

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: ran10x10b.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:

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

Y 变量: 100 个, 系数范围 [109, 419]

X 变量: 100 个, 系数范围 [1, 9]

完整目标函数:

$$\min \quad Z = 250Y_{98} + 321Y_0 + 339Y_1 \quad (2)$$

$$+ 133Y_2 + 395Y_3 + 410Y_4 \quad (3)$$

$$+ 418Y_5 + 216Y_6 + 329Y_7 \quad (4)$$

$$+ 189Y_8 + 214Y_9 + 348Y_{10} \quad (5)$$

$$+ 180Y_{11} + 391Y_{12} + 245Y_{13} \quad (6)$$

$$+ 296Y_{14} + 165Y_{15} + 416Y_{16} \quad (7)$$

$$+ 404Y_{17} + 337Y_{18} + 126Y_{19} \quad (8)$$

$$+ 319Y_{20} + 194Y_{21} + 236Y_{22} \quad (9)$$

$$+ 229Y_{23} + 255Y_{24} + 128Y_{25} \quad (10)$$

$$+ 140Y_{26} + 392Y_{27} + 338Y_{28} \quad (11)$$

$$+ 419Y_{29} + 185Y_{30} + 218Y_{31} \quad (12)$$

$$+ 188Y_{32} + 332Y_{33} + 317Y_{34} \quad (13)$$

$$+ 357Y_{35} + 200Y_{36} + 315Y_{37} \quad (14)$$

$$+ 384Y_{38} + 273Y_{39} + 143Y_{40} \quad (15)$$

$$+ 387Y_{41} + 369Y_{42} + 369Y_{43} \quad (16)$$

$$+ 175Y_{44} + 109Y_{45} + 229Y_{46} \quad (17)$$

$$+ 410Y_{47} + 241Y_{48} + 171Y_{49} \quad (18)$$

$$+ 351Y_{50} + 224Y_{51} + 419Y_{52} \quad (19)$$

$$+ 182Y_{53} + 178Y_{54} + 177Y_{55} \quad (20)$$

$$+ 189Y_{56} + 346Y_{57} + 299Y_{58} \quad (21)$$

$$+ 190Y_{59} + 114Y_{60} + 408Y_{61} \quad (22)$$

$$+ 374Y_{62} + 236Y_{63} + 278Y_{64} \quad (23)$$

$$+ 410Y_{65} + 159Y_{66} + 130Y_{67} \quad (24)$$

$$+ 229Y_{68} + 311Y_{69} + 153Y_{70} \quad (25)$$

$$+ 142Y_{71} + 205Y_{72} + 360Y_{73} \quad (26)$$

$$+ 135Y_{74} + 174Y_{75} + 342Y_{76} \quad (27)$$

$$+ 377Y_{77} + 245Y_{78} + 346Y_{79} \quad (28)$$

$$+ 401Y_{80} + 116Y_{81} + 325Y_{82} \quad (29)$$

$$+ 331Y_{83} + 149Y_{84} + 272Y_{85} \quad (30)$$

$$+ 116Y_{86} + 374Y_{87} + 280Y_{88} \quad (31)$$

$$+ 404Y_{89} + 167Y_{90} + 329Y_{91} \quad (32)$$

$$+ 277Y_{92} + 329Y_{93} + 338Y_{94} \quad (33)$$

$$+ 324Y_{95} + 217Y_{96} + 319Y_{97} \quad (34)$$

$$+ 374Y_{99} + 6X_0 + 3X_1 \quad (35)$$

$$+ 7X_2 + 2X_3 + 5X_4 \quad (36)$$

$$+ 1X_5 + 5X_6 + 8X_7 \quad (37)$$

$$+ 2X_8 + 8X_9 + 6X_{10} \quad (38)$$

$$+ 3X_{11} + 5X_{12} + 3X_{13} \quad (39)$$

$$+ 3X_{14} + 5X_{15} + 2X_{16} \quad (40)$$

$$+ 7X_{17} + 4X_{18} + 3X_{19} \quad (41)$$

$$+ 4X_{20} + 9X_{21} + 7X_{22} \quad (42)$$

$$+ 2X_{23} + 7X_{24} + 5X_{25} \quad (43)$$

$$+ 2X_{26} + 5X_{27} + 3X_{28} \quad (44)$$

$$+ 1X_{29} + 1X_{30} + 7X_{31} \quad (45)$$

$$+ 2X_{32} + 2X_{33} + 3X_{34} \quad (46)$$

$$+ 2X_{35} + 4X_{36} + 4X_{37} \quad (47)$$

$$+ 8X_{38} + 2X_{39} + 1X_{40} \quad (48)$$

$$+ 7X_{41} + 6X_{42} + 6X_{43} \quad (49)$$

$$+ 9X_{44} + 5X_{45} + 1X_{46} \quad (50)$$

$$+ 5X_{47} + 4X_{48} + 7X_{49} \quad (51)$$

$$+ 4X_{50} + 4X_{51} + 1X_{52} \quad (52)$$

$$+ 4X_{53} + 8X_{54} + 8X_{55} \quad (53)$$

$$+ 3X_{56} + 6X_{57} + 4X_{58} \quad (54)$$

$$+ 8X_{59} + 7X_{60} + 5X_{61} \quad (55)$$

$$+ 4X_{62} + 7X_{63} + 4X_{64} \quad (56)$$

$$+ 5X_{65} + 8X_{66} + 6X_{67} \quad (57)$$

$$+ 1X_{68} + 3X_{69} + 5X_{70} \quad (58)$$

$$+ 1X_{71} + 2X_{72} + 8X_{73} \quad (59)$$

$$+ 8X_{74} + 5X_{75} + 8X_{76} \quad (60)$$

$$+ 3X_{77} + 2X_{78} + 5X_{79} \quad (61)$$

$$+ 9X_{80} + 7X_{81} + 9X_{82} \quad (62)$$

$$+ 2X_{83} + 4X_{84} + 2X_{85} \quad (63)$$

$$+ 8X_{86} + 4X_{87} + 6X_{88} \quad (64)$$

$$+ 8X_{89} + 3X_{90} + 7X_{91} \quad (65)$$

$$+ 4X_{92} + 8X_{93} + 3X_{94} \quad (66)$$

$$+ 5X_{95} + 5X_{96} + 3X_{97} \quad (67)$$

$$+ 9X_{98} + 4X_{99}$$

3 约束条件

3.1 等式约束 (20 个)

$$X_0 + X_1 + X_2 + X_3 + X_4 + X_5 \quad (68)$$

$$+ X_6 + X_7 + X_8 + X_9 = +16 \quad (\text{A0}) \quad (69)$$

$$X_{10} + X_{11} + X_{12} + X_{13} + X_{14} + X_{15} \quad (70)$$

$$+ X_{16} + X_{17} + X_{18} + X_{19} = +7 \quad (\text{A1}) \quad (71)$$

$$X_{20} + X_{21} + X_{22} + X_{23} + X_{24} + X_{25} \quad (72)$$

$$+ X_{26} + X_{27} + X_{28} + X_{29} = +4 \quad (\text{A2}) \quad (73)$$

$$X_{30} + X_{31} + X_{32} + X_{33} + X_{34} + X_{35} \quad (74)$$

$$+ X_{36} + X_{37} + X_{38} + X_{39} = +17 \quad (\text{A3}) \quad (75)$$

$$X_{40} + X_{41} + X_{42} + X_{43} + X_{44} + X_{45} \quad (76)$$

$$+ X_{46} + X_{47} + X_{48} + X_{49} = +5 \quad (\text{A4}) \quad (77)$$

$$X_{50} + X_{51} + X_{52} + X_{53} + X_{54} + X_{55} \quad (78)$$

$$+ X_{56} + X_{57} + X_{58} + X_{59} = +12 \quad (\text{A5}) \quad (79)$$

$$X_{60} + X_{61} + X_{62} + X_{63} + X_{64} + X_{65} \quad (80)$$

$$+ X_{66} + X_{67} + X_{68} + X_{69} = +9 \quad (\text{A6}) \quad (81)$$

$$X_{70} + X_{71} + X_{72} + X_{73} + X_{74} + X_{75} \quad (82)$$

$$+ X_{76} + X_{77} + X_{78} + X_{79} = +3 \quad (\text{A7}) \quad (83)$$

$$X_{80} + X_{81} + X_{82} + X_{83} + X_{84} + X_{85} \quad (84)$$

$$+ X_{86} + X_{87} + X_{88} + X_{89} = +4 \quad (\text{A8}) \quad (85)$$

$$X_{90} + X_{91} + X_{92} + X_{93} + X_{94} + X_{95} \quad (86)$$

$$+ X_{96} + X_{97} + X_{98} + X_{99} = +23 \quad (\text{A9}) \quad (87)$$

$$X_0 + X_{10} + X_{20} + X_{30} + X_{40} + X_{50} \quad (88)$$

$$+ X_{60} + X_{70} + X_{80} + X_{90} = +3 \quad (\text{B0}) \quad (89)$$

$$X_1 + X_{11} + X_{21} + X_{31} + X_{41} + X_{51} \quad (90)$$

$$+ X_{61} + X_{71} + X_{81} + X_{91} = +15 \quad (\text{B1}) \quad (91)$$

$$X_2 + X_{12} + X_{22} + X_{32} + X_{42} + X_{52} \quad (92)$$

$$+ X_{62} + X_{72} + X_{82} + X_{92} = +6 \quad (\text{B2}) \quad (93)$$

$$X_3 + X_{13} + X_{23} + X_{33} + X_{43} + X_{53} \quad (94)$$

$$+ X_{63} + X_{73} + X_{83} + X_{93} = +18 \quad (\text{B3}) \quad (95)$$

$$X_4 + X_{14} + X_{24} + X_{34} + X_{44} + X_{54} \quad (96)$$

$$+ X_{64} + X_{74} + X_{84} + X_{94} = +17 \quad (\text{B4}) \quad (97)$$

$$X_5 + X_{15} + X_{25} + X_{35} + X_{45} + X_{55} \quad (98)$$

$$+ X_{65} + X_{75} + X_{85} + X_{95} = +3 \quad (\text{B5}) \quad (99)$$

$$X_6 + X_{16} + X_{26} + X_{36} + X_{46} + X_{56} \quad (100)$$

$$\begin{aligned}
& + X_{66} + X_{76} + X_{86} + X_{96} & = +19 & (B6) & (101) \\
X_7 + X_{17} + X_{27} + X_{37} + X_{47} + X_{57} & & & & (102) \\
& + X_{67} + X_{77} + X_{87} + X_{97} & = +9 & (B7) & (103) \\
X_8 + X_{18} + X_{28} + X_{38} + X_{48} + X_{58} & & & & (104) \\
& + X_{68} + X_{78} + X_{88} + X_{98} & = +1 & (B8) & (105) \\
X_9 + X_{19} + X_{29} + X_{39} + X_{49} + X_{59} & & & & (106) \\
& + X_{69} + X_{79} + X_{89} + X_{99} & = +9 & (B9) & (107) \\
& & & & (108)
\end{aligned}$$

3.2 不等式约束 (100 个)

$$\begin{aligned}
X_0 - 3Y_0 &\leq +0 & (G0) & (109) \\
X_1 - 15Y_1 &\leq +0 & (G1) & (110) \\
X_2 - 6Y_2 &\leq +0 & (G2) & (111) \\
X_3 - 16Y_3 &\leq +0 & (G3) & (112) \\
X_4 - 16Y_4 &\leq +0 & (G4) & (113) \\
X_5 - 3Y_5 &\leq +0 & (G5) & (114) \\
X_6 - 16Y_6 &\leq +0 & (G6) & (115) \\
X_7 - 9Y_7 &\leq +0 & (G7) & (116) \\
X_8 - Y_8 &\leq +0 & (G8) & (117) \\
X_9 - 9Y_9 &\leq +0 & (G9) & (118) \\
X_{10} - 3Y_{10} &\leq +0 & (G10) & (119) \\
X_{11} - 7Y_{11} &\leq +0 & (G11) & (120) \\
X_{12} - 6Y_{12} &\leq +0 & (G12) & (121) \\
X_{13} - 7Y_{13} &\leq +0 & (G13) & (122) \\
X_{14} - 7Y_{14} &\leq +0 & (G14) & (123) \\
X_{15} - 3Y_{15} &\leq +0 & (G15) & (124) \\
X_{16} - 7Y_{16} &\leq +0 & (G16) & (125) \\
X_{17} - 7Y_{17} &\leq +0 & (G17) & (126) \\
X_{18} - Y_{18} &\leq +0 & (G18) & (127) \\
X_{19} - 7Y_{19} &\leq +0 & (G19) & (128) \\
X_{20} - 3Y_{20} &\leq +0 & (G20) & (129) \\
X_{21} - 4Y_{21} &\leq +0 & (G21) & (130) \\
X_{22} - 4Y_{22} &\leq +0 & (G22) & (131) \\
X_{23} - 4Y_{23} &\leq +0 & (G23) & (132) \\
X_{24} - 4Y_{24} &\leq +0 & (G24) & (133) \\
X_{25} - 3Y_{25} &\leq +0 & (G25) & (134) \\
X_{26} - 4Y_{26} &\leq +0 & (G26) & (135) \\
X_{27} - 4Y_{27} &\leq +0 & (G27) & (136) \\
X_{28} - Y_{28} &\leq +0 & (G28) & (137) \\
X_{29} - 4Y_{29} &\leq +0 & (G29) & (138) \\
X_{30} - 3Y_{30} &\leq +0 & (G30) & (139)
\end{aligned}$$

$X_{31} - 15Y_{31} \leq +0$	(G31)	(140)
$X_{32} - 6Y_{32} \leq +0$	(G32)	(141)
$X_{33} - 17Y_{33} \leq +0$	(G33)	(142)
$X_{34} - 17Y_{34} \leq +0$	(G34)	(143)
$X_{35} - 3Y_{35} \leq +0$	(G35)	(144)
$X_{36} - 17Y_{36} \leq +0$	(G36)	(145)
$X_{37} - 9Y_{37} \leq +0$	(G37)	(146)
$X_{38} - Y_{38} \leq +0$	(G38)	(147)
$X_{39} - 9Y_{39} \leq +0$	(G39)	(148)
$X_{40} - 3Y_{40} \leq +0$	(G40)	(149)
$X_{41} - 5Y_{41} \leq +0$	(G41)	(150)
$X_{42} - 5Y_{42} \leq +0$	(G42)	(151)
$X_{43} - 5Y_{43} \leq +0$	(G43)	(152)
$X_{44} - 5Y_{44} \leq +0$	(G44)	(153)
$X_{45} - 3Y_{45} \leq +0$	(G45)	(154)
$X_{46} - 5Y_{46} \leq +0$	(G46)	(155)
$X_{47} - 5Y_{47} \leq +0$	(G47)	(156)
$X_{48} - Y_{48} \leq +0$	(G48)	(157)
$X_{49} - 5Y_{49} \leq +0$	(G49)	(158)
$X_{50} - 3Y_{50} \leq +0$	(G50)	(159)
$X_{51} - 12Y_{51} \leq +0$	(G51)	(160)
$X_{52} - 6Y_{52} \leq +0$	(G52)	(161)
$X_{53} - 12Y_{53} \leq +0$	(G53)	(162)
$X_{54} - 12Y_{54} \leq +0$	(G54)	(163)
$X_{55} - 3Y_{55} \leq +0$	(G55)	(164)
$X_{56} - 12Y_{56} \leq +0$	(G56)	(165)
$X_{57} - 9Y_{57} \leq +0$	(G57)	(166)
$X_{58} - Y_{58} \leq +0$	(G58)	(167)
$X_{59} - 9Y_{59} \leq +0$	(G59)	(168)
$X_{60} - 3Y_{60} \leq +0$	(G60)	(169)
$X_{61} - 9Y_{61} \leq +0$	(G61)	(170)
$X_{62} - 6Y_{62} \leq +0$	(G62)	(171)
$X_{63} - 9Y_{63} \leq +0$	(G63)	(172)
$X_{64} - 9Y_{64} \leq +0$	(G64)	(173)
$X_{65} - 3Y_{65} \leq +0$	(G65)	(174)
$X_{66} - 9Y_{66} \leq +0$	(G66)	(175)
$X_{67} - 9Y_{67} \leq +0$	(G67)	(176)
$X_{68} - Y_{68} \leq +0$	(G68)	(177)
$X_{69} - 9Y_{69} \leq +0$	(G69)	(178)
$X_{70} - 3Y_{70} \leq +0$	(G70)	(179)
$X_{71} - 3Y_{71} \leq +0$	(G71)	(180)
$X_{72} - 3Y_{72} \leq +0$	(G72)	(181)

$X_{73} - 3Y_{73} \leq +0$	(G73)	(182)
$X_{74} - 3Y_{74} \leq +0$	(G74)	(183)
$X_{75} - 3Y_{75} \leq +0$	(G75)	(184)
$X_{76} - 3Y_{76} \leq +0$	(G76)	(185)
$X_{77} - 3Y_{77} \leq +0$	(G77)	(186)
$X_{78} - Y_{78} \leq +0$	(G78)	(187)
$X_{79} - 3Y_{79} \leq +0$	(G79)	(188)
$X_{80} - 3Y_{80} \leq +0$	(G80)	(189)
$X_{81} - 4Y_{81} \leq +0$	(G81)	(190)
$X_{82} - 4Y_{82} \leq +0$	(G82)	(191)
$X_{83} - 4Y_{83} \leq +0$	(G83)	(192)
$X_{84} - 4Y_{84} \leq +0$	(G84)	(193)
$X_{85} - 3Y_{85} \leq +0$	(G85)	(194)
$X_{86} - 4Y_{86} \leq +0$	(G86)	(195)
$X_{87} - 4Y_{87} \leq +0$	(G87)	(196)
$X_{88} - Y_{88} \leq +0$	(G88)	(197)
$X_{89} - 4Y_{89} \leq +0$	(G89)	(198)
$X_{90} - 3Y_{90} \leq +0$	(G90)	(199)
$X_{91} - 15Y_{91} \leq +0$	(G91)	(200)
$X_{92} - 6Y_{92} \leq +0$	(G92)	(201)
$X_{93} - 18Y_{93} \leq +0$	(G93)	(202)
$X_{94} - 17Y_{94} \leq +0$	(G94)	(203)
$X_{95} - 3Y_{95} \leq +0$	(G95)	(204)
$X_{96} - 19Y_{96} \leq +0$	(G96)	(205)
$X_{97} - 9Y_{97} \leq +0$	(G97)	(206)
$X_{98} - Y_{98} \leq +0$	(G98)	(207)
$X_{99} - 9Y_{99} \leq +0$	(G99)	(208)
		(209)

4 变量定义

4.1 二元变量 (100 个)

$$Y_i \in \{0, 1\}, \quad i \in \{0, 1, 2, \dots, 99\} \quad (210)$$

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:

$$X_j \geq 0, \quad j \in \{0, 1, 2, \dots, 99\} \quad (211)$$

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。