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: `bal8x12.mps`
模型名: name
变量总数: 192
约束总数: 116
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: 96 个，系数范围 [10, 20]
X 变量: 96 个，系数范围 [0.17, 7.68]

完整目标函数:

$$\begin{aligned}
\min \quad Z = {} & 16Y_{94} + 11Y_0 + 16Y_1 && (2)\\
& + 18Y_2 + 17Y_3 + 10Y_4 && (3)\\
& + 20Y_5 + 17Y_6 + 13Y_7 && (4)\\
& + 15Y_8 + 12Y_9 + 14Y_{10} && (5)\\
& + 14Y_{11} + 14Y_{12} + 17Y_{13} && (6)\\
& + 17Y_{14} + 13Y_{15} + 15Y_{16} && (7)\\
& + 13Y_{17} + 16Y_{18} + 11Y_{19} && (8)\\
& + 20Y_{20} + 11Y_{21} + 15Y_{22} && (9)\\
& + 10Y_{23} + 12Y_{24} + 13Y_{25} && (10)\\
& + 20Y_{26} + 17Y_{27} + 13Y_{28} && (11)\\
& + 15Y_{29} + 16Y_{30} + 13Y_{31} && (12)\\
& + 12Y_{32} + 13Y_{33} + 10Y_{34} && (13)\\
& + 18Y_{35} + 16Y_{36} + 19Y_{37} && (14)\\
& + 16Y_{38} + 11Y_{39} + 15Y_{40} && (15)\\
& + 12Y_{41} + 18Y_{42} + 12Y_{43} && (16)\\
& + 18Y_{44} + 13Y_{45} + 13Y_{46} && (17)\\
& + 14Y_{47} + 19Y_{48} + 18Y_{49} && (18)\\
& + 15Y_{50} + 16Y_{51} + 12Y_{52} && (19)\\
& + 14Y_{53} + 20Y_{54} + 19Y_{55} && (20)\\
& + 11Y_{56} + 17Y_{57} + 16Y_{58} && (21)\\
& + 18Y_{59} + 13Y_{60} + 20Y_{61} && (22)\\
& + 20Y_{62} + 17Y_{63} + 15Y_{64} && (23)\\
& + 12Y_{65} + 14Y_{66} + 11Y_{67} && (24)\\
& + 12Y_{68} + 19Y_{69} + 15Y_{70} && (25)
\end{aligned}$$

$$+ 16Y_{71} + 11Y_{72} + 12Y_{73} \tag{26}$$

$$+ 15Y_{74} + 10Y_{75} + 17Y_{76} \tag{27}$$

$$+ 11Y_{77} + 11Y_{78} + 16Y_{79} \tag{28}$$

$$+ 10Y_{80} + 18Y_{81} + 17Y_{82} \tag{29}$$

$$+ 12Y_{83} + 17Y_{84} + 10Y_{85} \tag{30}$$

$$+ 20Y_{86} + 12Y_{87} + 17Y_{88} \tag{31}$$

$$+ 20Y_{89} + 16Y_{90} + 15Y_{91} \tag{32}$$

$$+ 10Y_{92} + 12Y_{93} + 18Y_{95} \tag{33}$$

$$+ 0.69X_0 + 0.64X_1 + 0.71X_2 \tag{34}$$

$$+ 0.79X_3 + 1.7X_4 + 2.83X_5 \tag{35}$$

$$+ 2.02X_6 + 5.64X_7 + 5.94X_8 \tag{36}$$

$$+ 5.94X_9 + 5.94X_{10} + 7.68X_{11} \tag{37}$$

$$+ 1.01X_{12} + 0.75X_{13} + 0.88X_{14} \tag{38}$$

$$+ 0.59X_{15} + 1.5X_{16} + 2.63X_{17} \tag{39}$$

$$+ 2.26X_{18} + 5.64X_{19} + 5.85X_{20} \tag{40}$$

$$+ 5.62X_{21} + 5.85X_{22} + 4.94X_{23} \tag{41}$$

$$+ 1.05X_{24} + 1.06X_{25} + 1.08X_{26} \tag{42}$$

$$+ 0.64X_{27} + 1.22X_{28} + 2.37X_{29} \tag{43}$$

$$+ 1.66X_{30} + 5.64X_{31} + 5.91X_{32} \tag{44}$$

$$+ 5.62X_{33} + 5.91X_{34} + 4.94X_{35} \tag{45}$$

$$+ 1.94X_{36} + 1.5X_{37} + 1.56X_{38} \tag{46}$$

$$+ 1.22X_{39} + 1.98X_{40} + 1.98X_{41} \tag{47}$$

$$+ 1.36X_{42} + 6.99X_{43} + 6.99X_{44} \tag{48}$$

$$+ 6.99X_{45} + 6.99X_{46} + 3.68X_{47} \tag{49}$$

$$+ 1.61X_{48} + 1.4X_{49} + 1.61X_{50} \tag{50}$$

$$+ 1.33X_{51} + 1.68X_{52} + 2.83X_{53} \tag{51}$$

$$+ 1.54X_{54} + 4.26X_{55} + 4.26X_{56} \tag{52}$$

$$+ 4.26X_{57} + 4.26X_{58} + 2.99X_{59} \tag{53}$$

$$+ 5.29X_{60} + 5.94X_{61} + 6.08X_{62} \tag{54}$$

$$+ 5.29X_{63} + 5.96X_{64} + 6.77X_{65} \tag{55}$$

$$+ 5.08X_{66} + 0.31X_{67} + 0.21X_{68} \tag{56}$$

$$+ 0.17X_{69} + 0.31X_{70} + 1.53X_{71} \tag{57}$$

$$+ 5.29X_{72} + 5.94X_{73} + 6.08X_{74} \tag{58}$$

$$+ 5.29X_{75} + 5.96X_{76} + 6.77X_{77} \tag{59}$$

$$+ 5.08X_{78} + 0.55X_{79} + 0.35X_{80} \tag{60}$$

$$+ 0.4X_{81} + 0.19X_{82} + 1.53X_{83} \tag{61}$$

$$+ 5.29X_{84} + 6.08X_{85} + 6.08X_{86} \tag{62}$$

$$+ 5.29X_{87} + 5.96X_{88} + 6.45X_{89} \tag{63}$$

$$+ 5.08X_{90} + 2.43X_{91} + 2.3X_{92} \tag{64}$$

$$+ 2.33X_{93} + 1.81X_{94} + 2.5X_{95}$$

3 约束条件

3.1 等式约束 (20 个)

$$X_0 + X_1 + X_2 + X_3 + X_4 + X_5 \tag{65}$$

$$+ X_6 + X_7 + X_8 + X_9 + X_{10} + X_{11} = +15 \quad \text{(A0)} \tag{66}$$

$$X_{12} + X_{13} + X_{14} + X_{15} + X_{16} + X_{17} \tag{67}$$

$$+ X_{18} + X_{19} + X_{20} + X_{21} + X_{22} + X_{23} = +20 \quad \text{(A1)} \tag{68}$$

$$X_{24} + X_{25} + X_{26} + X_{27} + X_{28} + X_{29} \tag{69}$$

$$+ X_{30} + X_{31} + X_{32} + X_{33} + X_{34} + X_{35} = +45 \quad \text{(A2)} \tag{70}$$

$$X_{36} + X_{37} + X_{38} + X_{39} + X_{40} + X_{41} \tag{71}$$

$$+ X_{42} + X_{43} + X_{44} + X_{45} + X_{46} + X_{47} = +35 \quad \text{(A3)} \tag{72}$$

$$X_{48} + X_{49} + X_{50} + X_{51} + X_{52} + X_{53} \tag{73}$$

$$+ X_{54} + X_{55} + X_{56} + X_{57} + X_{58} + X_{59} = +25 \quad \text{(A4)} \tag{74}$$

$$X_{60} + X_{61} + X_{62} + X_{63} + X_{64} + X_{65} \tag{75}$$

$$+ X_{66} + X_{67} + X_{68} + X_{69} + X_{70} + X_{71} = +35 \quad \text{(A5)} \tag{76}$$

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

$$+ X_{78} + X_{79} + X_{80} + X_{81} + X_{82} + X_{83} = +10 \quad \text{(A6)} \tag{78}$$

$$X_{84} + X_{85} + X_{86} + X_{87} + X_{88} + X_{89} \tag{79}$$

$$+ X_{90} + X_{91} + X_{92} + X_{93} + X_{94} + X_{95} = +25 \quad \text{(A7)} \tag{80}$$

$$X_0 + X_{12} + X_{24} + X_{36} + X_{48} + X_{60} \tag{81}$$

$$+ X_{72} + X_{84} = +20 \quad \text{(B0)} \tag{82}$$

$$X_1 + X_{13} + X_{25} + X_{37} + X_{49} + X_{61} \tag{83}$$

$$+ X_{73} + X_{85} = +15 \quad \text{(B1)} \tag{84}$$

$$X_2 + X_{14} + X_{26} + X_{38} + X_{50} + X_{62} \tag{85}$$

$$+ X_{74} + X_{86} = +20 \quad \text{(B2)} \tag{86}$$

$$X_3 + X_{15} + X_{27} + X_{39} + X_{51} + X_{63} \tag{87}$$

$$+ X_{75} + X_{87} = +15 \quad \text{(B3)} \tag{88}$$

$$X_4 + X_{16} + X_{28} + X_{40} + X_{52} + X_{64} \tag{89}$$

$$+ X_{76} + X_{88} = +5 \quad \text{(B4)} \tag{90}$$

$$X_5 + X_{17} + X_{29} + X_{41} + X_{53} + X_{65} \tag{91}$$

$$+ X_{77} + X_{89} = +20 \quad \text{(B5)} \tag{92}$$

$$X_6 + X_{18} + X_{30} + X_{42} + X_{54} + X_{66} \tag{93}$$

$$+ X_{78} + X_{90} = +30 \quad \text{(B6)} \tag{94}$$

$$X_7 + X_{19} + X_{31} + X_{43} + X_{55} + X_{67} \tag{95}$$

$$+ X_{79} + X_{91} = +10 \quad \text{(B7)} \tag{96}$$

$$X_8 + X_{20} + X_{32} + X_{44} + X_{56} + X_{68} \tag{97}$$

$$+ X_{80} + X_{92} = +35 \quad \text{(B8)} \tag{98}$$

$$X_9 + X_{21} + X_{33} + X_{45} + X_{57} + X_{69} \tag{99}$$

$$+ X_{81} + X_{93} = +25 \quad \text{(B9)} \tag{100}$$

$$X_{10} + X_{22} + X_{34} + X_{46} + X_{58} + X_{70} \tag{101}$$

$$+ X_{82} + X_{94} = +10 \quad \text{(B10)} \tag{102}$$

$$X_{11} + X_{23} + X_{35} + X_{47} + X_{59} + X_{71} \tag{103}$$

$$+ X_{83} + X_{95} = +5 \quad \text{(B11)} \tag{104}$$

$$\tag{105}$$

3.2 不等式约束 (96 个)

$$X_0 - 15Y_0 \leq +0 \quad \text{(G0)} \tag{106}$$

$$X_1 - 15Y_1 \leq +0 \quad \text{(G1)} \tag{107}$$

$$X_2 - 15Y_2 \leq +0 \quad \text{(G2)} \tag{108}$$

$$X_3 - 15Y_3 \leq +0 \quad \text{(G3)} \tag{109}$$

$$X_4 - 5Y_4 \leq +0 \quad \text{(G4)} \tag{110}$$

$$X_5 - 15Y_5 \leq +0 \quad \text{(G5)} \tag{111}$$

$$X_6 - 15Y_6 \leq +0 \quad \text{(G6)} \tag{112}$$

$$X_7 - 10Y_7 \leq +0 \quad \text{(G7)} \tag{113}$$

$$X_8 - 15Y_8 \leq +0 \quad \text{(G8)} \tag{114}$$

$$X_9 - 15Y_9 \leq +0 \quad \text{(G9)} \tag{115}$$

$$X_{10} - 10Y_{10} \leq +0 \quad \text{(G10)} \tag{116}$$

$$X_{11} - 5Y_{11} \leq +0 \quad \text{(G11)} \tag{117}$$

$$X_{12} - 20Y_{12} \leq +0 \quad \text{(G12)} \tag{118}$$

$$X_{13} - 15Y_{13} \leq +0 \quad \text{(G13)} \tag{119}$$

$$X_{14} - 20Y_{14} \leq +0 \quad \text{(G14)} \tag{120}$$

$$X_{15} - 15Y_{15} \leq +0 \quad \text{(G15)} \tag{121}$$

$$X_{16} - 5Y_{16} \leq +0 \quad \text{(G16)} \tag{122}$$

$$X_{17} - 20Y_{17} \leq +0 \quad \text{(G17)} \tag{123}$$

$$X_{18} - 20Y_{18} \leq +0 \quad \text{(G18)} \tag{124}$$

$$X_{19} - 10Y_{19} \leq +0 \quad \text{(G19)} \tag{125}$$

$$X_{20} - 20Y_{20} \leq +0 \quad \text{(G20)} \tag{126}$$

$$X_{21} - 20Y_{21} \leq +0 \quad \text{(G21)} \tag{127}$$

$$X_{22} - 10Y_{22} \leq +0 \quad \text{(G22)} \tag{128}$$

$$X_{23} - 5Y_{23} \leq +0 \quad \text{(G23)} \tag{129}$$

$$X_{24} - 20Y_{24} \leq +0 \quad \text{(G24)} \tag{130}$$

$$X_{25} - 15Y_{25} \leq +0 \quad \text{(G25)} \tag{131}$$

$$X_{26} - 20Y_{26} \leq +0 \quad \text{(G26)} \tag{132}$$

$$X_{27} - 15Y_{27} \leq +0 \quad \text{(G27)} \tag{133}$$

$$X_{28} - 5Y_{28} \leq +0 \quad \text{(G28)} \tag{134}$$

$$X_{29} - 20Y_{29} \leq +0 \quad \text{(G29)} \tag{135}$$

$$X_{30} - 30Y_{30} \leq +0 \quad \text{(G30)} \tag{136}$$

$$X_{31} - 10Y_{31} \leq +0 \quad \text{(G31)} \tag{137}$$

$$X_{32} - 35Y_{32} \leq +0 \quad \text{(G32)} \tag{138}$$

$$X_{33} - 25Y_{33} \leq +0 \quad \text{(G33)} \tag{139}$$

$$X_{34} - 10Y_{34} \leq +0 \quad \text{(G34)} \quad (140)$$

$$X_{35} - 5Y_{35} \leq +0 \quad \text{(G35)} \quad (141)$$

$$X_{36} - 20Y_{36} \leq +0 \quad \text{(G36)} \quad (142)$$

$$X_{37} - 15Y_{37} \leq +0 \quad \text{(G37)} \quad (143)$$

$$X_{38} - 20Y_{38} \leq +0 \quad \text{(G38)} \quad (144)$$

$$X_{39} - 15Y_{39} \leq +0 \quad \text{(G39)} \quad (145)$$

$$X_{40} - 5Y_{40} \leq +0 \quad \text{(G40)} \quad (146)$$

$$X_{41} - 20Y_{41} \leq +0 \quad \text{(G41)} \quad (147)$$

$$X_{42} - 30Y_{42} \leq +0 \quad \text{(G42)} \quad (148)$$

$$X_{43} - 10Y_{43} \leq +0 \quad \text{(G43)} \quad (149)$$

$$X_{44} - 35Y_{44} \leq +0 \quad \text{(G44)} \quad (150)$$

$$X_{45} - 25Y_{45} \leq +0 \quad \text{(G45)} \quad (151)$$

$$X_{46} - 10Y_{46} \leq +0 \quad \text{(G46)} \quad (152)$$

$$X_{47} - 5Y_{47} \leq +0 \quad \text{(G47)} \quad (153)$$

$$X_{48} - 20Y_{48} \leq +0 \quad \text{(G48)} \quad (154)$$

$$X_{49} - 15Y_{49} \leq +0 \quad \text{(G49)} \quad (155)$$

$$X_{50} - 20Y_{50} \leq +0 \quad \text{(G50)} \quad (156)$$

$$X_{51} - 15Y_{51} \leq +0 \quad \text{(G51)} \quad (157)$$

$$X_{52} - 5Y_{52} \leq +0 \quad \text{(G52)} \quad (158)$$

$$X_{53} - 20Y_{53} \leq +0 \quad \text{(G53)} \quad (159)$$

$$X_{54} - 25Y_{54} \leq +0 \quad \text{(G54)} \quad (160)$$

$$X_{55} - 10Y_{55} \leq +0 \quad \text{(G55)} \quad (161)$$

$$X_{56} - 25Y_{56} \leq +0 \quad \text{(G56)} \quad (162)$$

$$X_{57} - 25Y_{57} \leq +0 \quad \text{(G57)} \quad (163)$$

$$X_{58} - 10Y_{58} \leq +0 \quad \text{(G58)} \quad (164)$$

$$X_{59} - 5Y_{59} \leq +0 \quad \text{(G59)} \quad (165)$$

$$X_{60} - 20Y_{60} \leq +0 \quad \text{(G60)} \quad (166)$$

$$X_{61} - 15Y_{61} \leq +0 \quad \text{(G61)} \quad (167)$$

$$X_{62} - 20Y_{62} \leq +0 \quad \text{(G62)} \quad (168)$$

$$X_{63} - 15Y_{63} \leq +0 \quad \text{(G63)} \quad (169)$$

$$X_{64} - 5Y_{64} \leq +0 \quad \text{(G64)} \quad (170)$$

$$X_{65} - 20Y_{65} \leq +0 \quad \text{(G65)} \quad (171)$$

$$X_{66} - 30Y_{66} \leq +0 \quad \text{(G66)} \quad (172)$$

$$X_{67} - 10Y_{67} \leq +0 \quad \text{(G67)} \quad (173)$$

$$X_{68} - 35Y_{68} \leq +0 \quad \text{(G68)} \quad (174)$$

$$X_{69} - 25Y_{69} \leq +0 \quad \text{(G69)} \quad (175)$$

$$X_{70} - 10Y_{70} \leq +0 \quad \text{(G70)} \quad (176)$$

$$X_{71} - 5Y_{71} \leq +0 \quad \text{(G71)} \quad (177)$$

$$X_{72} - 10Y_{72} \leq +0 \quad \text{(G72)} \quad (178)$$

$$X_{73} - 10Y_{73} \leq +0 \quad \text{(G73)} \quad (179)$$

$$X_{74} - 10Y_{74} \leq +0 \quad \text{(G74)} \quad (180)$$

$$X_{75} - 10Y_{75} \leq +0 \quad \text{(G75)} \quad (181)$$

$$X_{76} - 5Y_{76} \leq +0 \quad \text{(G76)} \tag{182}$$
$$X_{77} - 10Y_{77} \leq +0 \quad \text{(G77)} \tag{183}$$
$$X_{78} - 10Y_{78} \leq +0 \quad \text{(G78)} \tag{184}$$
$$X_{79} - 10Y_{79} \leq +0 \quad \text{(G79)} \tag{185}$$
$$X_{80} - 10Y_{80} \leq +0 \quad \text{(G80)} \tag{186}$$
$$X_{81} - 10Y_{81} \leq +0 \quad \text{(G81)} \tag{187}$$
$$X_{82} - 10Y_{82} \leq +0 \quad \text{(G82)} \tag{188}$$
$$X_{83} - 5Y_{83} \leq +0 \quad \text{(G83)} \tag{189}$$
$$X_{84} - 20Y_{84} \leq +0 \quad \text{(G84)} \tag{190}$$
$$X_{85} - 15Y_{85} \leq +0 \quad \text{(G85)} \tag{191}$$
$$X_{86} - 20Y_{86} \leq +0 \quad \text{(G86)} \tag{192}$$
$$X_{87} - 15Y_{87} \leq +0 \quad \text{(G87)} \tag{193}$$
$$X_{88} - 5Y_{88} \leq +0 \quad \text{(G88)} \tag{194}$$
$$X_{89} - 20Y_{89} \leq +0 \quad \text{(G89)} \tag{195}$$
$$X_{90} - 25Y_{90} \leq +0 \quad \text{(G90)} \tag{196}$$
$$X_{91} - 10Y_{91} \leq +0 \quad \text{(G91)} \tag{197}$$
$$X_{92} - 25Y_{92} \leq +0 \quad \text{(G92)} \tag{198}$$
$$X_{93} - 25Y_{93} \leq +0 \quad \text{(G93)} \tag{199}$$
$$X_{94} - 10Y_{94} \leq +0 \quad \text{(G94)} \tag{200}$$
$$X_{95} - 5Y_{95} \leq +0 \quad \text{(G95)} \tag{201}$$
$$\tag{202}$$

4 变量定义

4.1 二元变量 (96 个)

$$Y_i \in \{0, 1\}, \quad i \in \{0, 1, 2, \ldots, 95\} \tag{203}$$

二元变量示例 (显示前 50 个，共 96 个):

Y_{94}, 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 46 个二元变量

4.2 连续变量 (96 个)

所有连续变量均为非负实数:

$$X_j \geq 0, \quad j \in \{0, 1, 2, \ldots, 95\} \tag{204}$$

连续变量说明: 模型包含 96 个连续决策变量，所有变量的取值范围均为非负实数域。