

# 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: ran10x12.mps

模型名: name

变量总数: 240

约束总数: 142

优化方向: Minimize

## 2 目标函数

目标函数摘要:

$$\min \quad Z = \sum_i c_i Y_i + \sum_j d_j X_j \quad (1)$$

Y 变量: 120 个, 系数范围 [83, 298]

X 变量: 120 个, 系数范围 [1, 10]

完整目标函数:

$$\min \quad Z = 136Y_{118} + 192Y_0 + 144Y_1 \quad (2)$$

$$+ 281Y_2 + 227Y_3 + 275Y_4 \quad (3)$$

$$+ 145Y_5 + 257Y_6 + 83Y_7 \quad (4)$$

$$+ 179Y_8 + 136Y_9 + 223Y_{10} \quad (5)$$

$$+ 136Y_{11} + 241Y_{12} + 230Y_{13} \quad (6)$$

$$+ 149Y_{14} + 287Y_{15} + 265Y_{16} \quad (7)$$

$$+ 239Y_{17} + 161Y_{18} + 182Y_{19} \quad (8)$$

$$+ 274Y_{20} + 175Y_{21} + 161Y_{22} \quad (9)$$

$$+ 129Y_{23} + 84Y_{24} + 85Y_{25} \quad (10)$$

$$+ 92Y_{26} + 154Y_{27} + 230Y_{28} \quad (11)$$

$$+ 100Y_{29} + 292Y_{30} + 154Y_{31} \quad (12)$$

$$+ 288Y_{32} + 142Y_{33} + 141Y_{34} \quad (13)$$

$$+ 218Y_{35} + 298Y_{36} + 293Y_{37} \quad (14)$$

$$+ 243Y_{38} + 298Y_{39} + 115Y_{40} \quad (15)$$

$$+ 233Y_{41} + 285Y_{42} + 277Y_{43} \quad (16)$$

$$+ 204Y_{44} + 274Y_{45} + 171Y_{46} \quad (17)$$

$$+ 129Y_{47} + 240Y_{48} + 264Y_{49} \quad (18)$$

$$+ 83Y_{50} + 277Y_{51} + 282Y_{52} \quad (19)$$

$$+ 113Y_{53} + 155Y_{54} + 154Y_{55} \quad (20)$$

$$+ 263Y_{56} + 204Y_{57} + 262Y_{58} \quad (21)$$

$$+ 218Y_{59} + 114Y_{60} + 298Y_{61} \quad (22)$$

$$+ 103Y_{62} + 92Y_{63} + 112Y_{64} \quad (23)$$

$$+ 92Y_{65} + 240Y_{66} + 263Y_{67} \quad (24)$$

$$+ 228Y_{68} + 116Y_{69} + 121Y_{70} \quad (25)$$

$$+ 274Y_{71} + 201Y_{72} + 158Y_{73} \quad (26)$$

$$+ 233Y_{74} + 152Y_{75} + 289Y_{76} \quad (27)$$

$$+ 193Y_{77} + 150Y_{78} + 267Y_{79} \quad (28)$$

$$+ 105Y_{80} + 87Y_{81} + 243Y_{82} \quad (29)$$

$$+ 149Y_{83} + 183Y_{84} + 243Y_{85} \quad (30)$$

$$+ 139Y_{86} + 156Y_{87} + 264Y_{88} \quad (31)$$

$$+ 257Y_{89} + 97Y_{90} + 85Y_{91} \quad (32)$$

$$+ 227Y_{92} + 284Y_{93} + 176Y_{94} \quad (33)$$

$$+ 213Y_{95} + 192Y_{96} + 155Y_{97} \quad (34)$$

$$+ 182Y_{98} + 152Y_{99} + 277Y_{100} \quad (35)$$

$$+ 175Y_{101} + 124Y_{102} + 225Y_{103} \quad (36)$$

$$+ 210Y_{104} + 117Y_{105} + 175Y_{106} \quad (37)$$

$$+ 96Y_{107} + 108Y_{108} + 145Y_{109} \quad (38)$$

$$+ 192Y_{110} + 233Y_{111} + 221Y_{112} \quad (39)$$

$$+ 162Y_{113} + 228Y_{114} + 223Y_{115} \quad (40)$$

$$+ 107Y_{116} + 262Y_{117} + 137Y_{119} \quad (41)$$

$$+ 7X_0 + 10X_1 + 3X_2 \quad (42)$$

$$+ 2X_3 + 9X_4 + 6X_5 \quad (43)$$

$$+ 2X_6 + 3X_7 + 3X_8 \quad (44)$$

$$+ 4X_9 + 8X_{10} + 4X_{11} \quad (45)$$

$$+ 1X_{12} + 4X_{13} + 4X_{14} \quad (46)$$

$$+ 10X_{15} + 4X_{16} + 2X_{17} \quad (47)$$

$$+ 8X_{18} + 1X_{19} + 8X_{20} \quad (48)$$

$$+ 7X_{21} + 7X_{22} + 7X_{23} \quad (49)$$

$$+ 4X_{24} + 4X_{25} + 10X_{26} \quad (50)$$

$$+ 2X_{27} + 4X_{28} + 7X_{29} \quad (51)$$

$$+ 6X_{30} + 2X_{31} + 9X_{32} \quad (52)$$

$$+ 8X_{33} + 3X_{34} + 8X_{35} \quad (53)$$

$$+ 1X_{36} + 5X_{37} + 4X_{38} \quad (54)$$

$$+ 1X_{39} + 8X_{40} + 6X_{41} \quad (55)$$

$$+ 2X_{42} + 6X_{43} + 6X_{44} \quad (56)$$

$$+ 8X_{45} + 9X_{46} + 7X_{47} \quad (57)$$

$$+ 1X_{48} + 7X_{49} + 3X_{50} \quad (58)$$

$$+ 7X_{51} + 4X_{52} + 3X_{53} \quad (59)$$

$$+ 2X_{54} + 3X_{55} + 6X_{56} \quad (60)$$

$$+ 7X_{57} + 7X_{58} + 7X_{59} \quad (61)$$

$$+ 7X_{60} + 2X_{61} + 7X_{62} \quad (62)$$

$$+ 10X_{63} + 5X_{64} + 9X_{65} \quad (63)$$

$$+ 2X_{66} + 6X_{67} + 5X_{68} \quad (64)$$

$$+ 6X_{69} + 2X_{70} + 10X_{71} \quad (65)$$

$$+ 4X_{72} + 10X_{73} + 6X_{74} \quad (66)$$

$$+ 1X_{75} + 8X_{76} + 8X_{77} \quad (67)$$

$$+ 5X_{78} + 5X_{79} + 8X_{80} \quad (68)$$

$$+ 6X_{81} + 5X_{82} + 3X_{83} \quad (69)$$

$$+ 10X_{84} + 4X_{85} + 1X_{86} \quad (70)$$

$$+ 9X_{87} + 7X_{88} + 2X_{89} \quad (71)$$

$$+ 2X_{90} + 5X_{91} + 2X_{92} \quad (72)$$

$$+ 3X_{93} + 5X_{94} + 3X_{95} \quad (73)$$

$$+ 7X_{96} + 2X_{97} + 1X_{98} \quad (74)$$

$$+ 1X_{99} + 8X_{100} + 6X_{101} \quad (75)$$

$$+ 5X_{102} + 2X_{103} + 10X_{104} \quad (76)$$

$$+ 6X_{105} + 6X_{106} + 2X_{107} \quad (77)$$

$$+ 3X_{108} + 10X_{109} + 7X_{110} \quad (78)$$

$$+ 6X_{111} + 10X_{112} + 7X_{113} \quad (79)$$

$$+ 5X_{114} + 8X_{115} + 2X_{116} \quad (80)$$

$$+ 6X_{117} + 4X_{118} + 5X_{119}$$

### 3 约束条件

#### 3.1 等式约束 (22 个)

$$X_0 + X_1 + X_2 + X_3 + X_4 + X_5 \quad (81)$$

$$+ X_6 + X_7 + X_8 + X_9 + X_{10} + X_{11} = +14 \quad (\text{A0}) \quad (82)$$

$$X_{12} + X_{13} + X_{14} + X_{15} + X_{16} + X_{17} \quad (83)$$

$$+ X_{18} + X_{19} + X_{20} + X_{21} + X_{22} + X_{23} = +21 \quad (\text{A1}) \quad (84)$$

$$X_{24} + X_{25} + X_{26} + X_{27} + X_{28} + X_{29} \quad (85)$$

$$+ X_{30} + X_{31} + X_{32} + X_{33} + X_{34} + X_{35} = +30 \quad (\text{A2}) \quad (86)$$

$$X_{36} + X_{37} + X_{38} + X_{39} + X_{40} + X_{41} \quad (87)$$

$$+ X_{42} + X_{43} + X_{44} + X_{45} + X_{46} + X_{47} = +17 \quad (\text{A3}) \quad (88)$$

$$X_{48} + X_{49} + X_{50} + X_{51} + X_{52} + X_{53} \quad (89)$$

$$+ X_{54} + X_{55} + X_{56} + X_{57} + X_{58} + X_{59} = +8 \quad (\text{A4}) \quad (90)$$

$$X_{60} + X_{61} + X_{62} + X_{63} + X_{64} + X_{65} \quad (91)$$

$$+ X_{66} + X_{67} + X_{68} + X_{69} + X_{70} + X_{71} = +10 \quad (\text{A5}) \quad (92)$$

$$X_{72} + X_{73} + X_{74} + X_{75} + X_{76} + X_{77} \quad (93)$$

$$+ X_{78} + X_{79} + X_{80} + X_{81} + X_{82} + X_{83} = +28 \quad (\text{A6}) \quad (94)$$

$$X_{84} + X_{85} + X_{86} + X_{87} + X_{88} + X_{89} \quad (95)$$

$$+ X_{90} + X_{91} + X_{92} + X_{93} + X_{94} + X_{95} = +5 \quad (\text{A7}) \quad (96)$$

$$X_{96} + X_{97} + X_{98} + X_{99} + X_{100} + X_{101} \quad (97)$$

$$+ X_{102} + X_{103} + X_{104} + X_{105} + X_{106} + X_{107} = +5 \quad (\text{A8}) \quad (98)$$

$$X_{108} + X_{109} + X_{110} + X_{111} + X_{112} + X_{113} \quad (99)$$

$$\begin{aligned}
& + X_{114} + X_{115} + X_{116} + X_{117} + X_{118} + X_{119} = +12 \quad (\text{A9}) \quad (100) \\
X_0 + X_{12} + X_{24} + X_{36} + X_{48} + X_{60} & \quad (101) \\
& + X_{72} + X_{84} + X_{96} + X_{108} = +2 \quad (\text{B0}) \quad (102) \\
X_1 + X_{13} + X_{25} + X_{37} + X_{49} + X_{61} & \quad (103) \\
& + X_{73} + X_{85} + X_{97} + X_{109} = +7 \quad (\text{B1}) \quad (104) \\
X_2 + X_{14} + X_{26} + X_{38} + X_{50} + X_{62} & \quad (105) \\
& + X_{74} + X_{86} + X_{98} + X_{110} = +13 \quad (\text{B2}) \quad (106) \\
X_3 + X_{15} + X_{27} + X_{39} + X_{51} + X_{63} & \quad (107) \\
& + X_{75} + X_{87} + X_{99} + X_{111} = +3 \quad (\text{B3}) \quad (108) \\
X_4 + X_{16} + X_{28} + X_{40} + X_{52} + X_{64} & \quad (109) \\
& + X_{76} + X_{88} + X_{100} + X_{112} = +28 \quad (\text{B4}) \quad (110) \\
X_5 + X_{17} + X_{29} + X_{41} + X_{53} + X_{65} & \quad (111) \\
& + X_{77} + X_{89} + X_{101} + X_{113} = +16 \quad (\text{B5}) \quad (112) \\
X_6 + X_{18} + X_{30} + X_{42} + X_{54} + X_{66} & \quad (113) \\
& + X_{78} + X_{90} + X_{102} + X_{114} = +2 \quad (\text{B6}) \quad (114) \\
X_7 + X_{19} + X_{31} + X_{43} + X_{55} + X_{67} & \quad (115) \\
& + X_{79} + X_{91} + X_{103} + X_{115} = +2 \quad (\text{B7}) \quad (116) \\
X_8 + X_{20} + X_{32} + X_{44} + X_{56} + X_{68} & \quad (117) \\
& + X_{80} + X_{92} + X_{104} + X_{116} = +29 \quad (\text{B8}) \quad (118) \\
X_9 + X_{21} + X_{33} + X_{45} + X_{57} + X_{69} & \quad (119) \\
& + X_{81} + X_{93} + X_{105} + X_{117} = +2 \quad (\text{B9}) \quad (120) \\
X_{10} + X_{22} + X_{34} + X_{46} + X_{58} + X_{70} & \quad (121) \\
& + X_{82} + X_{94} + X_{106} + X_{118} = +5 \quad (\text{B10}) \quad (122) \\
X_{11} + X_{23} + X_{35} + X_{47} + X_{59} + X_{71} & \quad (123) \\
& + X_{83} + X_{95} + X_{107} + X_{119} = +41 \quad (\text{B11}) \quad (124) \\
& \quad (125)
\end{aligned}$$

### 3.2 不等式约束 (120 个)

$$\begin{aligned}
X_0 - 2Y_0 &\leq +0 \quad (\text{G0}) \quad (126) \\
X_1 - 7Y_1 &\leq +0 \quad (\text{G1}) \quad (127) \\
X_2 - 13Y_2 &\leq +0 \quad (\text{G2}) \quad (128) \\
X_3 - 3Y_3 &\leq +0 \quad (\text{G3}) \quad (129) \\
X_4 - 14Y_4 &\leq +0 \quad (\text{G4}) \quad (130) \\
X_5 - 14Y_5 &\leq +0 \quad (\text{G5}) \quad (131) \\
X_6 - 2Y_6 &\leq +0 \quad (\text{G6}) \quad (132) \\
X_7 - 2Y_7 &\leq +0 \quad (\text{G7}) \quad (133) \\
X_8 - 14Y_8 &\leq +0 \quad (\text{G8}) \quad (134) \\
X_9 - 2Y_9 &\leq +0 \quad (\text{G9}) \quad (135) \\
X_{10} - 5Y_{10} &\leq +0 \quad (\text{G10}) \quad (136) \\
X_{11} - 14Y_{11} &\leq +0 \quad (\text{G11}) \quad (137) \\
X_{12} - 2Y_{12} &\leq +0 \quad (\text{G12}) \quad (138)
\end{aligned}$$

$X_{13} - 7Y_{13} \leq +0$	(G13)	(139)
$X_{14} - 13Y_{14} \leq +0$	(G14)	(140)
$X_{15} - 3Y_{15} \leq +0$	(G15)	(141)
$X_{16} - 21Y_{16} \leq +0$	(G16)	(142)
$X_{17} - 16Y_{17} \leq +0$	(G17)	(143)
$X_{18} - 2Y_{18} \leq +0$	(G18)	(144)
$X_{19} - 2Y_{19} \leq +0$	(G19)	(145)
$X_{20} - 21Y_{20} \leq +0$	(G20)	(146)
$X_{21} - 2Y_{21} \leq +0$	(G21)	(147)
$X_{22} - 5Y_{22} \leq +0$	(G22)	(148)
$X_{23} - 21Y_{23} \leq +0$	(G23)	(149)
$X_{24} - 2Y_{24} \leq +0$	(G24)	(150)
$X_{25} - 7Y_{25} \leq +0$	(G25)	(151)
$X_{26} - 13Y_{26} \leq +0$	(G26)	(152)
$X_{27} - 3Y_{27} \leq +0$	(G27)	(153)
$X_{28} - 28Y_{28} \leq +0$	(G28)	(154)
$X_{29} - 16Y_{29} \leq +0$	(G29)	(155)
$X_{30} - 2Y_{30} \leq +0$	(G30)	(156)
$X_{31} - 2Y_{31} \leq +0$	(G31)	(157)
$X_{32} - 29Y_{32} \leq +0$	(G32)	(158)
$X_{33} - 2Y_{33} \leq +0$	(G33)	(159)
$X_{34} - 5Y_{34} \leq +0$	(G34)	(160)
$X_{35} - 30Y_{35} \leq +0$	(G35)	(161)
$X_{36} - 2Y_{36} \leq +0$	(G36)	(162)
$X_{37} - 7Y_{37} \leq +0$	(G37)	(163)
$X_{38} - 13Y_{38} \leq +0$	(G38)	(164)
$X_{39} - 3Y_{39} \leq +0$	(G39)	(165)
$X_{40} - 17Y_{40} \leq +0$	(G40)	(166)
$X_{41} - 16Y_{41} \leq +0$	(G41)	(167)
$X_{42} - 2Y_{42} \leq +0$	(G42)	(168)
$X_{43} - 2Y_{43} \leq +0$	(G43)	(169)
$X_{44} - 17Y_{44} \leq +0$	(G44)	(170)
$X_{45} - 2Y_{45} \leq +0$	(G45)	(171)
$X_{46} - 5Y_{46} \leq +0$	(G46)	(172)
$X_{47} - 17Y_{47} \leq +0$	(G47)	(173)
$X_{48} - 2Y_{48} \leq +0$	(G48)	(174)
$X_{49} - 7Y_{49} \leq +0$	(G49)	(175)
$X_{50} - 8Y_{50} \leq +0$	(G50)	(176)
$X_{51} - 3Y_{51} \leq +0$	(G51)	(177)
$X_{52} - 8Y_{52} \leq +0$	(G52)	(178)
$X_{53} - 8Y_{53} \leq +0$	(G53)	(179)
$X_{54} - 2Y_{54} \leq +0$	(G54)	(180)

$X_{55} - 2Y_{55} \leq +0$	(G55)	(181)
$X_{56} - 8Y_{56} \leq +0$	(G56)	(182)
$X_{57} - 2Y_{57} \leq +0$	(G57)	(183)
$X_{58} - 5Y_{58} \leq +0$	(G58)	(184)
$X_{59} - 8Y_{59} \leq +0$	(G59)	(185)
$X_{60} - 2Y_{60} \leq +0$	(G60)	(186)
$X_{61} - 7Y_{61} \leq +0$	(G61)	(187)
$X_{62} - 10Y_{62} \leq +0$	(G62)	(188)
$X_{63} - 3Y_{63} \leq +0$	(G63)	(189)
$X_{64} - 10Y_{64} \leq +0$	(G64)	(190)
$X_{65} - 10Y_{65} \leq +0$	(G65)	(191)
$X_{66} - 2Y_{66} \leq +0$	(G66)	(192)
$X_{67} - 2Y_{67} \leq +0$	(G67)	(193)
$X_{68} - 10Y_{68} \leq +0$	(G68)	(194)
$X_{69} - 2Y_{69} \leq +0$	(G69)	(195)
$X_{70} - 5Y_{70} \leq +0$	(G70)	(196)
$X_{71} - 10Y_{71} \leq +0$	(G71)	(197)
$X_{72} - 2Y_{72} \leq +0$	(G72)	(198)
$X_{73} - 7Y_{73} \leq +0$	(G73)	(199)
$X_{74} - 13Y_{74} \leq +0$	(G74)	(200)
$X_{75} - 3Y_{75} \leq +0$	(G75)	(201)
$X_{76} - 28Y_{76} \leq +0$	(G76)	(202)
$X_{77} - 16Y_{77} \leq +0$	(G77)	(203)
$X_{78} - 2Y_{78} \leq +0$	(G78)	(204)
$X_{79} - 2Y_{79} \leq +0$	(G79)	(205)
$X_{80} - 28Y_{80} \leq +0$	(G80)	(206)
$X_{81} - 2Y_{81} \leq +0$	(G81)	(207)
$X_{82} - 5Y_{82} \leq +0$	(G82)	(208)
$X_{83} - 28Y_{83} \leq +0$	(G83)	(209)
$X_{84} - 2Y_{84} \leq +0$	(G84)	(210)
$X_{85} - 5Y_{85} \leq +0$	(G85)	(211)
$X_{86} - 5Y_{86} \leq +0$	(G86)	(212)
$X_{87} - 3Y_{87} \leq +0$	(G87)	(213)
$X_{88} - 5Y_{88} \leq +0$	(G88)	(214)
$X_{89} - 5Y_{89} \leq +0$	(G89)	(215)
$X_{90} - 2Y_{90} \leq +0$	(G90)	(216)
$X_{91} - 2Y_{91} \leq +0$	(G91)	(217)
$X_{92} - 5Y_{92} \leq +0$	(G92)	(218)
$X_{93} - 2Y_{93} \leq +0$	(G93)	(219)
$X_{94} - 5Y_{94} \leq +0$	(G94)	(220)
$X_{95} - 5Y_{95} \leq +0$	(G95)	(221)
$X_{96} - 2Y_{96} \leq +0$	(G96)	(222)

$X_{97} - 5Y_{97} \leq +0$	(G97)	(223)
$X_{98} - 5Y_{98} \leq +0$	(G98)	(224)
$X_{99} - 3Y_{99} \leq +0$	(G99)	(225)
$X_{100} - 5Y_{100} \leq +0$	(G100)	(226)
$X_{101} - 5Y_{101} \leq +0$	(G101)	(227)
$X_{102} - 2Y_{102} \leq +0$	(G102)	(228)
$X_{103} - 2Y_{103} \leq +0$	(G103)	(229)
$X_{104} - 5Y_{104} \leq +0$	(G104)	(230)
$X_{105} - 2Y_{105} \leq +0$	(G105)	(231)
$X_{106} - 5Y_{106} \leq +0$	(G106)	(232)
$X_{107} - 5Y_{107} \leq +0$	(G107)	(233)
$X_{108} - 2Y_{108} \leq +0$	(G108)	(234)
$X_{109} - 7Y_{109} \leq +0$	(G109)	(235)
$X_{110} - 12Y_{110} \leq +0$	(G110)	(236)
$X_{111} - 3Y_{111} \leq +0$	(G111)	(237)
$X_{112} - 12Y_{112} \leq +0$	(G112)	(238)
$X_{113} - 12Y_{113} \leq +0$	(G113)	(239)
$X_{114} - 2Y_{114} \leq +0$	(G114)	(240)
$X_{115} - 2Y_{115} \leq +0$	(G115)	(241)
$X_{116} - 12Y_{116} \leq +0$	(G116)	(242)
$X_{117} - 2Y_{117} \leq +0$	(G117)	(243)
$X_{118} - 5Y_{118} \leq +0$	(G118)	(244)
$X_{119} - 12Y_{119} \leq +0$	(G119)	(245)
		(246)

## 4 变量定义

### 4.1 二元变量 (120 个)

$$Y_i \in \{0, 1\}, \quad i \in \{0, 1, 2, \dots, 119\} \quad (247)$$

二元变量示例 (显示前 50 个, 共 120 个):

$Y_{118}, Y_0, Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7, Y_8,$   
 $Y_9, Y_{10}, Y_{11}, Y_{12}, Y_{13}, Y_{14}, Y_{15}, Y_{16}, Y_{17}, Y_{18},$   
 $Y_{19}, Y_{20}, Y_{21}, Y_{22}, Y_{23}, Y_{24}, Y_{25}, Y_{26}, Y_{27}, Y_{28},$   
 $Y_{29}, Y_{30}, Y_{31}, Y_{32}, Y_{33}, Y_{34}, Y_{35}, Y_{36}, Y_{37}, Y_{38},$   
 $Y_{39}, Y_{40}, Y_{41}, Y_{42}, Y_{43}, Y_{44}, Y_{45}, Y_{46}, Y_{47}, Y_{48}$   
 ... 还有 70 个二元变量

### 4.2 连续变量 (120 个)

所有连续变量均为非负实数:

$$X_j \geq 0, \quad j \in \{0, 1, 2, \dots, 119\} \quad (248)$$

**连续变量说明:** 模型包含 120 个连续决策变量, 所有变量的取值范围均为非负实数域。