{8577} = (0, 5, 1, 1)$ lies on line ℓ_1
 77 : $P_{8582} = (5, 5, 1, 1)$ lies on line ℓ_4
 78 : $P_{8641} = (0, 6, 1, 1)$ lies on line ℓ_1
 79 : $P_{8647} = (6, 6, 1, 1)$ lies on line ℓ_4
 80 : $P_{8705} = (0, 7, 1, 1)$ lies on line ℓ_1
 81 : $P_{8712} = (7, 7, 1, 1)$ lies on line ℓ_4
 82 : $P_{8769} = (0, 8, 1, 1)$ lies on line ℓ_1
 83 : $P_{8777} = (8, 8, 1, 1)$ lies on line ℓ_4
 84 : $P_{8833} = (0, 9, 1, 1)$ lies on line ℓ_1
 85 : $P_{8842} = (9, 9, 1, 1)$ lies on line ℓ_4
 86 : $P_{8897} = (0, 10, 1, 1)$ lies on line ℓ_1
 87 : $P_{8907} = (10, 10, 1, 1)$ lies on line ℓ_4

88 : $P_{8961} = (0, 11, 1, 1)$ lies on line ℓ_1
 89 : $P_{8972} = (11, 11, 1, 1)$ lies on line ℓ_4
 90 : $P_{9025} = (0, 12, 1, 1)$ lies on line ℓ_1
 91 : $P_{9037} = (12, 12, 1, 1)$ lies on line ℓ_4
 92 : $P_{9089} = (0, 13, 1, 1)$ lies on line ℓ_1
 93 : $P_{9102} = (13, 13, 1, 1)$ lies on line ℓ_4
 94 : $P_{9153} = (0, 14, 1, 1)$ lies on line ℓ_1
 95 : $P_{9167} = (14, 14, 1, 1)$ lies on line ℓ_4
 96 : $P_{9217} = (0, 15, 1, 1)$ lies on line ℓ_1
 97 : $P_{9232} = (15, 15, 1, 1)$ lies on line ℓ_4
 98 : $P_{9281} = (0, 16, 1, 1)$ lies on line ℓ_1
 99 : $P_{9297} = (16, 16, 1, 1)$ lies on line ℓ_4
 100 : $P_{9345} = (0, 17, 1, 1)$ lies on line ℓ_1
 101 : $P_{9362} = (17, 17, 1, 1)$ lies on line ℓ_4
 102 : $P_{9409} = (0, 18, 1, 1)$ lies on line ℓ_1
 103 : $P_{9427} = (18, 18, 1, 1)$ lies on line ℓ_4
 104 : $P_{9473} = (0, 19, 1, 1)$ lies on line ℓ_1
 105 : $P_{9492} = (19, 19, 1, 1)$ lies on line ℓ_4
 106 : $P_{9537} = (0, 20, 1, 1)$ lies on line ℓ_1
 107 : $P_{9557} = (20, 20, 1, 1)$ lies on line ℓ_4
 108 : $P_{9601} = (0, 21, 1, 1)$ lies on line ℓ_1
 109 : $P_{9622} = (21, 21, 1, 1)$ lies on line ℓ_4
 110 : $P_{9665} = (0, 22, 1, 1)$ lies on line ℓ_1
 111 : $P_{9687} = (22, 22, 1, 1)$ lies on line ℓ_4
 112 : $P_{9729} = (0, 23, 1, 1)$ lies on line ℓ_1
 113 : $P_{9752} = (23, 23, 1, 1)$ lies on line ℓ_4
 114 : $P_{9793} = (0, 24, 1, 1)$ lies on line ℓ_1
 115 : $P_{9817} = (24, 24, 1, 1)$ lies on line ℓ_4
 116 : $P_{9857} = (0, 25, 1, 1)$ lies on line ℓ_1
 117 : $P_{9882} = (25, 25, 1, 1)$ lies on line ℓ_4
 118 : $P_{9921} = (0, 26, 1, 1)$ lies on line ℓ_1
 119 : $P_{9947} = (26, 26, 1, 1)$ lies on line ℓ_4
 120 : $P_{9985} = (0, 27, 1, 1)$ lies on line ℓ_1
 121 : $P_{10012} = (27, 27, 1, 1)$ lies on line ℓ_4
 122 : $P_{10049} = (0, 28, 1, 1)$ lies on line ℓ_1
 123 : $P_{10077} = (28, 28, 1, 1)$ lies on line ℓ_4
 124 : $P_{10113} = (0, 29, 1, 1)$ lies on line ℓ_1
 125 : $P_{10142} = (29, 29, 1, 1)$ lies on line ℓ_4
 126 : $P_{10177} = (0, 30, 1, 1)$ lies on line ℓ_1
 127 : $P_{10207} = (30, 30, 1, 1)$ lies on line ℓ_4
 128 : $P_{10241} = (0, 31, 1, 1)$ lies on line ℓ_1
 129 : $P_{10272} = (31, 31, 1, 1)$ lies on line ℓ_4
 130 : $P_{10305} = (0, 32, 1, 1)$ lies on line ℓ_1
 131 : $P_{10337} = (32, 32, 1, 1)$ lies on line ℓ_4
 132 : $P_{10369} = (0, 33, 1, 1)$ lies on line ℓ_1
 133 : $P_{10402} = (33, 33, 1, 1)$ lies on line ℓ_4
 134 : $P_{10433} = (0, 34, 1, 1)$ lies on line ℓ_1
 135 : $P_{10467} = (34, 34, 1, 1)$ lies on line ℓ_4
 136 : $P_{10497} = (0, 35, 1, 1)$ lies on line ℓ_1
 137 : $P_{10532} = (35, 35, 1, 1)$ lies on line ℓ_4
 138 : $P_{10561} = (0, 36, 1, 1)$ lies on line ℓ_1
 139 : $P_{10597} = (36, 36, 1, 1)$ lies on line ℓ_4
 140 : $P_{10625} = (0, 37, 1, 1)$ lies on line ℓ_1
 141 : $P_{10662} = (37, 37, 1, 1)$ lies on line ℓ_4

142 : $P_{10689} = (0, 38, 1, 1)$ lies on line ℓ_1
143 : $P_{10727} = (38, 38, 1, 1)$ lies on line ℓ_4
144 : $P_{10753} = (0, 39, 1, 1)$ lies on line ℓ_1
145 : $P_{10792} = (39, 39, 1, 1)$ lies on line ℓ_4
146 : $P_{10817} = (0, 40, 1, 1)$ lies on line ℓ_1
147 : $P_{10857} = (40, 40, 1, 1)$ lies on line ℓ_4
148 : $P_{10881} = (0, 41, 1, 1)$ lies on line ℓ_1
149 : $P_{10922} = (41, 41, 1, 1)$ lies on line ℓ_4
150 : $P_{10945} = (0, 42, 1, 1)$ lies on line ℓ_1
151 : $P_{10987} = (42, 42, 1, 1)$ lies on line ℓ_4
152 : $P_{11009} = (0, 43, 1, 1)$ lies on line ℓ_1
153 : $P_{11052} = (43, 43, 1, 1)$ lies on line ℓ_4
154 : $P_{11073} = (0, 44, 1, 1)$ lies on line ℓ_1
155 : $P_{11117} = (44, 44, 1, 1)$ lies on line ℓ_4
156 : $P_{11137} = (0, 45, 1, 1)$ lies on line ℓ_1
157 : $P_{11182} = (45, 45, 1, 1)$ lies on line ℓ_4
158 : $P_{11201} = (0, 46, 1, 1)$ lies on line ℓ_1
159 : $P_{11247} = (46, 46, 1, 1)$ lies on line ℓ_4
160 : $P_{11265} = (0, 47, 1, 1)$ lies on line ℓ_1
161 : $P_{11312} = (47, 47, 1, 1)$ lies on line ℓ_4
162 : $P_{11329} = (0, 48, 1, 1)$ lies on line ℓ_1
163 : $P_{11377} = (48, 48, 1, 1)$ lies on line ℓ_4
164 : $P_{11393} = (0, 49, 1, 1)$ lies on line ℓ_1
165 : $P_{11442} = (49, 49, 1, 1)$ lies on line ℓ_4
166 : $P_{11457} = (0, 50, 1, 1)$ lies on line ℓ_1
167 : $P_{11507} = (50, 50, 1, 1)$ lies on line ℓ_4
168 : $P_{11521} = (0, 51, 1, 1)$ lies on line ℓ_1
169 : $P_{11572} = (51, 51, 1, 1)$ lies on line ℓ_4
170 : $P_{11585} = (0, 52, 1, 1)$ lies on line ℓ_1
171 : $P_{11637} = (52, 52, 1, 1)$ lies on line ℓ_4
172 : $P_{11649} = (0, 53, 1, 1)$ lies on line ℓ_1
173 : $P_{11702} = (53, 53, 1, 1)$ lies on line ℓ_4
174 : $P_{11713} = (0, 54, 1, 1)$ lies on line ℓ_1
175 : $P_{11767} = (54, 54, 1, 1)$ lies on line ℓ_4
176 : $P_{11777} = (0, 55, 1, 1)$ lies on line ℓ_1
177 : $P_{11832} = (55, 55, 1, 1)$ lies on line ℓ_4
178 : $P_{11841} = (0, 56, 1, 1)$ lies on line ℓ_1
179 : $P_{11897} = (56, 56, 1, 1)$ lies on line ℓ_4
180 : $P_{11905} = (0, 57, 1, 1)$ lies on line ℓ_1
181 : $P_{11962} = (57, 57, 1, 1)$ lies on line ℓ_4
182 : $P_{11969} = (0, 58, 1, 1)$ lies on line ℓ_1
183 : $P_{12027} = (58, 58, 1, 1)$ lies on line ℓ_4
184 : $P_{12033} = (0, 59, 1, 1)$ lies on line ℓ_1
185 : $P_{12092} = (59, 59, 1, 1)$ lies on line ℓ_4
186 : $P_{12097} = (0, 60, 1, 1)$ lies on line ℓ_1
187 : $P_{12157} = (60, 60, 1, 1)$ lies on line ℓ_4
188 : $P_{12161} = (0, 61, 1, 1)$ lies on line ℓ_1
189 : $P_{12222} = (61, 61, 1, 1)$ lies on line ℓ_4
190 : $P_{12225} = (0, 62, 1, 1)$ lies on line ℓ_1
191 : $P_{12287} = (62, 62, 1, 1)$ lies on line ℓ_4
192 : $P_{12289} = (0, 63, 1, 1)$ lies on line ℓ_1
193 : $P_{12352} = (63, 63, 1, 1)$ lies on line ℓ_4
194 : $P_{12420} = (3, 1, 2, 1)$ lies on line ℓ_5
195 : $P_{12484} = (3, 2, 2, 1)$ lies on line ℓ_6
196 : $P_{16515} = (2, 1, 3, 1)$ lies on line ℓ_5
197 : $P_{16643} = (2, 3, 3, 1)$ lies on line ℓ_6
198 : $P_{20614} = (5, 1, 4, 1)$ lies on line ℓ_5
199 : $P_{20806} = (5, 4, 4, 1)$ lies on line ℓ_6
200 : $P_{24709} = (4, 1, 5, 1)$ lies on line ℓ_5
201 : $P_{24965} = (4, 5, 5, 1)$ lies on line ℓ_6
202 : $P_{28808} = (7, 1, 6, 1)$ lies on line ℓ_5
203 : $P_{29128} = (7, 6, 6, 1)$ lies on line ℓ_6
204 : $P_{32903} = (6, 1, 7, 1)$ lies on line ℓ_5
205 : $P_{33287} = (6, 7, 7, 1)$ lies on line ℓ_6
206 : $P_{37002} = (9, 1, 8, 1)$ lies on line ℓ_5
207 : $P_{37450} = (9, 8, 8, 1)$ lies on line ℓ_6
208 : $P_{41097} = (8, 1, 9, 1)$ lies on line ℓ_5
209 : $P_{41609} = (8, 9, 9, 1)$ lies on line ℓ_6
210 : $P_{45196} = (11, 1, 10, 1)$ lies on line ℓ_5
211 : $P_{45772} = (11, 10, 10, 1)$ lies on line ℓ_6
212 : $P_{49291} = (10, 1, 11, 1)$ lies on line ℓ_5
213 : $P_{49931} = (10, 11, 11, 1)$ lies on line ℓ_6
214 : $P_{53390} = (13, 1, 12, 1)$ lies on line ℓ_5
215 : $P_{54094} = (13, 12, 12, 1)$ lies on line ℓ_6
216 : $P_{57485} = (12, 1, 13, 1)$ lies on line ℓ_5
217 : $P_{58253} = (12, 13, 13, 1)$ lies on line ℓ_6
218 : $P_{61584} = (15, 1, 14, 1)$ lies on line ℓ_5
219 : $P_{62416} = (15, 14, 14, 1)$ lies on line ℓ_6
220 : $P_{65679} = (14, 1, 15, 1)$ lies on line ℓ_5
221 : $P_{66575} = (14, 15, 15, 1)$ lies on line ℓ_6
222 : $P_{69778} = (17, 1, 16, 1)$ lies on line ℓ_5
223 : $P_{70738} = (17, 16, 16, 1)$ lies on line ℓ_6
224 : $P_{73873} = (16, 1, 17, 1)$ lies on line ℓ_5
225 : $P_{74897} = (16, 17, 17, 1)$ lies on line ℓ_6
226 : $P_{77972} = (19, 1, 18, 1)$ lies on line ℓ_5
227 : $P_{79060} = (19, 18, 18, 1)$ lies on line ℓ_6
228 : $P_{82067} = (18, 1, 19, 1)$ lies on line ℓ_5
229 : $P_{83219} = (18, 19, 19, 1)$ lies on line ℓ_6
230 : $P_{86166} = (21, 1, 20, 1)$ lies on line ℓ_5
231 : $P_{87382} = (21, 20, 20, 1)$ lies on line ℓ_6
232 : $P_{90261} = (20, 1, 21, 1)$ lies on line ℓ_5
233 : $P_{91541} = (20, 21, 21, 1)$ lies on line ℓ_6
234 : $P_{94360} = (23, 1, 22, 1)$ lies on line ℓ_5
235 : $P_{95704} = (23, 22, 22, 1)$ lies on line ℓ_6
236 : $P_{98455} = (22, 1, 23, 1)$ lies on line ℓ_5
237 : $P_{99863} = (22, 23, 23, 1)$ lies on line ℓ_6
238 : $P_{102554} = (25, 1, 24, 1)$ lies on line ℓ_5
239 : $P_{104026} = (25, 24, 24, 1)$ lies on line ℓ_6
240 : $P_{106649} = (24, 1, 25, 1)$ lies on line ℓ_5
241 : $P_{108185} = (24, 25, 25, 1)$ lies on line ℓ_6
242 : $P_{110748} = (27, 1, 26, 1)$ lies on line ℓ_5
243 : $P_{112348} = (27, 26, 26, 1)$ lies on line ℓ_6
244 : $P_{114843} = (26, 1, 27, 1)$ lies on line ℓ_5
245 : $P_{116507} = (26, 27, 27, 1)$ lies on line ℓ_6
246 : $P_{118942} = (29, 1, 28, 1)$ lies on line ℓ_5
247 : $P_{120670} = (29, 28, 28, 1)$ lies on line ℓ_6
248 : $P_{123037} = (28, 1, 29, 1)$ lies on line ℓ_5
249 : $P_{124829} = (28, 29, 29, 1)$ lies on line ℓ_6

250 : $P_{127136} = (31, 1, 30, 1)$ lies on line ℓ_5
 251 : $P_{128992} = (31, 30, 30, 1)$ lies on line ℓ_6
 252 : $P_{131231} = (30, 1, 31, 1)$ lies on line ℓ_5
 253 : $P_{133151} = (30, 31, 31, 1)$ lies on line ℓ_6
 254 : $P_{135330} = (33, 1, 32, 1)$ lies on line ℓ_5
 255 : $P_{137314} = (33, 32, 32, 1)$ lies on line ℓ_6
 256 : $P_{139425} = (32, 1, 33, 1)$ lies on line ℓ_5
 257 : $P_{141473} = (32, 33, 33, 1)$ lies on line ℓ_6
 258 : $P_{143524} = (35, 1, 34, 1)$ lies on line ℓ_5
 259 : $P_{145636} = (35, 34, 34, 1)$ lies on line ℓ_6
 260 : $P_{147619} = (34, 1, 35, 1)$ lies on line ℓ_5
 261 : $P_{149795} = (34, 35, 35, 1)$ lies on line ℓ_6
 262 : $P_{151718} = (37, 1, 36, 1)$ lies on line ℓ_5
 263 : $P_{153958} = (37, 36, 36, 1)$ lies on line ℓ_6
 264 : $P_{155813} = (36, 1, 37, 1)$ lies on line ℓ_5
 265 : $P_{158117} = (36, 37, 37, 1)$ lies on line ℓ_6
 266 : $P_{159912} = (39, 1, 38, 1)$ lies on line ℓ_5
 267 : $P_{162280} = (39, 38, 38, 1)$ lies on line ℓ_6
 268 : $P_{164007} = (38, 1, 39, 1)$ lies on line ℓ_5
 269 : $P_{166439} = (38, 39, 39, 1)$ lies on line ℓ_6
 270 : $P_{168106} = (41, 1, 40, 1)$ lies on line ℓ_5
 271 : $P_{170602} = (41, 40, 40, 1)$ lies on line ℓ_6
 272 : $P_{172201} = (40, 1, 41, 1)$ lies on line ℓ_5
 273 : $P_{174761} = (40, 41, 41, 1)$ lies on line ℓ_6
 274 : $P_{176300} = (43, 1, 42, 1)$ lies on line ℓ_5
 275 : $P_{178924} = (43, 42, 42, 1)$ lies on line ℓ_6
 276 : $P_{180395} = (42, 1, 43, 1)$ lies on line ℓ_5
 277 : $P_{183083} = (42, 43, 43, 1)$ lies on line ℓ_6
 278 : $P_{184494} = (45, 1, 44, 1)$ lies on line ℓ_5
 279 : $P_{187246} = (45, 44, 44, 1)$ lies on line ℓ_6
 280 : $P_{188589} = (44, 1, 45, 1)$ lies on line ℓ_5
 281 : $P_{191405} = (44, 45, 45, 1)$ lies on line ℓ_6
 282 : $P_{192688} = (47, 1, 46, 1)$ lies on line ℓ_5
 283 : $P_{195568} = (47, 46, 46, 1)$ lies on line ℓ_6
 284 : $P_{196783} = (46, 1, 47, 1)$ lies on line ℓ_5
 285 : $P_{199727} = (46, 47, 47, 1)$ lies on line ℓ_6
 286 : $P_{200882} = (49, 1, 48, 1)$ lies on line ℓ_5
 287 : $P_{203890} = (49, 48, 48, 1)$ lies on line ℓ_6
 288 : $P_{204977} = (48, 1, 49, 1)$ lies on line ℓ_5
 289 : $P_{208049} = (48, 49, 49, 1)$ lies on line ℓ_6
 290 : $P_{209076} = (51, 1, 50, 1)$ lies on line ℓ_5
 291 : $P_{212212} = (51, 50, 50, 1)$ lies on line ℓ_6
 292 : $P_{213171} = (50, 1, 51, 1)$ lies on line ℓ_5
 293 : $P_{216371} = (50, 51, 51, 1)$ lies on line ℓ_6
 294 : $P_{217270} = (53, 1, 52, 1)$ lies on line ℓ_5
 295 : $P_{220534} = (53, 52, 52, 1)$ lies on line ℓ_6
 296 : $P_{221365} = (52, 1, 53, 1)$ lies on line ℓ_5
 297 : $P_{224693} = (52, 53, 53, 1)$ lies on line ℓ_6
 298 : $P_{225464} = (55, 1, 54, 1)$ lies on line ℓ_5
 299 : $P_{228856} = (55, 54, 54, 1)$ lies on line ℓ_6
 300 : $P_{229559} = (54, 1, 55, 1)$ lies on line ℓ_5
 301 : $P_{233015} = (54, 55, 55, 1)$ lies on line ℓ_6
 302 : $P_{233537} = (0, 0, 56, 1)$ lies on line ℓ_2
 303 : $P_{233601} = (0, 1, 56, 1)$ lies on line ℓ_2

304 : $P_{233658} = (57, 1, 56, 1)$ lies on line ℓ_5
 305 : $P_{233665} = (0, 2, 56, 1)$ lies on line ℓ_2
 306 : $P_{233729} = (0, 3, 56, 1)$ lies on line ℓ_2
 307 : $P_{233793} = (0, 4, 56, 1)$ lies on line ℓ_2
 308 : $P_{233857} = (0, 5, 56, 1)$ lies on line ℓ_2
 309 : $P_{233921} = (0, 6, 56, 1)$ lies on line ℓ_2
 310 : $P_{233985} = (0, 7, 56, 1)$ lies on line ℓ_2
 311 : $P_{234049} = (0, 8, 56, 1)$ lies on line ℓ_2
 312 : $P_{234113} = (0, 9, 56, 1)$ lies on line ℓ_2
 313 : $P_{234177} = (0, 10, 56, 1)$ lies on line ℓ_2
 314 : $P_{234241} = (0, 11, 56, 1)$ lies on line ℓ_2
 315 : $P_{234305} = (0, 12, 56, 1)$ lies on line ℓ_2
 316 : $P_{234369} = (0, 13, 56, 1)$ lies on line ℓ_2
 317 : $P_{234433} = (0, 14, 56, 1)$ lies on line ℓ_2
 318 : $P_{234497} = (0, 15, 56, 1)$ lies on line ℓ_2
 319 : $P_{234561} = (0, 16, 56, 1)$ lies on line ℓ_2
 320 : $P_{234625} = (0, 17, 56, 1)$ lies on line ℓ_2
 321 : $P_{234689} = (0, 18, 56, 1)$ lies on line ℓ_2
 322 : $P_{234753} = (0, 19, 56, 1)$ lies on line ℓ_2
 323 : $P_{234817} = (0, 20, 56, 1)$ lies on line ℓ_2
 324 : $P_{234881} = (0, 21, 56, 1)$ lies on line ℓ_2
 325 : $P_{234945} = (0, 22, 56, 1)$ lies on line ℓ_2
 326 : $P_{235009} = (0, 23, 56, 1)$ lies on line ℓ_2
 327 : $P_{235073} = (0, 24, 56, 1)$ lies on line ℓ_2
 328 : $P_{235137} = (0, 25, 56, 1)$ lies on line ℓ_2
 329 : $P_{235201} = (0, 26, 56, 1)$ lies on line ℓ_2
 330 : $P_{235265} = (0, 27, 56, 1)$ lies on line ℓ_2
 331 : $P_{235329} = (0, 28, 56, 1)$ lies on line ℓ_2
 332 : $P_{235393} = (0, 29, 56, 1)$ lies on line ℓ_2
 333 : $P_{235457} = (0, 30, 56, 1)$ lies on line ℓ_2
 334 : $P_{235521} = (0, 31, 56, 1)$ lies on line ℓ_2
 335 : $P_{235585} = (0, 32, 56, 1)$ lies on line ℓ_2
 336 : $P_{235649} = (0, 33, 56, 1)$ lies on line ℓ_2
 337 : $P_{235713} = (0, 34, 56, 1)$ lies on line ℓ_2
 338 : $P_{235777} = (0, 35, 56, 1)$ lies on line ℓ_2
 339 : $P_{235841} = (0, 36, 56, 1)$ lies on line ℓ_2
 340 : $P_{235905} = (0, 37, 56, 1)$ lies on line ℓ_2
 341 : $P_{235969} = (0, 38, 56, 1)$ lies on line ℓ_2
 342 : $P_{236033} = (0, 39, 56, 1)$ lies on line ℓ_2
 343 : $P_{236097} = (0, 40, 56, 1)$ lies on line ℓ_2
 344 : $P_{236161} = (0, 41, 56, 1)$ lies on line ℓ_2
 345 : $P_{236225} = (0, 42, 56, 1)$ lies on line ℓ_2
 346 : $P_{236289} = (0, 43, 56, 1)$ lies on line ℓ_2
 347 : $P_{236353} = (0, 44, 56, 1)$ lies on line ℓ_2
 348 : $P_{236417} = (0, 45, 56, 1)$ lies on line ℓ_2
 349 : $P_{236481} = (0, 46, 56, 1)$ lies on line ℓ_2
 350 : $P_{236545} = (0, 47, 56, 1)$ lies on line ℓ_2
 351 : $P_{236609} = (0, 48, 56, 1)$ lies on line ℓ_2
 352 : $P_{236673} = (0, 49, 56, 1)$ lies on line ℓ_2
 353 : $P_{236737} = (0, 50, 56, 1)$ lies on line ℓ_2
 354 : $P_{236801} = (0, 51, 56, 1)$ lies on line ℓ_2
 355 : $P_{236865} = (0, 52, 56, 1)$ lies on line ℓ_2
 356 : $P_{236929} = (0, 53, 56, 1)$ lies on line ℓ_2
 357 : $P_{236993} = (0, 54, 56, 1)$ lies on line ℓ_2

358 : $P_{237057} = (0, 55, 56, 1)$ lies on line ℓ_2
 359 : $P_{237121} = (0, 56, 56, 1)$ lies on line ℓ_2
 360 : $P_{237178} = (57, 56, 56, 1)$ lies on line ℓ_6
 361 : $P_{237185} = (0, 57, 56, 1)$ lies on line ℓ_2
 362 : $P_{237249} = (0, 58, 56, 1)$ lies on line ℓ_2
 363 : $P_{237313} = (0, 59, 56, 1)$ lies on line ℓ_2
 364 : $P_{237377} = (0, 60, 56, 1)$ lies on line ℓ_2
 365 : $P_{237441} = (0, 61, 56, 1)$ lies on line ℓ_2
 366 : $P_{237505} = (0, 62, 56, 1)$ lies on line ℓ_2
 367 : $P_{237569} = (0, 63, 56, 1)$ lies on line ℓ_2
 368 : $P_{237633} = (0, 0, 57, 1)$ lies on line ℓ_3
 369 : $P_{237697} = (0, 1, 57, 1)$ lies on line ℓ_3
 370 : $P_{237753} = (56, 1, 57, 1)$ lies on line ℓ_5
 371 : $P_{237761} = (0, 2, 57, 1)$ lies on line ℓ_3
 372 : $P_{237825} = (0, 3, 57, 1)$ lies on line ℓ_3
 373 : $P_{237889} = (0, 4, 57, 1)$ lies on line ℓ_3
 374 : $P_{237953} = (0, 5, 57, 1)$ lies on line ℓ_3
 375 : $P_{238017} = (0, 6, 57, 1)$ lies on line ℓ_3
 376 : $P_{238081} = (0, 7, 57, 1)$ lies on line ℓ_3
 377 : $P_{238145} = (0, 8, 57, 1)$ lies on line ℓ_3
 378 : $P_{238209} = (0, 9, 57, 1)$ lies on line ℓ_3
 379 : $P_{238273} = (0, 10, 57, 1)$ lies on line ℓ_3
 380 : $P_{238337} = (0, 11, 57, 1)$ lies on line ℓ_3
 381 : $P_{238401} = (0, 12, 57, 1)$ lies on line ℓ_3
 382 : $P_{238465} = (0, 13, 57, 1)$ lies on line ℓ_3
 383 : $P_{238529} = (0, 14, 57, 1)$ lies on line ℓ_3
 384 : $P_{238593} = (0, 15, 57, 1)$ lies on line ℓ_3
 385 : $P_{238657} = (0, 16, 57, 1)$ lies on line ℓ_3
 386 : $P_{238721} = (0, 17, 57, 1)$ lies on line ℓ_3
 387 : $P_{238785} = (0, 18, 57, 1)$ lies on line ℓ_3
 388 : $P_{238849} = (0, 19, 57, 1)$ lies on line ℓ_3
 389 : $P_{238913} = (0, 20, 57, 1)$ lies on line ℓ_3
 390 : $P_{238977} = (0, 21, 57, 1)$ lies on line ℓ_3
 391 : $P_{239041} = (0, 22, 57, 1)$ lies on line ℓ_3
 392 : $P_{239105} = (0, 23, 57, 1)$ lies on line ℓ_3
 393 : $P_{239169} = (0, 24, 57, 1)$ lies on line ℓ_3
 394 : $P_{239233} = (0, 25, 57, 1)$ lies on line ℓ_3
 395 : $P_{239297} = (0, 26, 57, 1)$ lies on line ℓ_3
 396 : $P_{239361} = (0, 27, 57, 1)$ lies on line ℓ_3
 397 : $P_{239425} = (0, 28, 57, 1)$ lies on line ℓ_3
 398 : $P_{239489} = (0, 29, 57, 1)$ lies on line ℓ_3
 399 : $P_{239553} = (0, 30, 57, 1)$ lies on line ℓ_3
 400 : $P_{239617} = (0, 31, 57, 1)$ lies on line ℓ_3
 401 : $P_{239681} = (0, 32, 57, 1)$ lies on line ℓ_3
 402 : $P_{239745} = (0, 33, 57, 1)$ lies on line ℓ_3
 403 : $P_{239809} = (0, 34, 57, 1)$ lies on line ℓ_3
 404 : $P_{239873} = (0, 35, 57, 1)$ lies on line ℓ_3
 405 : $P_{239937} = (0, 36, 57, 1)$ lies on line ℓ_3
 406 : $P_{240001} = (0, 37, 57, 1)$ lies on line ℓ_3
 407 : $P_{240065} = (0, 38, 57, 1)$ lies on line ℓ_3
 408 : $P_{240129} = (0, 39, 57, 1)$ lies on line ℓ_3
 409 : $P_{240193} = (0, 40, 57, 1)$ lies on line ℓ_3
 410 : $P_{240257} = (0, 41, 57, 1)$ lies on line ℓ_3
 411 : $P_{240321} = (0, 42, 57, 1)$ lies on line ℓ_3
 412 : $P_{240385} = (0, 43, 57, 1)$ lies on line ℓ_3
 413 : $P_{240449} = (0, 44, 57, 1)$ lies on line ℓ_3
 414 : $P_{240513} = (0, 45, 57, 1)$ lies on line ℓ_3
 415 : $P_{240577} = (0, 46, 57, 1)$ lies on line ℓ_3
 416 : $P_{240641} = (0, 47, 57, 1)$ lies on line ℓ_3
 417 : $P_{240705} = (0, 48, 57, 1)$ lies on line ℓ_3
 418 : $P_{240769} = (0, 49, 57, 1)$ lies on line ℓ_3
 419 : $P_{240833} = (0, 50, 57, 1)$ lies on line ℓ_3
 420 : $P_{240897} = (0, 51, 57, 1)$ lies on line ℓ_3
 421 : $P_{240961} = (0, 52, 57, 1)$ lies on line ℓ_3
 422 : $P_{241025} = (0, 53, 57, 1)$ lies on line ℓ_3
 423 : $P_{241089} = (0, 54, 57, 1)$ lies on line ℓ_3
 424 : $P_{241153} = (0, 55, 57, 1)$ lies on line ℓ_3
 425 : $P_{241217} = (0, 56, 57, 1)$ lies on line ℓ_3
 426 : $P_{241281} = (0, 57, 57, 1)$ lies on line ℓ_3
 427 : $P_{241337} = (56, 57, 57, 1)$ lies on line ℓ_6
 428 : $P_{241345} = (0, 58, 57, 1)$ lies on line ℓ_3
 429 : $P_{241409} = (0, 59, 57, 1)$ lies on line ℓ_3
 430 : $P_{241473} = (0, 60, 57, 1)$ lies on line ℓ_3
 431 : $P_{241537} = (0, 61, 57, 1)$ lies on line ℓ_3
 432 : $P_{241601} = (0, 62, 57, 1)$ lies on line ℓ_3
 433 : $P_{241665} = (0, 63, 57, 1)$ lies on line ℓ_3
 434 : $P_{241852} = (59, 1, 58, 1)$ lies on line ℓ_5
 435 : $P_{245500} = (59, 58, 58, 1)$ lies on line ℓ_6
 436 : $P_{245947} = (58, 1, 59, 1)$ lies on line ℓ_5
 437 : $P_{249659} = (58, 59, 59, 1)$ lies on line ℓ_6
 438 : $P_{250046} = (61, 1, 60, 1)$ lies on line ℓ_5
 439 : $P_{253822} = (61, 60, 60, 1)$ lies on line ℓ_6
 440 : $P_{254141} = (60, 1, 61, 1)$ lies on line ℓ_5
 441 : $P_{257981} = (60, 61, 61, 1)$ lies on line ℓ_6
 442 : $P_{258240} = (63, 1, 62, 1)$ lies on line ℓ_5
 443 : $P_{262144} = (63, 62, 62, 1)$ lies on line ℓ_6
 444 : $P_{262335} = (62, 1, 63, 1)$ lies on line ℓ_5
 445 : $P_{266303} = (62, 63, 63, 1)$ lies on line ℓ_6

The single points on the surface are:

Points on surface but on no line

The surface has 3840 points not on any line:
Too many to print.

Line Intersection Graph

	0	1	2	3	4	5	6
0	0	1	0	0	1	0	0
1	1	0	1	1	1	1	1
2	0	1	0	1	0	0	0
3	0	1	1	0	0	0	0
4	1	1	0	0	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_4
in point	P_{8258}	P_{8258}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6
in point	P_{8258}	P_1	P_1	P_{8258}	P_{8322}	P_{8322}

Line 2 intersects

Line	ℓ_1	ℓ_3
in point	P_1	P_1

Line 3 intersects

Line	ℓ_1	ℓ_2
in point	P_1	P_1

Line 4 intersects

Line	ℓ_0	ℓ_1
in point	P_{8258}	P_{8258}

Line 5 intersects

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

Line 6 intersects

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

The surface has 4289 points:

Too many to print.