MPS 文件数学模型提取

完整版

MPS Extractor

2025 年 7 月 8 日

目录

1 模型概览

文件名: `ran12x12.mps`

模型名: RAN12X12

变量总数: 288

约束总数: 168

优化方向: Minimize

2 目标函数

目标函数摘要:

$$\min \quad Z = \sum_i c_i Y_i + \sum_j d_j X_j \tag{1}$$

Y 变量: 144 个，系数范围 $[50, 198]$

X 变量: 144 个，系数范围 $[1, 10]$

完整目标函数:

$$\min \quad Z = 194Y_{142} + 105Y_0 + 129Y_1 \tag{2}$$
$$+ 70Y_2 + 197Y_3 + 63Y_4 \tag{3}$$
$$+ 80Y_5 + 170Y_6 + 172Y_7 \tag{4}$$
$$+ 175Y_8 + 134Y_9 + 182Y_{10} \tag{5}$$
$$+ 139Y_{11} + 117Y_{12} + 97Y_{13} \tag{6}$$
$$+ 94Y_{14} + 167Y_{15} + 181Y_{16} \tag{7}$$
$$+ 175Y_{17} + 111Y_{18} + 125Y_{19} \tag{8}$$
$$+ 185Y_{20} + 128Y_{21} + 121Y_{22} \tag{9}$$
$$+ 84Y_{23} + 73Y_{24} + 100Y_{25} \tag{10}$$
$$+ 90Y_{26} + 128Y_{27} + 93Y_{28} \tag{11}$$
$$+ 145Y_{29} + 193Y_{30} + 171Y_{31} \tag{12}$$
$$+ 134Y_{32} + 76Y_{33} + 189Y_{34} \tag{13}$$
$$+ 69Y_{35} + 73Y_{36} + 173Y_{37} \tag{14}$$
$$+ 53Y_{38} + 179Y_{39} + 121Y_{40} \tag{15}$$
$$+ 182Y_{41} + 133Y_{42} + 140Y_{43} \tag{16}$$
$$+ 158Y_{44} + 158Y_{45} + 73Y_{46} \tag{17}$$
$$+ 105Y_{47} + 79Y_{48} + 63Y_{49} \tag{18}$$
$$+ 90Y_{50} + 114Y_{51} + 80Y_{52} \tag{19}$$
$$+ 131Y_{53} + 196Y_{54} + 140Y_{55} \tag{20}$$
$$+ 74Y_{56} + 180Y_{57} + 171Y_{58} \tag{21}$$
$$+ 144Y_{59} + 103Y_{60} + 132Y_{61} \tag{22}$$
$$+ 126Y_{62} + 62Y_{63} + 196Y_{64} \tag{23}$$
$$+ 142Y_{65} + 128Y_{66} + 123Y_{67} \tag{24}$$
$$+ 137Y_{68} + 188Y_{69} + 145Y_{70} \tag{25}$$

$$+ 129Y_{71} + 73Y_{72} + 93Y_{73} \tag{26}$$

$$+ 96Y_{74} + 139Y_{75} + 180Y_{76} \tag{27}$$

$$+ 106Y_{77} + 87Y_{78} + 142Y_{79} \tag{28}$$

$$+ 89Y_{80} + 121Y_{81} + 182Y_{82} \tag{29}$$

$$+ 119Y_{83} + 176Y_{84} + 64Y_{85} \tag{30}$$

$$+ 72Y_{86} + 55Y_{87} + 61Y_{88} \tag{31}$$

$$+ 61Y_{89} + 139Y_{90} + 158Y_{91} \tag{32}$$

$$+ 91Y_{92} + 192Y_{93} + 189Y_{94} \tag{33}$$

$$+ 58Y_{95} + 65Y_{96} + 159Y_{97} \tag{34}$$

$$+ 190Y_{98} + 153Y_{99} + 62Y_{100} \tag{35}$$

$$+ 77Y_{101} + 66Y_{102} + 106Y_{103} \tag{36}$$

$$+ 172Y_{104} + 90Y_{105} + 66Y_{106} \tag{37}$$

$$+ 156Y_{107} + 66Y_{108} + 193Y_{109} \tag{38}$$

$$+ 164Y_{110} + 76Y_{111} + 198Y_{112} \tag{39}$$

$$+ 56Y_{113} + 133Y_{114} + 195Y_{115} \tag{40}$$

$$+ 177Y_{116} + 173Y_{117} + 91Y_{118} \tag{41}$$

$$+ 154Y_{119} + 99Y_{120} + 50Y_{121} \tag{42}$$

$$+ 80Y_{122} + 142Y_{123} + 137Y_{124} \tag{43}$$

$$+ 66Y_{125} + 132Y_{126} + 130Y_{127} \tag{44}$$

$$+ 122Y_{128} + 57Y_{129} + 152Y_{130} \tag{45}$$

$$+ 68Y_{131} + 98Y_{132} + 100Y_{133} \tag{46}$$

$$+ 176Y_{134} + 102Y_{135} + 90Y_{136} \tag{47}$$

$$+ 96Y_{137} + 191Y_{138} + 197Y_{139} \tag{48}$$

$$+ 133Y_{140} + 66Y_{141} + 90Y_{143} \tag{49}$$

$$+ 7X_0 + 10X_1 + 1X_2 \tag{50}$$

$$+ 3X_3 + 5X_4 + 5X_5 \tag{51}$$

$$+ 2X_6 + 8X_7 + 8X_8 \tag{52}$$

$$+ 7X_9 + 10X_{10} + 1X_{11} \tag{53}$$

$$+ 4X_{12} + 4X_{13} + 10X_{14} \tag{54}$$

$$+ 3X_{15} + 2X_{16} + 6X_{17} \tag{55}$$

$$+ 10X_{18} + 6X_{19} + 6X_{20} \tag{56}$$

$$+ 9X_{21} + 9X_{22} + 6X_{23} \tag{57}$$

$$+ 4X_{24} + 1X_{25} + 1X_{26} \tag{58}$$

$$+ 10X_{27} + 9X_{28} + 6X_{29} \tag{59}$$

$$+ 8X_{30} + 9X_{31} + 7X_{32} \tag{60}$$

$$+ 9X_{33} + 1X_{34} + 2X_{35} \tag{61}$$

$$+ 7X_{36} + 10X_{37} + 4X_{38} \tag{62}$$

$$+ 1X_{39} + 10X_{40} + 10X_{41} \tag{63}$$

$$+ 5X_{42} + 2X_{43} + 2X_{44} \tag{64}$$

$$+ 2X_{45} + 7X_{46} + 7X_{47} \tag{65}$$

$$+ 2X_{48} + 5X_{49} + 2X_{50} \tag{66}$$

$$+ 7X_{51} + 5X_{52} + 2X_{53} \tag{67}$$

$$+ 4X_{54} + 3X_{55} + 6X_{56} \tag{68}$$

$$+ 3X_{57} + 2X_{58} + 8X_{59} \tag{69}$$

$$+ 10X_{60} + 4X_{61} + 7X_{62} \tag{70}$$

$$+ 3X_{63} + 4X_{64} + 3X_{65} \tag{71}$$

$$+ 10X_{66} + 8X_{67} + 8X_{68} \tag{72}$$

$$+ 3X_{69} + 6X_{70} + 10X_{71} \tag{73}$$

$$+ 7X_{72} + 10X_{73} + 8X_{74} \tag{74}$$

$$+ 1X_{75} + 2X_{76} + 5X_{77} \tag{75}$$

$$+ 4X_{78} + 3X_{79} + 5X_{80} \tag{76}$$

$$+ 9X_{81} + 8X_{82} + 1X_{83} \tag{77}$$

$$+ 7X_{84} + 7X_{85} + 5X_{86} \tag{78}$$

$$+ 6X_{87} + 2X_{88} + 4X_{89} \tag{79}$$

$$+ 1X_{90} + 3X_{91} + 2X_{92} \tag{80}$$

$$+ 9X_{93} + 3X_{94} + 10X_{95} \tag{81}$$

$$+ 7X_{96} + 1X_{97} + 10X_{98} \tag{82}$$

$$+ 8X_{99} + 3X_{100} + 9X_{101} \tag{83}$$

$$+ 9X_{102} + 5X_{103} + 8X_{104} \tag{84}$$

$$+ 1X_{105} + 9X_{106} + 9X_{107} \tag{85}$$

$$+ 7X_{108} + 7X_{109} + 10X_{110} \tag{86}$$

$$+ 10X_{111} + 2X_{112} + 8X_{113} \tag{87}$$

$$+ 5X_{114} + 5X_{115} + 3X_{116} \tag{88}$$

$$+ 9X_{117} + 2X_{118} + 7X_{119} \tag{89}$$

$$+ 1X_{120} + 1X_{121} + 1X_{122} \tag{90}$$

$$+ 3X_{123} + 8X_{124} + 7X_{125} \tag{91}$$

$$+ 3X_{126} + 1X_{127} + 8X_{128} \tag{92}$$

$$+ 8X_{129} + 4X_{130} + 10X_{131} \tag{93}$$

$$+ 5X_{132} + 3X_{133} + 4X_{134} \tag{94}$$

$$+ 10X_{135} + 1X_{136} + 8X_{137} \tag{95}$$

$$+ 10X_{138} + 4X_{139} + 5X_{140} \tag{96}$$

$$+ 9X_{141} + 6X_{142} + 1X_{143}$$

3 约束条件

3.1 等式约束 (24 个)

$$X_0 + X_1 + X_2 + X_3 + X_4 + X_5 \tag{97}$$

$$+ X_6 + X_7 + X_8 + X_9 + X_{10} + X_{11} \qquad = +23 \qquad \text{(A0)} \tag{98}$$

$$X_{12} + X_{13} + X_{14} + X_{15} + X_{16} + X_{17} \tag{99}$$

$$+ X_{18} + X_{19} + X_{20} + X_{21} + X_{22} + X_{23} \quad = +5 \quad \text{(A1)} \tag{100}$$

$$X_{24} + X_{25} + X_{26} + X_{27} + X_{28} + X_{29} \tag{101}$$

$$+ X_{30} + X_{31} + X_{32} + X_{33} + X_{34} + X_{35} \quad = +19 \quad \text{(A2)} \tag{102}$$

$$X_{36} + X_{37} + X_{38} + X_{39} + X_{40} + X_{41} \tag{103}$$

$$+ X_{42} + X_{43} + X_{44} + X_{45} + X_{46} + X_{47} \quad = +26 \quad \text{(A3)} \tag{104}$$

$$X_{48} + X_{49} + X_{50} + X_{51} + X_{52} + X_{53} \tag{105}$$

$$+ X_{54} + X_{55} + X_{56} + X_{57} + X_{58} + X_{59} \quad = +4 \quad \text{(A4)} \tag{106}$$

$$X_{60} + X_{61} + X_{62} + X_{63} + X_{64} + X_{65} \tag{107}$$

$$+ X_{66} + X_{67} + X_{68} + X_{69} + X_{70} + X_{71} \quad = +21 \quad \text{(A5)} \tag{108}$$

$$X_{72} + X_{73} + X_{74} + X_{75} + X_{76} + X_{77} \tag{109}$$

$$+ X_{78} + X_{79} + X_{80} + X_{81} + X_{82} + X_{83} \quad = +12 \quad \text{(A6)} \tag{110}$$

$$X_{84} + X_{85} + X_{86} + X_{87} + X_{88} + X_{89} \tag{111}$$

$$+ X_{90} + X_{91} + X_{92} + X_{93} + X_{94} + X_{95} \quad = +16 \quad \text{(A7)} \tag{112}$$

$$X_{96} + X_{97} + X_{98} + X_{99} + X_{100} + X_{101} \tag{113}$$

$$+ X_{102} + X_{103} + X_{104} + X_{105} + X_{106} + X_{107} \quad = +24 \quad \text{(A8)} \tag{114}$$

$$X_{108} + X_{109} + X_{110} + X_{111} + X_{112} + X_{113} \tag{115}$$

$$+ X_{114} + X_{115} + X_{116} + X_{117} + X_{118} + X_{119} \quad = +17 \quad \text{(A9)} \tag{116}$$

$$= +19 \quad \text{(C\_11)} \tag{117}$$

$$= +14 \quad \text{(C\_12)} \tag{118}$$

$$X_0 + X_{12} + X_{24} + X_{36} + X_{48} + X_{60} \tag{119}$$

$$+ X_{72} + X_{84} + X_{96} + X_{108} + X_{120} + X_{132} \quad = +7 \quad \text{(B0)} \tag{120}$$

$$X_1 + X_{13} + X_{25} + X_{37} + X_{49} + X_{61} \tag{121}$$

$$+ X_{73} + X_{85} + X_{97} + X_{109} + X_{121} + X_{133} \quad = +6 \quad \text{(B1)} \tag{122}$$

$$X_2 + X_{14} + X_{26} + X_{38} + X_{50} + X_{62} \tag{123}$$

$$+ X_{74} + X_{86} + X_{98} + X_{110} + X_{122} + X_{134} \quad = +17 \quad \text{(B2)} \tag{124}$$

$$X_3 + X_{15} + X_{27} + X_{39} + X_{51} + X_{63} \tag{125}$$

$$+ X_{75} + X_{87} + X_{99} + X_{111} + X_{123} + X_{135} \quad = +6 \quad \text{(B3)} \tag{126}$$

$$X_4 + X_{16} + X_{28} + X_{40} + X_{52} + X_{64} \tag{127}$$

$$+ X_{76} + X_{88} + X_{100} + X_{112} + X_{124} + X_{136} \quad = +32 \quad \text{(B4)} \tag{128}$$

$$X_5 + X_{17} + X_{29} + X_{41} + X_{53} + X_{65} \tag{129}$$

$$+ X_{77} + X_{89} + X_{101} + X_{113} + X_{125} + X_{137} \quad = +20 \quad \text{(B5)} \tag{130}$$

$$X_6 + X_{18} + X_{30} + X_{42} + X_{54} + X_{66} \tag{131}$$

$$+ X_{78} + X_{90} + X_{102} + X_{114} + X_{126} + X_{138} \quad = +11 \quad \text{(B6)} \tag{132}$$

$$X_7 + X_{19} + X_{31} + X_{43} + X_{55} + X_{67} \tag{133}$$

$$+ X_{79} + X_{91} + X_{103} + X_{115} + X_{127} + X_{139} \quad = +3 \quad \text{(B7)} \tag{134}$$

$$X_8 + X_{20} + X_{32} + X_{44} + X_{56} + X_{68} \tag{135}$$

$$+ X_{80} + X_{92} + X_{104} + X_{116} + X_{128} + X_{140} \quad = +44 \quad \text{(B8)} \tag{136}$$

$$X_9 + X_{21} + X_{33} + X_{45} + X_{57} + X_{69} \tag{137}$$

$$+ X_{81} + X_{93} + X_{105} + X_{117} + X_{129} + X_{141} \quad = +10 \quad \text{(B9)} \tag{138}$$

$$X_{10} + X_{22} + X_{34} + X_{46} + X_{58} + X_{70} \tag{139}$$

$$+ X_{82} + X_{94} + X_{106} + X_{118} + X_{130} + X_{142} \quad = +19 \quad \text{(B10)} \tag{140}$$

$$X_{11} + X_{23} + X_{35} + X_{47} + X_{59} + X_{71} \tag{141}$$

$$+ X_{83} + X_{95} + X_{107} + X_{119} + X_{131} + X_{143} \quad = +25 \qquad \text{(B11)} \tag{142}$$

$$\tag{143}$$

3.2 不等式约束 (146 个)

$$X_0 - 7Y_0 \leq +0 \qquad \text{(G0)} \tag{144}$$

$$X_1 - 6Y_1 \leq +0 \qquad \text{(G1)} \tag{145}$$

$$X_2 - 17Y_2 \leq +0 \qquad \text{(G2)} \tag{146}$$

$$X_3 - 6Y_3 \leq +0 \qquad \text{(G3)} \tag{147}$$

$$X_4 - 23Y_4 \leq +0 \qquad \text{(G4)} \tag{148}$$

$$X_5 - 20Y_5 \leq +0 \qquad \text{(G5)} \tag{149}$$

$$X_6 - 11Y_6 \leq +0 \qquad \text{(G6)} \tag{150}$$

$$X_7 - 3Y_7 \leq +0 \qquad \text{(G7)} \tag{151}$$

$$X_8 - 23Y_8 \leq +0 \qquad \text{(G8)} \tag{152}$$

$$X_9 - 10Y_9 \leq +0 \qquad \text{(G9)} \tag{153}$$

$$X_{10} - 19Y_{10} \leq +0 \qquad \text{(G10)} \tag{154}$$

$$X_{11} - 23Y_{11} \leq +0 \qquad \text{(G11)} \tag{155}$$

$$X_{12} - 5Y_{12} \leq +0 \qquad \text{(G12)} \tag{156}$$

$$X_{13} - 5Y_{13} \leq +0 \qquad \text{(G13)} \tag{157}$$

$$X_{14} - 5Y_{14} \leq +0 \qquad \text{(G14)} \tag{158}$$

$$X_{15} - 5Y_{15} \leq +0 \qquad \text{(G15)} \tag{159}$$

$$X_{16} - 5Y_{16} \leq +0 \qquad \text{(G16)} \tag{160}$$

$$X_{17} - 5Y_{17} \leq +0 \qquad \text{(G17)} \tag{161}$$

$$X_{18} - 5Y_{18} \leq +0 \qquad \text{(G18)} \tag{162}$$

$$X_{19} - 3Y_{19} \leq +0 \qquad \text{(G19)} \tag{163}$$

$$X_{20} - 5Y_{20} \leq +0 \qquad \text{(G20)} \tag{164}$$

$$X_{21} - 5Y_{21} \leq +0 \qquad \text{(G21)} \tag{165}$$

$$X_{22} - 5Y_{22} \leq +0 \qquad \text{(G22)} \tag{166}$$

$$X_{23} - 5Y_{23} \leq +0 \qquad \text{(G23)} \tag{167}$$

$$X_{24} - 7Y_{24} \leq +0 \qquad \text{(G24)} \tag{168}$$

$$X_{25} - 6Y_{25} \leq +0 \qquad \text{(G25)} \tag{169}$$

$$X_{26} - 17Y_{26} \leq +0 \qquad \text{(G26)} \tag{170}$$

$$X_{27} - 6Y_{27} \leq +0 \qquad \text{(G27)} \tag{171}$$

$$X_{28} - 19Y_{28} \leq +0 \qquad \text{(G28)} \tag{172}$$

$$X_{29} - 19Y_{29} \leq +0 \qquad \text{(G29)} \tag{173}$$

$$X_{30} - 11Y_{30} \leq +0 \qquad \text{(G30)} \tag{174}$$

$$X_{31} - 3Y_{31} \leq +0 \qquad \text{(G31)} \tag{175}$$

$$X_{32} - 19Y_{32} \leq +0 \qquad \text{(G32)} \tag{176}$$

$$X_{33} - 10Y_{33} \leq +0 \qquad \text{(G33)} \tag{177}$$

$$X_{34} - 19Y_{34} \leq +0 \qquad \text{(G34)} \tag{178}$$

$$X_{35} - 19Y_{35} \leq +0 \qquad \text{(G35)} \tag{179}$$

$$X_{36} - 7Y_{36} \leq +0 \tag{G36} \tag{180}$$

$$X_{37} - 6Y_{37} \leq +0 \tag{G37} \tag{181}$$

$$X_{38} - 17Y_{38} \leq +0 \tag{G38} \tag{182}$$

$$X_{39} - 6Y_{39} \leq +0 \tag{G39} \tag{183}$$

$$X_{40} - 26Y_{40} \leq +0 \tag{G40} \tag{184}$$

$$X_{41} - 20Y_{41} \leq +0 \tag{G41} \tag{185}$$

$$X_{42} - 11Y_{42} \leq +0 \tag{G42} \tag{186}$$

$$X_{43} - 3Y_{43} \leq +0 \tag{G43} \tag{187}$$

$$X_{44} - 26Y_{44} \leq +0 \tag{G44} \tag{188}$$

$$X_{45} - 10Y_{45} \leq +0 \tag{G45} \tag{189}$$

$$X_{46} - 19Y_{46} \leq +0 \tag{G46} \tag{190}$$

$$X_{47} - 25Y_{47} \leq +0 \tag{G47} \tag{191}$$

$$X_{48} - 4Y_{48} \leq +0 \tag{G48} \tag{192}$$

$$X_{49} - 4Y_{49} \leq +0 \tag{G49} \tag{193}$$

$$X_{50} - 4Y_{50} \leq +0 \tag{G50} \tag{194}$$

$$X_{51} - 4Y_{51} \leq +0 \tag{G51} \tag{195}$$

$$X_{52} - 4Y_{52} \leq +0 \tag{G52} \tag{196}$$

$$X_{53} - 4Y_{53} \leq +0 \tag{G53} \tag{197}$$

$$X_{54} - 4Y_{54} \leq +0 \tag{G54} \tag{198}$$

$$X_{55} - 3Y_{55} \leq +0 \tag{G55} \tag{199}$$

$$X_{56} - 4Y_{56} \leq +0 \tag{G56} \tag{200}$$

$$X_{57} - 4Y_{57} \leq +0 \tag{G57} \tag{201}$$

$$X_{58} - 4Y_{58} \leq +0 \tag{G58} \tag{202}$$

$$X_{59} - 4Y_{59} \leq +0 \tag{G59} \tag{203}$$

$$X_{60} - 7Y_{60} \leq +0 \tag{G60} \tag{204}$$

$$X_{61} - 6Y_{61} \leq +0 \tag{G61} \tag{205}$$

$$X_{62} - 17Y_{62} \leq +0 \tag{G62} \tag{206}$$

$$X_{63} - 6Y_{63} \leq +0 \tag{G63} \tag{207}$$

$$X_{64} - 21Y_{64} \leq +0 \tag{G64} \tag{208}$$

$$X_{65} - 20Y_{65} \leq +0 \tag{G65} \tag{209}$$

$$X_{66} - 11Y_{66} \leq +0 \tag{G66} \tag{210}$$

$$X_{67} - 3Y_{67} \leq +0 \tag{G67} \tag{211}$$

$$X_{68} - 21Y_{68} \leq +0 \tag{G68} \tag{212}$$

$$X_{69} - 10Y_{69} \leq +0 \tag{G69} \tag{213}$$

$$X_{70} - 19Y_{70} \leq +0 \tag{G70} \tag{214}$$

$$X_{71} - 21Y_{71} \leq +0 \tag{G71} \tag{215}$$

$$X_{72} - 7Y_{72} \leq +0 \tag{G72} \tag{216}$$

$$X_{73} - 6Y_{73} \leq +0 \tag{G73} \tag{217}$$

$$X_{74} - 12Y_{74} \leq +0 \tag{G74} \tag{218}$$

$$X_{75} - 6Y_{75} \leq +0 \tag{G75} \tag{219}$$

$$X_{76} - 12Y_{76} \leq +0 \tag{G76} \tag{220}$$

$$X_{77} - 12Y_{77} \leq +0 \tag{G77} \tag{221}$$

$$X_{78} - 11Y_{78} \leq +0 \tag{G78}$$ (222)

$$X_{79} - 3Y_{79} \leq +0 \tag{G79}$$ (223)

$$X_{80} - 12Y_{80} \leq +0 \tag{G80}$$ (224)

$$X_{81} - 10Y_{81} \leq +0 \tag{G81}$$ (225)

$$X_{82} - 12Y_{82} \leq +0 \tag{G82}$$ (226)

$$X_{83} - 12Y_{83} \leq +0 \tag{G83}$$ (227)

$$X_{84} - 7Y_{84} \leq +0 \tag{G84}$$ (228)

$$X_{85} - 6Y_{85} \leq +0 \tag{G85}$$ (229)

$$X_{86} - 16Y_{86} \leq +0 \tag{G86}$$ (230)

$$X_{87} - 6Y_{87} \leq +0 \tag{G87}$$ (231)

$$X_{88} - 16Y_{88} \leq +0 \tag{G88}$$ (232)

$$X_{89} - 16Y_{89} \leq +0 \tag{G89}$$ (233)

$$X_{90} - 11Y_{90} \leq +0 \tag{G90}$$ (234)

$$X_{91} - 3Y_{91} \leq +0 \tag{G91}$$ (235)

$$X_{92} - 16Y_{92} \leq +0 \tag{G92}$$ (236)

$$X_{93} - 10Y_{93} \leq +0 \tag{G93}$$ (237)

$$X_{94} - 16Y_{94} \leq +0 \tag{G94}$$ (238)

$$X_{95} - 16Y_{95} \leq +0 \tag{G95}$$ (239)

$$X_{96} - 7Y_{96} \leq +0 \tag{G96}$$ (240)

$$X_{97} - 6Y_{97} \leq +0 \tag{G97}$$ (241)

$$X_{98} - 17Y_{98} \leq +0 \tag{G98}$$ (242)

$$X_{99} - 6Y_{99} \leq +0 \tag{G99}$$ (243)

$$X_{100} - 24Y_{100} \leq +0 \tag{G100}$$ (244)

$$X_{101} - 20Y_{101} \leq +0 \tag{G101}$$ (245)

$$X_{102} - 11Y_{102} \leq +0 \tag{G102}$$ (246)

$$X_{103} - 3Y_{103} \leq +0 \tag{G103}$$ (247)

$$X_{104} - 24Y_{104} \leq +0 \tag{G104}$$ (248)

$$X_{105} - 10Y_{105} \leq +0 \tag{G105}$$ (249)

$$X_{106} - 19Y_{106} \leq +0 \tag{G106}$$ (250)

$$X_{107} - 24Y_{107} \leq +0 \tag{G107}$$ (251)

$$X_{108} - 7Y_{108} \leq +0 \tag{G108}$$ (252)

$$X_{109} - 6Y_{109} \leq +0 \tag{G109}$$ (253)

$$X_{110} - 17Y_{110} \leq +0 \tag{G110}$$ (254)

$$X_{111} - 6Y_{111} \leq +0 \tag{G111}$$ (255)

$$X_{112} - 17Y_{112} \leq +0 \tag{G112}$$ (256)

$$X_{113} - 17Y_{113} \leq +0 \tag{G113}$$ (257)

$$X_{114} - 11Y_{114} \leq +0 \tag{G114}$$ (258)

$$X_{115} - 3Y_{115} \leq +0 \tag{G115}$$ (259)

$$X_{116} - 17Y_{116} \leq +0 \tag{G116}$$ (260)

$$X_{117} - 10Y_{117} \leq +0 \tag{G117}$$ (261)

$$X_{118} - 17Y_{118} \leq +0 \tag{G118}$$ (262)

$$X_{119} - 17Y_{119} \leq +0 \tag{G119}$$ (263)

$$X_{120} - 7Y_{120} \leq +0 \tag{G120}$$ (264)

$$X_{121} - 6Y_{121} \leq +0 \tag{G121}$$ (265)

$$X_{122} - 17Y_{122} \leq +0 \tag{G122}$$ (266)

$$X_{123} - 6Y_{123} \leq +0 \tag{G123}$$ (267)

$$X_{124} - 19Y_{124} \leq +0 \tag{G124}$$ (268)

$$X_{125} - 19Y_{125} \leq +0 \tag{G125}$$ (269)

$$X_{126} - 11Y_{126} \leq +0 \tag{G126}$$ (270)

$$X_{127} - 3Y_{127} \leq +0 \tag{G127}$$ (271)

$$X_{128} - 19Y_{128} \leq +0 \tag{G128}$$ (272)

$$X_{129} - 10Y_{129} \leq +0 \tag{G129}$$ (273)

$$X_{130} - 19Y_{130} \leq +0 \tag{G130}$$ (274)

$$X_{131} - 19Y_{131} \leq +0 \tag{G131}$$ (275)

$$X_{132} - 7Y_{132} \leq +0 \tag{G132}$$ (276)

$$X_{133} - 6Y_{133} \leq +0 \tag{G133}$$ (277)

$$X_{134} - 14Y_{134} \leq +0 \tag{G134}$$ (278)

$$X_{135} - 6Y_{135} \leq +0 \tag{G135}$$ (279)

$$X_{136} - 14Y_{136} \leq +0 \tag{G136}$$ (280)

$$X_{137} - 14Y_{137} \leq +0 \tag{G137}$$ (281)

$$X_{138} - 11Y_{138} \leq +0 \tag{G138}$$ (282)

$$X_{139} - 3Y_{139} \leq +0 \tag{G139}$$ (283)

$$X_{140} - 14Y_{140} \leq +0 \tag{G140}$$ (284)

$$X_{141} - 10Y_{141} \leq +0 \tag{G141}$$ (285)

$$X_{142} - 14Y_{142} \leq +0 \tag{G142}$$ (286)

$$X_{143} - 14Y_{143} \leq +0 \tag{G143}$$ (287)

(288)

4 变量定义

4.1 二元变量 (144 个)

$$Y_i \in \{0, 1\}, \quad i \in \{0, 1, 2, \ldots, 143\} \tag{289}$$

二元变量示例 (显示前 50 个, 共 144 个):

$Y_{142}, Y_0, Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7, Y_8,$
$Y_9, Y_{10}, Y_{11}, Y_{12}, Y_{13}, Y_{14}, Y_{15}, Y_{16}, Y_{17}, Y_{18},$
$Y_{19}, Y_{20}, Y_{21}, Y_{22}, Y_{23}, Y_{24}, Y_{25}, Y_{26}, Y_{27}, Y_{28},$
$Y_{29}, Y_{30}, Y_{31}, Y_{32}, Y_{33}, Y_{34}, Y_{35}, Y_{36}, Y_{37}, Y_{38},$
$Y_{39}, Y_{40}, Y_{41}, Y_{42}, Y_{43}, Y_{44}, Y_{45}, Y_{46}, Y_{47}, Y_{48}$

... 还有 94 个二元变量

4.2 连续变量 (144 个)

所有连续变量均为非负实数:

$$X_j \geq 0, \quad j \in \{0, 1, 2, \ldots, 143\} \tag{290}$$

连续变量说明: 模型包含 144 个连续决策变量, 所有变量的取值范围均为非负实数域。