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: `ran10x10a.mps`
模型名: name
变量总数: 200
约束总数: 120
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: 100 个，系数范围 [34, 231]
X 变量: 100 个，系数范围 [1, 9]

完整目标函数:

$$\begin{aligned}
\min \quad Z = {} & 38Y_{98} + 227Y_0 + 197Y_1 && (2)\\
& + 71Y_2 + 157Y_3 + 205Y_4 && (3)\\
& + 217Y_5 + 51Y_6 + 115Y_7 && (4)\\
& + 60Y_8 + 229Y_9 + 161Y_{10} && (5)\\
& + 138Y_{11} + 194Y_{12} + 230Y_{13} && (6)\\
& + 84Y_{14} + 118Y_{15} + 70Y_{16} && (7)\\
& + 54Y_{17} + 58Y_{18} + 114Y_{19} && (8)\\
& + 141Y_{20} + 116Y_{21} + 168Y_{22} && (9)\\
& + 199Y_{23} + 34Y_{24} + 70Y_{25} && (10)\\
& + 155Y_{26} + 203Y_{27} + 100Y_{28} && (11)\\
& + 137Y_{29} + 208Y_{30} + 192Y_{31} && (12)\\
& + 63Y_{32} + 87Y_{33} + 151Y_{34} && (13)\\
& + 205Y_{35} + 124Y_{36} + 147Y_{37} && (14)\\
& + 206Y_{38} + 112Y_{39} + 208Y_{40} && (15)\\
& + 41Y_{41} + 146Y_{42} + 184Y_{43} && (16)\\
& + 91Y_{44} + 202Y_{45} + 212Y_{46} && (17)\\
& + 41Y_{47} + 196Y_{48} + 42Y_{49} && (18)\\
& + 196Y_{50} + 100Y_{51} + 56Y_{52} && (19)\\
& + 192Y_{53} + 201Y_{54} + 157Y_{55} && (20)\\
& + 60Y_{56} + 168Y_{57} + 38Y_{58} && (21)\\
& + 183Y_{59} + 143Y_{60} + 198Y_{61} && (22)\\
& + 147Y_{62} + 181Y_{63} + 138Y_{64} && (23)\\
& + 135Y_{65} + 185Y_{66} + 224Y_{67} && (24)\\
& + 51Y_{68} + 180Y_{69} + 196Y_{70} && (25)
\end{aligned}$$

$$+ 108Y_{71} + 111Y_{72} + 79Y_{73} \tag{26}$$

$$+ 117Y_{74} + 158Y_{75} + 176Y_{76} \tag{27}$$

$$+ 203Y_{77} + 48Y_{78} + 78Y_{79} \tag{28}$$

$$+ 93Y_{80} + 231Y_{81} + 77Y_{82} \tag{29}$$

$$+ 101Y_{83} + 82Y_{84} + 144Y_{85} \tag{30}$$

$$+ 167Y_{86} + 101Y_{87} + 156Y_{88} \tag{31}$$

$$+ 150Y_{89} + 129Y_{90} + 138Y_{91} \tag{32}$$

$$+ 48Y_{92} + 124Y_{93} + 167Y_{94} \tag{33}$$

$$+ 179Y_{95} + 135Y_{96} + 224Y_{97} \tag{34}$$

$$+ 66Y_{99} + 4X_0 + 8X_1 \tag{35}$$

$$+ 2X_2 + 7X_3 + 3X_4 \tag{36}$$

$$+ 2X_5 + 6X_6 + 7X_7 \tag{37}$$

$$+ 5X_8 + 3X_9 + 9X_{10} \tag{38}$$

$$+ 1X_{11} + 8X_{12} + 2X_{13} \tag{39}$$

$$+ 5X_{14} + 5X_{15} + 2X_{16} \tag{40}$$

$$+ 8X_{17} + 1X_{18} + 9X_{19} \tag{41}$$

$$+ 3X_{20} + 6X_{21} + 4X_{22} \tag{42}$$

$$+ 7X_{23} + 2X_{24} + 2X_{25} \tag{43}$$

$$+ 5X_{26} + 4X_{27} + 2X_{28} \tag{44}$$

$$+ 9X_{29} + 9X_{30} + 1X_{31} \tag{45}$$

$$+ 6X_{32} + 2X_{33} + 1X_{34} \tag{46}$$

$$+ 1X_{35} + 2X_{36} + 8X_{37} \tag{47}$$

$$+ 2X_{38} + 1X_{39} + 9X_{40} \tag{48}$$

$$+ 7X_{41} + 7X_{42} + 9X_{43} \tag{49}$$

$$+ 9X_{44} + 5X_{45} + 6X_{46} \tag{50}$$

$$+ 8X_{47} + 9X_{48} + 8X_{49} \tag{51}$$

$$+ 9X_{50} + 8X_{51} + 9X_{52} \tag{52}$$

$$+ 1X_{53} + 3X_{54} + 7X_{55} \tag{53}$$

$$+ 4X_{56} + 3X_{57} + 5X_{58} \tag{54}$$

$$+ 8X_{59} + 4X_{60} + 5X_{61} \tag{55}$$

$$+ 6X_{62} + 3X_{63} + 1X_{64} \tag{56}$$

$$+ 8X_{65} + 6X_{66} + 6X_{67} \tag{57}$$

$$+ 6X_{68} + 4X_{69} + 9X_{70} \tag{58}$$

$$+ 5X_{71} + 2X_{72} + 9X_{73} \tag{59}$$

$$+ 7X_{74} + 7X_{75} + 2X_{76} \tag{60}$$

$$+ 4X_{77} + 3X_{78} + 6X_{79} \tag{61}$$

$$+ 6X_{80} + 1X_{81} + 6X_{82} \tag{62}$$

$$+ 8X_{83} + 3X_{84} + 5X_{85} \tag{63}$$

$$+ 5X_{86} + 8X_{87} + 4X_{88} \tag{64}$$

$$+ 9X_{89} + 7X_{90} + 1X_{91} \tag{65}$$

$$+ 4X_{92} + 1X_{93} + 5X_{94} \tag{66}$$

$$+ 5X_{95} + 7X_{96} + 6X_{97} \tag{67}$$

$$+ 5X_{98} + 6X_{99}$$

3 约束条件

3.1 等式约束 (20 个)

$$X_0 + X_1 + X_2 + X_3 + X_4 + X_5 \tag{68}$$

$$+ X_6 + X_7 + X_8 + X_9 \quad = +7 \quad \text{(A0)} \tag{69}$$

$$X_{10} + X_{11} + X_{12} + X_{13} + X_{14} + X_{15} \tag{70}$$

$$+ X_{16} + X_{17} + X_{18} + X_{19} \quad = +4 \quad \text{(A1)} \tag{71}$$

$$X_{20} + X_{21} + X_{22} + X_{23} + X_{24} + X_{25} \tag{72}$$

$$+ X_{26} + X_{27} + X_{28} + X_{29} \quad = +7 \quad \text{(A2)} \tag{73}$$

$$X_{30} + X_{31} + X_{32} + X_{33} + X_{34} + X_{35} \tag{74}$$

$$+ X_{36} + X_{37} + X_{38} + X_{39} \quad = +9 \quad \text{(A3)} \tag{75}$$

$$X_{40} + X_{41} + X_{42} + X_{43} + X_{44} + X_{45} \tag{76}$$

$$+ X_{46} + X_{47} + X_{48} + X_{49} \quad = +12 \quad \text{(A4)} \tag{77}$$

$$X_{50} + X_{51} + X_{52} + X_{53} + X_{54} + X_{55} \tag{78}$$

$$+ X_{56} + X_{57} + X_{58} + X_{59} \quad = +11 \quad \text{(A5)} \tag{79}$$

$$X_{60} + X_{61} + X_{62} + X_{63} + X_{64} + X_{65} \tag{80}$$

$$+ X_{66} + X_{67} + X_{68} + X_{69} \quad = +13 \quad \text{(A6)} \tag{81}$$

$$X_{70} + X_{71} + X_{72} + X_{73} + X_{74} + X_{75} \tag{82}$$

$$+ X_{76} + X_{77} + X_{78} + X_{79} \quad = +16 \quad \text{(A7)} \tag{83}$$

$$X_{80} + X_{81} + X_{82} + X_{83} + X_{84} + X_{85} \tag{84}$$

$$+ X_{86} + X_{87} + X_{88} + X_{89} \quad = +6 \quad \text{(A8)} \tag{85}$$

$$X_{90} + X_{91} + X_{92} + X_{93} + X_{94} + X_{95} \tag{86}$$

$$+ X_{96} + X_{97} + X_{98} + X_{99} \quad = +15 \quad \text{(A9)} \tag{87}$$

$$X_0 + X_{10} + X_{20} + X_{30} + X_{40} + X_{50} \tag{88}$$

$$+ X_{60} + X_{70} + X_{80} + X_{90} \quad = +4 \quad \text{(B0)} \tag{89}$$

$$X_1 + X_{11} + X_{21} + X_{31} + X_{41} + X_{51} \tag{90}$$

$$+ X_{61} + X_{71} + X_{81} + X_{91} \quad = +8 \quad \text{(B1)} \tag{91}$$

$$X_2 + X_{12} + X_{22} + X_{32} + X_{42} + X_{52} \tag{92}$$

$$+ X_{62} + X_{72} + X_{82} + X_{92} \quad = +16 \quad \text{(B2)} \tag{93}$$

$$X_3 + X_{13} + X_{23} + X_{33} + X_{43} + X_{53} \tag{94}$$

$$+ X_{63} + X_{73} + X_{83} + X_{93} \quad = +15 \quad \text{(B3)} \tag{95}$$

$$X_4 + X_{14} + X_{24} + X_{34} + X_{44} + X_{54} \tag{96}$$

$$+ X_{64} + X_{74} + X_{84} + X_{94} \quad = +13 \quad \text{(B4)} \tag{97}$$

$$X_5 + X_{15} + X_{25} + X_{35} + X_{45} + X_{55} \tag{98}$$

$$+ X_{65} + X_{75} + X_{85} + X_{95} \quad = +2 \quad \text{(B5)} \tag{99}$$

$$X_6 + X_{16} + X_{26} + X_{36} + X_{46} + X_{56} \tag{100}$$

$$+ X_{66} + X_{76} + X_{86} + X_{96} = +3 \quad \text{(B6)} \tag{101}$$

$$X_7 + X_{17} + X_{27} + X_{37} + X_{47} + X_{57} \tag{102}$$

$$+ X_{67} + X_{77} + X_{87} + X_{97} = +7 \quad \text{(B7)} \tag{103}$$

$$X_8 + X_{18} + X_{28} + X_{38} + X_{48} + X_{58} \tag{104}$$

$$+ X_{68} + X_{78} + X_{88} + X_{98} = +15 \quad \text{(B8)} \tag{105}$$

$$X_9 + X_{19} + X_{29} + X_{39} + X_{49} + X_{59} \tag{106}$$

$$+ X_{69} + X_{79} + X_{89} + X_{99} = +17 \quad \text{(B9)} \tag{107}$$

(108)

3.2 不等式约束 (100 个)

$$X_0 - 4Y_0 \leq +0 \quad \text{(G0)} \tag{109}$$

$$X_1 - 7Y_1 \leq +0 \quad \text{(G1)} \tag{110}$$

$$X_2 - 7Y_2 \leq +0 \quad \text{(G2)} \tag{111}$$

$$X_3 - 7Y_3 \leq +0 \quad \text{(G3)} \tag{112}$$

$$X_4 - 7Y_4 \leq +0 \quad \text{(G4)} \tag{113}$$

$$X_5 - 2Y_5 \leq +0 \quad \text{(G5)} \tag{114}$$

$$X_6 - 3Y_6 \leq +0 \quad \text{(G6)} \tag{115}$$

$$X_7 - 7Y_7 \leq +0 \quad \text{(G7)} \tag{116}$$

$$X_8 - 7Y_8 \leq +0 \quad \text{(G8)} \tag{117}$$

$$X_9 - 7Y_9 \leq +0 \quad \text{(G9)} \tag{118}$$

$$X_{10} - 4Y_{10} \leq +0 \quad \text{(G10)} \tag{119}$$

$$X_{11} - 4Y_{11} \leq +0 \quad \text{(G11)} \tag{120}$$

$$X_{12} - 4Y_{12} \leq +0 \quad \text{(G12)} \tag{121}$$

$$X_{13} - 4Y_{13} \leq +0 \quad \text{(G13)} \tag{122}$$

$$X_{14} - 4Y_{14} \leq +0 \quad \text{(G14)} \tag{123}$$

$$X_{15} - 2Y_{15} \leq +0 \quad \text{(G15)} \tag{124}$$

$$X_{16} - 3Y_{16} \leq +0 \quad \text{(G16)} \tag{125}$$

$$X_{17} - 4Y_{17} \leq +0 \quad \text{(G17)} \tag{126}$$

$$X_{18} - 4Y_{18} \leq +0 \quad \text{(G18)} \tag{127}$$

$$X_{19} - 4Y_{19} \leq +0 \quad \text{(G19)} \tag{128}$$

$$X_{20} - 4Y_{20} \leq +0 \quad \text{(G20)} \tag{129}$$

$$X_{21} - 7Y_{21} \leq +0 \quad \text{(G21)} \tag{130}$$

$$X_{22} - 7Y_{22} \leq +0 \quad \text{(G22)} \tag{131}$$

$$X_{23} - 7Y_{23} \leq +0 \quad \text{(G23)} \tag{132}$$

$$X_{24} - 7Y_{24} \leq +0 \quad \text{(G24)} \tag{133}$$

$$X_{25} - 2Y_{25} \leq +0 \quad \text{(G25)} \tag{134}$$

$$X_{26} - 3Y_{26} \leq +0 \quad \text{(G26)} \tag{135}$$

$$X_{27} - 7Y_{27} \leq +0 \quad \text{(G27)} \tag{136}$$

$$X_{28} - 7Y_{28} \leq +0 \quad \text{(G28)} \tag{137}$$

$$X_{29} - 7Y_{29} \leq +0 \quad \text{(G29)} \tag{138}$$

$$X_{30} - 4Y_{30} \leq +0 \quad \text{(G30)} \tag{139}$$

$$X_{31} - 8Y_{31} \leq +0 \quad \text{(G31)} \quad (140)$$

$$X_{32} - 9Y_{32} \leq +0 \quad \text{(G32)} \quad (141)$$

$$X_{33} - 9Y_{33} \leq +0 \quad \text{(G33)} \quad (142)$$

$$X_{34} - 9Y_{34} \leq +0 \quad \text{(G34)} \quad (143)$$

$$X_{35} - 2Y_{35} \leq +0 \quad \text{(G35)} \quad (144)$$

$$X_{36} - 3Y_{36} \leq +0 \quad \text{(G36)} \quad (145)$$

$$X_{37} - 7Y_{37} \leq +0 \quad \text{(G37)} \quad (146)$$

$$X_{38} - 9Y_{38} \leq +0 \quad \text{(G38)} \quad (147)$$

$$X_{39} - 9Y_{39} \leq +0 \quad \text{(G39)} \quad (148)$$

$$X_{40} - 4Y_{40} \leq +0 \quad \text{(G40)} \quad (149)$$

$$X_{41} - 8Y_{41} \leq +0 \quad \text{(G41)} \quad (150)$$

$$X_{42} - 12Y_{42} \leq +0 \quad \text{(G42)} \quad (151)$$

$$X_{43} - 12Y_{43} \leq +0 \quad \text{(G43)} \quad (152)$$

$$X_{44} - 12Y_{44} \leq +0 \quad \text{(G44)} \quad (153)$$

$$X_{45} - 2Y_{45} \leq +0 \quad \text{(G45)} \quad (154)$$

$$X_{46} - 3Y_{46} \leq +0 \quad \text{(G46)} \quad (155)$$

$$X_{47} - 7Y_{47} \leq +0 \quad \text{(G47)} \quad (156)$$

$$X_{48} - 12Y_{48} \leq +0 \quad \text{(G48)} \quad (157)$$

$$X_{49} - 12Y_{49} \leq +0 \quad \text{(G49)} \quad (158)$$

$$X_{50} - 4Y_{50} \leq +0 \quad \text{(G50)} \quad (159)$$

$$X_{51} - 8Y_{51} \leq +0 \quad \text{(G51)} \quad (160)$$

$$X_{52} - 11Y_{52} \leq +0 \quad \text{(G52)} \quad (161)$$

$$X_{53} - 11Y_{53} \leq +0 \quad \text{(G53)} \quad (162)$$

$$X_{54} - 11Y_{54} \leq +0 \quad \text{(G54)} \quad (163)$$

$$X_{55} - 2Y_{55} \leq +0 \quad \text{(G55)} \quad (164)$$

$$X_{56} - 3Y_{56} \leq +0 \quad \text{(G56)} \quad (165)$$

$$X_{57} - 7Y_{57} \leq +0 \quad \text{(G57)} \quad (166)$$

$$X_{58} - 11Y_{58} \leq +0 \quad \text{(G58)} \quad (167)$$

$$X_{59} - 11Y_{59} \leq +0 \quad \text{(G59)} \quad (168)$$

$$X_{60} - 4Y_{60} \leq +0 \quad \text{(G60)} \quad (169)$$

$$X_{61} - 8Y_{61} \leq +0 \quad \text{(G61)} \quad (170)$$

$$X_{62} - 13Y_{62} \leq +0 \quad \text{(G62)} \quad (171)$$

$$X_{63} - 13Y_{63} \leq +0 \quad \text{(G63)} \quad (172)$$

$$X_{64} - 13Y_{64} \leq +0 \quad \text{(G64)} \quad (173)$$

$$X_{65} - 2Y_{65} \leq +0 \quad \text{(G65)} \quad (174)$$

$$X_{66} - 3Y_{66} \leq +0 \quad \text{(G66)} \quad (175)$$

$$X_{67} - 7Y_{67} \leq +0 \quad \text{(G67)} \quad (176)$$

$$X_{68} - 13Y_{68} \leq +0 \quad \text{(G68)} \quad (177)$$

$$X_{69} - 13Y_{69} \leq +0 \quad \text{(G69)} \quad (178)$$

$$X_{70} - 4Y_{70} \leq +0 \quad \text{(G70)} \quad (179)$$

$$X_{71} - 8Y_{71} \leq +0 \quad \text{(G71)} \quad (180)$$

$$X_{72} - 16Y_{72} \leq +0 \quad \text{(G72)} \quad (181)$$

$$X_{73} - 15Y_{73} \leq +0 \quad \text{(G73)} \tag{182}$$
$$X_{74} - 13Y_{74} \leq +0 \quad \text{(G74)} \tag{183}$$
$$X_{75} - 2Y_{75} \leq +0 \quad \text{(G75)} \tag{184}$$
$$X_{76} - 3Y_{76} \leq +0 \quad \text{(G76)} \tag{185}$$
$$X_{77} - 7Y_{77} \leq +0 \quad \text{(G77)} \tag{186}$$
$$X_{78} - 15Y_{78} \leq +0 \quad \text{(G78)} \tag{187}$$
$$X_{79} - 16Y_{79} \leq +0 \quad \text{(G79)} \tag{188}$$
$$X_{80} - 4Y_{80} \leq +0 \quad \text{(G80)} \tag{189}$$
$$X_{81} - 6Y_{81} \leq +0 \quad \text{(G81)} \tag{190}$$
$$X_{82} - 6Y_{82} \leq +0 \quad \text{(G82)} \tag{191}$$
$$X_{83} - 6Y_{83} \leq +0 \quad \text{(G83)} \tag{192}$$
$$X_{84} - 6Y_{84} \leq +0 \quad \text{(G84)} \tag{193}$$
$$X_{85} - 2Y_{85} \leq +0 \quad \text{(G85)} \tag{194}$$
$$X_{86} - 3Y_{86} \leq +0 \quad \text{(G86)} \tag{195}$$
$$X_{87} - 6Y_{87} \leq +0 \quad \text{(G87)} \tag{196}$$
$$X_{88} - 6Y_{88} \leq +0 \quad \text{(G88)} \tag{197}$$
$$X_{89} - 6Y_{89} \leq +0 \quad \text{(G89)} \tag{198}$$
$$X_{90} - 4Y_{90} \leq +0 \quad \text{(G90)} \tag{199}$$
$$X_{91} - 8Y_{91} \leq +0 \quad \text{(G91)} \tag{200}$$
$$X_{92} - 15Y_{92} \leq +0 \quad \text{(G92)} \tag{201}$$
$$X_{93} - 15Y_{93} \leq +0 \quad \text{(G93)} \tag{202}$$
$$X_{94} - 13Y_{94} \leq +0 \quad \text{(G94)} \tag{203}$$
$$X_{95} - 2Y_{95} \leq +0 \quad \text{(G95)} \tag{204}$$
$$X_{96} - 3Y_{96} \leq +0 \quad \text{(G96)} \tag{205}$$
$$X_{97} - 7Y_{97} \leq +0 \quad \text{(G97)} \tag{206}$$
$$X_{98} - 15Y_{98} \leq +0 \quad \text{(G98)} \tag{207}$$
$$X_{99} - 15Y_{99} \leq +0 \quad \text{(G99)} \tag{208}$$
$$\tag{209}$$

4 变量定义

4.1 二元变量 (100 个)

$$Y_i \in \{0, 1\}, \quad i \in \{0, 1, 2, \ldots, 99\} \tag{210}$$

二元变量示例 (显示前 50 个，共 100 个):

Y_{98}, 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 50 个二元变量

4.2 连续变量 (100 个)

所有连续变量均为非负实数:

$$X_j \geq 0, \quad j \in \{0, 1, 2, \ldots, 99\} \tag{211}$$

连续变量说明: 模型包含 100 个连续决策变量，所有变量的取值范围均为非负实数域。