# 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:** `ran10x26.mps`

模型名: RAN10X26

变量总数: 520

约束总数: 296

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: 260 个, 系数范围 $[65, 263]$

X 变量: 260 个, 系数范围 $[1, 10]$

**完整目标函数:**

$$\min \quad Z = 106Y_{258} + 233Y_0 + 158Y_1 \tag{2}$$
$$+ 206Y_2 + 171Y_3 + 125Y_4 \tag{3}$$
$$+ 163Y_5 + 240Y_6 + 222Y_7 \tag{4}$$
$$+ 146Y_8 + 116Y_9 + 253Y_{10} \tag{5}$$
$$+ 126Y_{11} + 119Y_{12} + 74Y_{13} \tag{6}$$
$$+ 147Y_{14} + 191Y_{15} + 76Y_{16} \tag{7}$$
$$+ 249Y_{17} + 198Y_{18} + 200Y_{19} \tag{8}$$
$$+ 194Y_{20} + 181Y_{21} + 96Y_{22} \tag{9}$$
$$+ 227Y_{23} + 246Y_{24} + 211Y_{25} \tag{10}$$
$$+ 78Y_{26} + 109Y_{27} + 182Y_{28} \tag{11}$$
$$+ 110Y_{29} + 131Y_{30} + 134Y_{31} \tag{12}$$
$$+ 207Y_{32} + 170Y_{33} + 136Y_{34} \tag{13}$$
$$+ 216Y_{35} + 261Y_{36} + 86Y_{37} \tag{14}$$
$$+ 123Y_{38} + 174Y_{39} + 240Y_{40} \tag{15}$$
$$+ 137Y_{41} + 125Y_{42} + 192Y_{43} \tag{16}$$
$$+ 92Y_{44} + 238Y_{45} + 181Y_{46} \tag{17}$$
$$+ 84Y_{47} + 227Y_{48} + 161Y_{49} \tag{18}$$
$$+ 135Y_{50} + 230Y_{51} + 95Y_{52} \tag{19}$$
$$+ 111Y_{53} + 69Y_{54} + 107Y_{55} \tag{20}$$
$$+ 135Y_{56} + 76Y_{57} + 108Y_{58} \tag{21}$$
$$+ 112Y_{59} + 221Y_{60} + 74Y_{61} \tag{22}$$
$$+ 117Y_{62} + 172Y_{63} + 97Y_{64} \tag{23}$$
$$+ 120Y_{65} + 75Y_{66} + 250Y_{67} \tag{24}$$
$$+ 181Y_{68} + 177Y_{69} + 213Y_{70} \tag{25}$$

$$+ 117Y_{71} + 102Y_{72} + 130Y_{73} \tag{26}$$

$$+ 168Y_{74} + 250Y_{75} + 72Y_{76} \tag{27}$$

$$+ 182Y_{77} + 258Y_{78} + 161Y_{79} \tag{28}$$

$$+ 225Y_{80} + 76Y_{81} + 136Y_{82} \tag{29}$$

$$+ 182Y_{83} + 118Y_{84} + 141Y_{85} \tag{30}$$

$$+ 89Y_{86} + 108Y_{87} + 120Y_{88} \tag{31}$$

$$+ 98Y_{89} + 87Y_{90} + 262Y_{91} \tag{32}$$

$$+ 205Y_{92} + 263Y_{93} + 227Y_{94} \tag{33}$$

$$+ 230Y_{95} + 262Y_{96} + 212Y_{97} \tag{34}$$

$$+ 262Y_{98} + 129Y_{99} + 153Y_{100} \tag{35}$$

$$+ 178Y_{101} + 72Y_{102} + 82Y_{103} \tag{36}$$

$$+ 238Y_{104} + 107Y_{105} + 237Y_{106} \tag{37}$$

$$+ 136Y_{107} + 131Y_{108} + 199Y_{109} \tag{38}$$

$$+ 130Y_{110} + 221Y_{111} + 113Y_{112} \tag{39}$$

$$+ 125Y_{113} + 107Y_{114} + 146Y_{115} \tag{40}$$

$$+ 93Y_{116} + 104Y_{117} + 148Y_{118} \tag{41}$$

$$+ 156Y_{119} + 117Y_{120} + 239Y_{121} \tag{42}$$

$$+ 218Y_{122} + 197Y_{123} + 98Y_{124} \tag{43}$$

$$+ 255Y_{125} + 195Y_{126} + 151Y_{127} \tag{44}$$

$$+ 204Y_{128} + 133Y_{129} + 122Y_{130} \tag{45}$$

$$+ 243Y_{131} + 168Y_{132} + 234Y_{133} \tag{46}$$

$$+ 198Y_{134} + 213Y_{135} + 198Y_{136} \tag{47}$$

$$+ 113Y_{137} + 247Y_{138} + 122Y_{139} \tag{48}$$

$$+ 137Y_{140} + 210Y_{141} + 117Y_{142} \tag{49}$$

$$+ 263Y_{143} + 172Y_{144} + 218Y_{145} \tag{50}$$

$$+ 173Y_{146} + 109Y_{147} + 135Y_{148} \tag{51}$$

$$+ 189Y_{149} + 101Y_{150} + 176Y_{151} \tag{52}$$

$$+ 241Y_{152} + 134Y_{153} + 239Y_{154} \tag{53}$$

$$+ 76Y_{155} + 188Y_{156} + 260Y_{157} \tag{54}$$

$$+ 180Y_{158} + 100Y_{159} + 175Y_{160} \tag{55}$$

$$+ 197Y_{161} + 157Y_{162} + 135Y_{163} \tag{56}$$

$$+ 248Y_{164} + 244Y_{165} + 96Y_{166} \tag{57}$$

$$+ 221Y_{167} + 87Y_{168} + 138Y_{169} \tag{58}$$

$$+ 143Y_{170} + 117Y_{171} + 160Y_{172} \tag{59}$$

$$+ 181Y_{173} + 223Y_{174} + 181Y_{175} \tag{60}$$

$$+ 70Y_{176} + 209Y_{177} + 153Y_{178} \tag{61}$$

$$+ 121Y_{179} + 218Y_{180} + 70Y_{181} \tag{62}$$

$$+ 203Y_{182} + 203Y_{183} + 175Y_{184} \tag{63}$$

$$+ 201Y_{185} + 211Y_{186} + 122Y_{187} \tag{64}$$

$$+ 128Y_{188} + 198Y_{189} + 216Y_{190} \tag{65}$$

$$+ 161Y_{191} + 117Y_{192} + 164Y_{193} \tag{66}$$

$$+ 146Y_{194} + 198Y_{195} + 191Y_{196} \tag{67}$$

$$+ 188Y_{197} + 74Y_{198} + 75Y_{199} \tag{68}$$

$$+ 205Y_{200} + 70Y_{201} + 164Y_{202} \tag{69}$$

$$+ 182Y_{203} + 227Y_{204} + 83Y_{205} \tag{70}$$

$$+ 132Y_{206} + 85Y_{207} + 185Y_{208} \tag{71}$$

$$+ 91Y_{209} + 234Y_{210} + 175Y_{211} \tag{72}$$

$$+ 123Y_{212} + 109Y_{213} + 207Y_{214} \tag{73}$$

$$+ 104Y_{215} + 145Y_{216} + 127Y_{217} \tag{74}$$

$$+ 215Y_{218} + 125Y_{219} + 151Y_{220} \tag{75}$$

$$+ 254Y_{221} + 209Y_{222} + 180Y_{223} \tag{76}$$

$$+ 258Y_{224} + 242Y_{225} + 181Y_{226} \tag{77}$$

$$+ 185Y_{227} + 152Y_{228} + 158Y_{229} \tag{78}$$

$$+ 140Y_{230} + 66Y_{231} + 92Y_{232} \tag{79}$$

$$+ 164Y_{233} + 91Y_{234} + 65Y_{235} \tag{80}$$

$$+ 229Y_{236} + 261Y_{237} + 89Y_{238} \tag{81}$$

$$+ 183Y_{239} + 235Y_{240} + 200Y_{241} \tag{82}$$

$$+ 93Y_{242} + 168Y_{243} + 237Y_{244} \tag{83}$$

$$+ 79Y_{245} + 80Y_{246} + 235Y_{247} \tag{84}$$

$$+ 230Y_{248} + 147Y_{249} + 205Y_{250} \tag{85}$$

$$+ 247Y_{251} + 148Y_{252} + 91Y_{253} \tag{86}$$

$$+ 240Y_{254} + 176Y_{255} + 107Y_{256} \tag{87}$$

$$+ 211Y_{257} + 193Y_{259} + 7X_0 \tag{88}$$

$$+ 10X_1 + 10X_2 + 1X_3 \tag{89}$$

$$+ 6X_4 + 7X_5 + 10X_6 \tag{90}$$

$$+ 4X_7 + 10X_8 + 4X_9 \tag{91}$$

$$+ 9X_{10} + 8X_{11} + 2X_{12} \tag{92}$$

$$+ 7X_{13} + 10X_{14} + 8X_{15} \tag{93}$$

$$+ 9X_{16} + 2X_{17} + 2X_{18} \tag{94}$$

$$+ 5X_{19} + 8X_{20} + 8X_{21} \tag{95}$$

$$+ 7X_{22} + 3X_{23} + 6X_{24} \tag{96}$$

$$+ 5X_{25} + 1X_{26} + 7X_{27} \tag{97}$$

$$+ 10X_{28} + 7X_{29} + 1X_{30} \tag{98}$$

$$+ 9X_{31} + 10X_{32} + 10X_{33} \tag{99}$$

$$+ 9X_{34} + 10X_{35} + 3X_{36} \tag{100}$$

$$+ 7X_{37} + 9X_{38} + 3X_{39} \tag{101}$$

$$+ 10X_{40} + 6X_{41} + 7X_{42} \tag{102}$$

$$+ 6X_{43} + 1X_{44} + 3X_{45} \tag{103}$$

$$+ 8X_{46} + 6X_{47} + 3X_{48} \tag{104}$$

$$+ 8X_{49} + 8X_{50} + 10X_{51} \tag{105}$$

$$+ 4X_{52} + 10X_{53} + 4X_{54} \tag{106}$$

$$+ 4X_{55} + 10X_{56} + 10X_{57} \tag{107}$$

$$+ 3X_{58} + 10X_{59} + 8X_{60} \tag{108}$$

$$+ 8X_{61} + 5X_{62} + 2X_{63} \tag{109}$$

$$+ 6X_{64} + 2X_{65} + 9X_{66} \tag{110}$$

$$+ 2X_{67} + 8X_{68} + 6X_{69} \tag{111}$$

$$+ 4X_{70} + 5X_{71} + 9X_{72} \tag{112}$$

$$+ 5X_{73} + 8X_{74} + 3X_{75} \tag{113}$$

$$+ 7X_{76} + 10X_{77} + 6X_{78} \tag{114}$$

$$+ 8X_{79} + 1X_{80} + 10X_{81} \tag{115}$$

$$+ 10X_{82} + 10X_{83} + 1X_{84} \tag{116}$$

$$+ 3X_{85} + 10X_{86} + 3X_{87} \tag{117}$$

$$+ 3X_{88} + 6X_{89} + 9X_{90} \tag{118}$$

$$+ 2X_{91} + 6X_{92} + 2X_{93} \tag{119}$$

$$+ 9X_{94} + 6X_{95} + 2X_{96} \tag{120}$$

$$+ 5X_{97} + 3X_{98} + 4X_{99} \tag{121}$$

$$+ 4X_{100} + 7X_{101} + 7X_{102} \tag{122}$$

$$+ 3X_{103} + 1X_{104} + 4X_{105} \tag{123}$$

$$+ 1X_{106} + 10X_{107} + 1X_{108} \tag{124}$$

$$+ 1X_{109} + 1X_{110} + 3X_{111} \tag{125}$$

$$+ 9X_{112} + 6X_{113} + 5X_{114} \tag{126}$$

$$+ 9X_{115} + 4X_{116} + 2X_{117} \tag{127}$$

$$+ 9X_{118} + 2X_{119} + 5X_{120} \tag{128}$$

$$+ 2X_{121} + 6X_{122} + 3X_{123} \tag{129}$$

$$+ 6X_{124} + 8X_{125} + 9X_{126} \tag{130}$$

$$+ 7X_{127} + 7X_{128} + 2X_{129} \tag{131}$$

$$+ 10X_{130} + 7X_{131} + 8X_{132} \tag{132}$$

$$+ 3X_{133} + 1X_{134} + 4X_{135} \tag{133}$$

$$+ 1X_{136} + 10X_{137} + 3X_{138} \tag{134}$$

$$+ 9X_{139} + 6X_{140} + 2X_{141} \tag{135}$$

$$+ 5X_{142} + 2X_{143} + 2X_{144} \tag{136}$$

$$+ 6X_{145} + 2X_{146} + 7X_{147} \tag{137}$$

$$+ 10X_{148} + 5X_{149} + 9X_{150} \tag{138}$$

$$+ 5X_{151} + 8X_{152} + 9X_{153} \tag{139}$$

$$+ 2X_{154} + 10X_{155} + 3X_{156} \tag{140}$$

$$+ 4X_{157} + 7X_{158} + 10X_{159} \tag{141}$$

$$+ 4X_{160} + 1X_{161} + 1X_{162} \tag{142}$$

$$+ 10X_{163} + 4X_{164} + 7X_{165} \tag{143}$$

$$+ 4X_{166} + 4X_{167} + 9X_{168} \tag{144}$$

$$+ 8X_{169} + 2X_{170} + 5X_{171} \tag{145}$$

$$+ 9X_{172} + 8X_{173} + 5X_{174} \tag{146}$$

$$+ 8X_{175} + 5X_{176} + 2X_{177} \tag{147}$$

$$+ 4X_{178} + 9X_{179} + 6X_{180} \tag{148}$$

$$+ 5X_{181} + 7X_{182} + 7X_{183} \tag{149}$$

$$+ 4X_{184} + 4X_{185} + 1X_{186} \tag{150}$$

$$+ 10X_{187} + 3X_{188} + 1X_{189} \tag{151}$$

$$+ 10X_{190} + 9X_{191} + 5X_{192} \tag{152}$$

$$+ 6X_{193} + 9X_{194} + 2X_{195} \tag{153}$$

$$+ 6X_{196} + 5X_{197} + 7X_{198} \tag{154}$$

$$+ 9X_{199} + 10X_{200} + 5X_{201} \tag{155}$$

$$+ 6X_{202} + 8X_{203} + 3X_{204} \tag{156}$$

$$+ 5X_{205} + 3X_{206} + 6X_{207} \tag{157}$$

$$+ 1X_{208} + 1X_{209} + 4X_{210} \tag{158}$$

$$+ 4X_{211} + 10X_{212} + 7X_{213} \tag{159}$$

$$+ 10X_{214} + 1X_{215} + 2X_{216} \tag{160}$$

$$+ 8X_{217} + 9X_{218} + 6X_{219} \tag{161}$$

$$+ 6X_{220} + 9X_{221} + 2X_{222} \tag{162}$$

$$+ 9X_{223} + 6X_{224} + 9X_{225} \tag{163}$$

$$+ 8X_{226} + 3X_{227} + 6X_{228} \tag{164}$$

$$+ 1X_{229} + 4X_{230} + 2X_{231} \tag{165}$$

$$+ 1X_{232} + 6X_{233} + 1X_{234} \tag{166}$$

$$+ 1X_{235} + 10X_{236} + 4X_{237} \tag{167}$$

$$+ 10X_{238} + 9X_{239} + 5X_{240} \tag{168}$$

$$+ 5X_{241} + 2X_{242} + 8X_{243} \tag{169}$$

$$+ 2X_{244} + 3X_{245} + 2X_{246} \tag{170}$$

$$+ 5X_{247} + 10X_{248} + 10X_{249} \tag{171}$$

$$+ 6X_{250} + 5X_{251} + 9X_{252} \tag{172}$$

$$+ 3X_{253} + 10X_{254} + 5X_{255} \tag{173}$$

$$+ 4X_{256} + 5X_{257} + 5X_{258} \tag{174}$$

$$+ 10X_{259}$$

# 3 约束条件

## 3.1 等式约束 (36 个)

$$X_{16} + X_{17} + X_{18} + X_{19} + X_{20} + X_{21} \tag{175}$$

$$+ X_{22} + X_{23} + X_{24} + X_{25} \qquad = +58 \qquad \text{(C\_1)} \tag{176}$$

$$X_{40} + X_{41} + X_{42} + X_{43} + X_{44} + X_{45} \tag{177}$$

$$+ X_{46} + X_{47} + X_{48} + X_{49} + X_{50} + X_{51} \quad = +31 \quad (C\_2) \tag{178}$$

$$X_{66} + X_{67} + X_{68} + X_{69} + X_{70} + X_{71} \tag{179}$$

$$+ X_{72} + X_{73} + X_{74} + X_{75} + X_{76} + X_{77} \quad = +29 \quad (C\_3) \tag{180}$$

$$X_{92} + X_{93} + X_{94} + X_{95} + X_{96} + X_{97} \tag{181}$$

$$+ X_{98} + X_{99} + X_{100} + X_{101} + X_{102} + X_{103} \quad = +25 \quad (C\_4) \tag{182}$$

$$= +21 \quad (C\_5) \tag{183}$$

$$= +43 \quad (C\_6) \tag{184}$$

$$= +11 \quad (C\_7) \tag{185}$$

$$= +54 \quad (C\_8) \tag{186}$$

$$= +18 \quad (C\_9) \tag{187}$$

$$= +60 \quad (C\_10) \tag{188}$$

$$X_0 + X_{26} + X_{52} + X_{78} + X_{104} + X_{130} \tag{189}$$

$$+ X_{156} + X_{182} + X_{208} + X_{234} \quad = +21 \quad (B0) \tag{190}$$

$$X_1 + X_{27} + X_{53} + X_{79} + X_{105} + X_{131} \tag{191}$$

$$+ X_{157} + X_{183} + X_{209} + X_{235} \quad = +8 \quad (B1) \tag{192}$$

$$X_2 + X_{28} + X_{54} + X_{80} + X_{106} + X_{132} \tag{193}$$

$$+ X_{158} + X_{184} + X_{210} + X_{236} \quad = +14 \quad (B2) \tag{194}$$

$$X_3 + X_{29} + X_{55} + X_{81} + X_{107} + X_{133} \tag{195}$$

$$+ X_{159} + X_{185} + X_{211} + X_{237} \quad = +10 \quad (B3) \tag{196}$$

$$X_4 + X_{30} + X_{56} + X_{82} + X_{108} + X_{134} \tag{197}$$

$$+ X_{160} + X_{186} + X_{212} + X_{238} \quad = +11 \quad (B4) \tag{198}$$

$$X_5 + X_{31} + X_{57} + X_{83} + X_{109} + X_{135} \tag{199}$$

$$+ X_{161} + X_{187} + X_{213} + X_{239} \quad = +19 \quad (B5) \tag{200}$$

$$X_6 + X_{32} + X_{58} + X_{84} + X_{110} + X_{136} \tag{201}$$

$$+ X_{162} + X_{188} + X_{214} + X_{240} \quad = +3 \quad (B6) \tag{202}$$

$$X_7 + X_{33} + X_{59} + X_{85} + X_{111} + X_{137} \tag{203}$$

$$+ X_{163} + X_{189} + X_{215} + X_{241} \quad = +6 \quad (B7) \tag{204}$$

$$X_8 + X_{34} + X_{60} + X_{86} + X_{112} + X_{138} \tag{205}$$

$$+ X_{164} + X_{190} + X_{216} + X_{242} \quad = +2 \quad (B8) \tag{206}$$

$$X_9 + X_{35} + X_{61} + X_{87} + X_{113} + X_{139} \tag{207}$$

$$+ X_{165} + X_{191} + X_{217} + X_{243} \quad = +7 \quad (B9) \tag{208}$$

$$X_{10} + X_{36} + X_{62} + X_{88} + X_{114} + X_{140} \tag{209}$$

$$+ X_{166} + X_{192} + X_{218} + X_{244} \quad = +29 \quad (B10) \tag{210}$$

$$X_{11} + X_{37} + X_{63} + X_{89} + X_{115} + X_{141} \tag{211}$$

$$+ X_{167} + X_{193} + X_{219} + X_{245} \quad = +56 \quad (B11) \tag{212}$$

$$X_{12} + X_{38} + X_{64} + X_{90} + X_{116} + X_{142} \tag{213}$$

$$+ X_{168} + X_{194} + X_{220} + X_{246} \quad = +4 \quad (B12) \tag{214}$$

$$X_{13} + X_{39} + X_{65} + X_{91} + X_{117} + X_{143} \tag{215}$$

$$+ X_{169} + X_{195} + X_{221} + X_{247} \quad = +6 \quad (B13) \tag{216}$$

$$X_{14} + X_{40} + X_{66} + X_{92} + X_{118} + X_{144} \tag{217}$$

$$+ X_{170} + X_{196} + X_{222} + X_{248} \quad = +27 \quad (B14) \tag{218}$$

$$X_{15} + X_{41} + X_{67} + X_{93} + X_{119} + X_{145} \tag{219}$$

$$+ X_{171} + X_{197} + X_{223} + X_{249} \quad = +2 \quad \text{(B15)} \tag{220}$$

$$X_{16} + X_{42} + X_{68} + X_{94} + X_{120} + X_{146} \tag{221}$$

$$+ X_{172} + X_{198} + X_{224} + X_{250} \quad = +8 \quad \text{(B16)} \tag{222}$$

$$X_{17} + X_{43} + X_{69} + X_{95} + X_{121} + X_{147} \tag{223}$$

$$+ X_{173} + X_{199} + X_{225} + X_{251} \quad = +8 \quad \text{(B17)} \tag{224}$$

$$X_{18} + X_{44} + X_{70} + X_{96} + X_{122} + X_{148} \tag{225}$$

$$+ X_{174} + X_{200} + X_{226} + X_{252} \quad = +30 \quad \text{(B18)} \tag{226}$$

$$X_{19} + X_{45} + X_{71} + X_{97} + X_{123} + X_{149} \tag{227}$$

$$+ X_{175} + X_{201} + X_{227} + X_{253} \quad = +11 \quad \text{(B19)} \tag{228}$$

$$X_{20} + X_{46} + X_{72} + X_{98} + X_{124} + X_{150} \tag{229}$$

$$+ X_{176} + X_{202} + X_{228} + X_{254} \quad = +6 \quad \text{(B20)} \tag{230}$$

$$X_{21} + X_{47} + X_{73} + X_{99} + X_{125} + X_{151} \tag{231}$$

$$+ X_{177} + X_{203} + X_{229} + X_{255} \quad = +16 \quad \text{(B21)} \tag{232}$$

$$X_{22} + X_{48} + X_{74} + X_{100} + X_{126} + X_{152} \tag{233}$$

$$+ X_{178} + X_{204} + X_{230} + X_{256} \quad = +33 \quad \text{(B22)} \tag{234}$$

$$X_{23} + X_{49} + X_{75} + X_{101} + X_{127} + X_{153} \tag{235}$$

$$+ X_{179} + X_{205} + X_{231} + X_{257} \quad = +4 \quad \text{(B23)} \tag{236}$$

$$X_{24} + X_{50} + X_{76} + X_{102} + X_{128} + X_{154} \tag{237}$$

$$+ X_{180} + X_{206} + X_{232} + X_{258} \quad = +6 \quad \text{(B24)} \tag{238}$$

$$X_{25} + X_{51} + X_{77} + X_{103} + X_{129} + X_{155} \tag{239}$$

$$+ X_{181} + X_{207} + X_{233} + X_{259} \quad = +3 \quad \text{(B25)} \tag{240}$$

$$\tag{241}$$

## 3.2 不等式约束 (276 个)

$$X_0 - 21Y_0 \leq +0 \quad \text{(G0)} \tag{242}$$

$$X_1 - 8Y_1 \leq +0 \quad \text{(G1)} \tag{243}$$

$$X_2 - 14Y_2 \leq +0 \quad \text{(G2)} \tag{244}$$

$$X_3 - 10Y_3 \leq +0 \quad \text{(G3)} \tag{245}$$

$$X_4 - 11Y_4 \leq +0 \quad \text{(G4)} \tag{246}$$

$$X_5 - 19Y_5 \leq +0 \quad \text{(G5)} \tag{247}$$

$$X_6 - 3Y_6 \leq +0 \quad \text{(G6)} \tag{248}$$

$$X_7 - 6Y_7 \leq +0 \quad \text{(G7)} \tag{249}$$

$$X_8 - 2Y_8 \leq +0 \quad \text{(G8)} \tag{250}$$

$$X_9 - 7Y_9 \leq +0 \quad \text{(G9)} \tag{251}$$

$$X_{10} - 29Y_{10} \leq +0 \quad \text{(G10)} \tag{252}$$

$$X_{11} - 56Y_{11} \leq +0 \quad \text{(G11)} \tag{253}$$

$$X_{12} - 4Y_{12} \leq +0 \quad \text{(G12)} \tag{254}$$

$$X_{13} - 6Y_{13} \leq +0 \quad \text{(G13)} \tag{255}$$

$$X_{14} - 27Y_{14} \leq +0 \quad \text{(G14)} \tag{256}$$

$$X_{15} - 2Y_{15} \leq +0 \quad \text{(G15)} \tag{257}$$

$$X_{16} - 8Y_{16} \leq +0 \tag{G16}$$ (258)

$$X_{17} - 8Y_{17} \leq +0 \tag{G17}$$ (259)

$$X_{18} - 30Y_{18} \leq +0 \tag{G18}$$ (260)

$$X_{19} - 11Y_{19} \leq +0 \tag{G19}$$ (261)

$$X_{20} - 6Y_{20} \leq +0 \tag{G20}$$ (262)

$$X_{21} - 16Y_{21} \leq +0 \tag{G21}$$ (263)

$$X_{22} - 33Y_{22} \leq +0 \tag{G22}$$ (264)

$$X_{23} - 4Y_{23} \leq +0 \tag{G23}$$ (265)

$$X_{24} - 6Y_{24} \leq +0 \tag{G24}$$ (266)

$$X_{25} - 3Y_{25} \leq +0 \tag{G25}$$ (267)

$$X_{26} - 21Y_{26} \leq +0 \tag{G26}$$ (268)

$$X_{27} - 8Y_{27} \leq +0 \tag{G27}$$ (269)

$$X_{28} - 14Y_{28} \leq +0 \tag{G28}$$ (270)

$$X_{29} - 10Y_{29} \leq +0 \tag{G29}$$ (271)

$$X_{30} - 11Y_{30} \leq +0 \tag{G30}$$ (272)

$$X_{31} - 19Y_{31} \leq +0 \tag{G31}$$ (273)

$$X_{32} - 3Y_{32} \leq +0 \tag{G32}$$ (274)

$$X_{33} - 6Y_{33} \leq +0 \tag{G33}$$ (275)

$$X_{34} - 2Y_{34} \leq +0 \tag{G34}$$ (276)

$$X_{35} - 7Y_{35} \leq +0 \tag{G35}$$ (277)

$$X_{36} - 29Y_{36} \leq +0 \tag{G36}$$ (278)

$$X_{37} - 31Y_{37} \leq +0 \tag{G37}$$ (279)

$$X_{38} - 4Y_{38} \leq +0 \tag{G38}$$ (280)

$$X_{39} - 6Y_{39} \leq +0 \tag{G39}$$ (281)

$$X_{40} - 27Y_{40} \leq +0 \tag{G40}$$ (282)

$$X_{41} - 2Y_{41} \leq +0 \tag{G41}$$ (283)

$$X_{42} - 8Y_{42} \leq +0 \tag{G42}$$ (284)

$$X_{43} - 8Y_{43} \leq +0 \tag{G43}$$ (285)

$$X_{44} - 30Y_{44} \leq +0 \tag{G44}$$ (286)

$$X_{45} - 11Y_{45} \leq +0 \tag{G45}$$ (287)

$$X_{46} - 6Y_{46} \leq +0 \tag{G46}$$ (288)

$$X_{47} - 16Y_{47} \leq +0 \tag{G47}$$ (289)

$$X_{48} - 31Y_{48} \leq +0 \tag{G48}$$ (290)

$$X_{49} - 4Y_{49} \leq +0 \tag{G49}$$ (291)

$$X_{50} - 6Y_{50} \leq +0 \tag{G50}$$ (292)

$$X_{51} - 3Y_{51} \leq +0 \tag{G51}$$ (293)

$$X_{52} - 21Y_{52} \leq +0 \tag{G52}$$ (294)

$$X_{53} - 8Y_{53} \leq +0 \tag{G53}$$ (295)

$$X_{54} - 14Y_{54} \leq +0 \tag{G54}$$ (296)

$$X_{55} - 10Y_{55} \leq +0 \tag{G55}$$ (297)

$$X_{56} - 11Y_{56} \leq +0 \tag{G56}$$ (298)

$$X_{57} - 19Y_{57} \leq +0 \tag{G57}$$ (299)

$$X_{58} - 3Y_{58} \leq +0 \tag{G58}$$ (300)

$$X_{59} - 6Y_{59} \leq +0 \tag{G59}$$ (301)

$$X_{60} - 2Y_{60} \leq +0 \tag{G60}$$ (302)

$$X_{61} - 7Y_{61} \leq +0 \tag{G61}$$ (303)

$$X_{62} - 29Y_{62} \leq +0 \tag{G62}$$ (304)

$$X_{63} - 29Y_{63} \leq +0 \tag{G63}$$ (305)

$$X_{64} - 4Y_{64} \leq +0 \tag{G64}$$ (306)

$$X_{65} - 6Y_{65} \leq +0 \tag{G65}$$ (307)

$$X_{66} - 27Y_{66} \leq +0 \tag{G66}$$ (308)

$$X_{67} - 2Y_{67} \leq +0 \tag{G67}$$ (309)

$$X_{68} - 8Y_{68} \leq +0 \tag{G68}$$ (310)

$$X_{69} - 8Y_{69} \leq +0 \tag{G69}$$ (311)

$$X_{70} - 29Y_{70} \leq +0 \tag{G70}$$ (312)

$$X_{71} - 11Y_{71} \leq +0 \tag{G71}$$ (313)

$$X_{72} - 6Y_{72} \leq +0 \tag{G72}$$ (314)

$$X_{73} - 16Y_{73} \leq +0 \tag{G73}$$ (315)

$$X_{74} - 29Y_{74} \leq +0 \tag{G74}$$ (316)

$$X_{75} - 4Y_{75} \leq +0 \tag{G75}$$ (317)

$$X_{76} - 6Y_{76} \leq +0 \tag{G76}$$ (318)

$$X_{77} - 3Y_{77} \leq +0 \tag{G77}$$ (319)

$$X_{78} - 21Y_{78} \leq +0 \tag{G78}$$ (320)

$$X_{79} - 8Y_{79} \leq +0 \tag{G79}$$ (321)

$$X_{80} - 14Y_{80} \leq +0 \tag{G80}$$ (322)

$$X_{81} - 10Y_{81} \leq +0 \tag{G81}$$ (323)

$$X_{82} - 11Y_{82} \leq +0 \tag{G82}$$ (324)

$$X_{83} - 19Y_{83} \leq +0 \tag{G83}$$ (325)

$$X_{84} - 3Y_{84} \leq +0 \tag{G84}$$ (326)

$$X_{85} - 6Y_{85} \leq +0 \tag{G85}$$ (327)

$$X_{86} - 2Y_{86} \leq +0 \tag{G86}$$ (328)

$$X_{87} - 7Y_{87} \leq +0 \tag{G87}$$ (329)

$$X_{88} - 25Y_{88} \leq +0 \tag{G88}$$ (330)

$$X_{89} - 25Y_{89} \leq +0 \tag{G89}$$ (331)

$$X_{90} - 4Y_{90} \leq +0 \tag{G90}$$ (332)

$$X_{91} - 6Y_{91} \leq +0 \tag{G91}$$ (333)

$$X_{92} - 25Y_{92} \leq +0 \tag{G92}$$ (334)

$$X_{93} - 2Y_{93} \leq +0 \tag{G93}$$ (335)

$$X_{94} - 8Y_{94} \leq +0 \tag{G94}$$ (336)

$$X_{95} - 8Y_{95} \leq +0 \tag{G95}$$ (337)

$$X_{96} - 25Y_{96} \leq +0 \tag{G96}$$ (338)

$$X_{97} - 11Y_{97} \leq +0 \tag{G97}$$ (339)

$$X_{98} - 6Y_{98} \leq +0 \tag{G98}$$ (340)

$$X_{99} - 16Y_{99} \leq +0 \tag{G99}$$ (341)

$$X_{100} - 25Y_{100} \leq +0 \tag{G100} \tag{342}$$

$$X_{101} - 4Y_{101} \leq +0 \tag{G101} \tag{343}$$

$$X_{102} - 6Y_{102} \leq +0 \tag{G102} \tag{344}$$

$$X_{103} - 3Y_{103} \leq +0 \tag{G103} \tag{345}$$

$$X_{104} - 21Y_{104} \leq +0 \tag{G104} \tag{346}$$

$$X_{105} - 8Y_{105} \leq +0 \tag{G105} \tag{347}$$

$$X_{106} - 14Y_{106} \leq +0 \tag{G106} \tag{348}$$

$$X_{107} - 10Y_{107} \leq +0 \tag{G107} \tag{349}$$

$$X_{108} - 11Y_{108} \leq +0 \tag{G108} \tag{350}$$

$$X_{109} - 19Y_{109} \leq +0 \tag{G109} \tag{351}$$

$$X_{110} - 3Y_{110} \leq +0 \tag{G110} \tag{352}$$

$$X_{111} - 6Y_{111} \leq +0 \tag{G111} \tag{353}$$

$$X_{112} - 2Y_{112} \leq +0 \tag{G112} \tag{354}$$

$$X_{113} - 7Y_{113} \leq +0 \tag{G113} \tag{355}$$

$$X_{114} - 21Y_{114} \leq +0 \tag{G114} \tag{356}$$

$$X_{115} - 21Y_{115} \leq +0 \tag{G115} \tag{357}$$

$$X_{116} - 4Y_{116} \leq +0 \tag{G116} \tag{358}$$

$$X_{117} - 6Y_{117} \leq +0 \tag{G117} \tag{359}$$

$$X_{118} - 21Y_{118} \leq +0 \tag{G118} \tag{360}$$

$$X_{119} - 2Y_{119} \leq +0 \tag{G119} \tag{361}$$

$$X_{120} - 8Y_{120} \leq +0 \tag{G120} \tag{362}$$

$$X_{121} - 8Y_{121} \leq +0 \tag{G121} \tag{363}$$

$$X_{122} - 21Y_{122} \leq +0 \tag{G122} \tag{364}$$

$$X_{123} - 11Y_{123} \leq +0 \tag{G123} \tag{365}$$

$$X_{124} - 6Y_{124} \leq +0 \tag{G124} \tag{366}$$

$$X_{125} - 16Y_{125} \leq +0 \tag{G125} \tag{367}$$

$$X_{126} - 21Y_{126} \leq +0 \tag{G126} \tag{368}$$

$$X_{127} - 4Y_{127} \leq +0 \tag{G127} \tag{369}$$

$$X_{128} - 6Y_{128} \leq +0 \tag{G128} \tag{370}$$

$$X_{129} - 3Y_{129} \leq +0 \tag{G129} \tag{371}$$

$$X_{130} - 21Y_{130} \leq +0 \tag{G130} \tag{372}$$

$$X_{131} - 8Y_{131} \leq +0 \tag{G131} \tag{373}$$

$$X_{132} - 14Y_{132} \leq +0 \tag{G132} \tag{374}$$

$$X_{133} - 10Y_{133} \leq +0 \tag{G133} \tag{375}$$

$$X_{134} - 11Y_{134} \leq +0 \tag{G134} \tag{376}$$

$$X_{135} - 19Y_{135} \leq +0 \tag{G135} \tag{377}$$

$$X_{136} - 3Y_{136} \leq +0 \tag{G136} \tag{378}$$

$$X_{137} - 6Y_{137} \leq +0 \tag{G137} \tag{379}$$

$$X_{138} - 2Y_{138} \leq +0 \tag{G138} \tag{380}$$

$$X_{139} - 7Y_{139} \leq +0 \tag{G139} \tag{381}$$

$$X_{140} - 29Y_{140} \leq +0 \tag{G140} \tag{382}$$

$$X_{141} - 43Y_{141} \leq +0 \tag{G141} \tag{383}$$

$$X_{142} - 4Y_{142} \leq +0 \qquad \text{(G142)} \qquad (384)$$

$$X_{143} - 6Y_{143} \leq +0 \qquad \text{(G143)} \qquad (385)$$

$$X_{144} - 27Y_{144} \leq +0 \qquad \text{(G144)} \qquad (386)$$

$$X_{145} - 2Y_{145} \leq +0 \qquad \text{(G145)} \qquad (387)$$

$$X_{146} - 8Y_{146} \leq +0 \qquad \text{(G146)} \qquad (388)$$

$$X_{147} - 8Y_{147} \leq +0 \qquad \text{(G147)} \qquad (389)$$

$$X_{148} - 30Y_{148} \leq +0 \qquad \text{(G148)} \qquad (390)$$

$$X_{149} - 11Y_{149} \leq +0 \qquad \text{(G149)} \qquad (391)$$

$$X_{150} - 6Y_{150} \leq +0 \qquad \text{(G150)} \qquad (392)$$

$$X_{151} - 16Y_{151} \leq +0 \qquad \text{(G151)} \qquad (393)$$

$$X_{152} - 33Y_{152} \leq +0 \qquad \text{(G152)} \qquad (394)$$

$$X_{153} - 4Y_{153} \leq +0 \qquad \text{(G153)} \qquad (395)$$

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$$X_{160} - 11Y_{160} \leq +0 \qquad \text{(G160)} \qquad (402)$$

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$$X_{166} - 11Y_{166} \leq +0 \qquad \text{(G166)} \qquad (408)$$

$$X_{167} - 11Y_{167} \leq +0 \qquad \text{(G167)} \qquad (409)$$

$$X_{168} - 4Y_{168} \leq +0 \qquad \text{(G168)} \qquad (410)$$

$$X_{169} - 6Y_{169} \leq +0 \qquad \text{(G169)} \qquad (411)$$

$$X_{170} - 11Y_{170} \leq +0 \qquad \text{(G170)} \qquad (412)$$

$$X_{171} - 2Y_{171} \leq +0 \qquad \text{(G171)} \qquad (413)$$

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$$X_{175} - 11Y_{175} \leq +0 \qquad \text{(G175)} \qquad (417)$$

$$X_{176} - 6Y_{176} \leq +0 \qquad \text{(G176)} \qquad (418)$$

$$X_{177} - 11Y_{177} \leq +0 \qquad \text{(G177)} \qquad (419)$$

$$X_{178} - 11Y_{178} \leq +0 \qquad \text{(G178)} \qquad (420)$$

$$X_{179} - 4Y_{179} \leq +0 \qquad \text{(G179)} \qquad (421)$$

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$$X_{181} - 3Y_{181} \leq +0 \qquad \text{(G181)} \qquad (423)$$

$$X_{182} - 21Y_{182} \leq +0 \qquad \text{(G182)} \qquad (424)$$

$$X_{183} - 8Y_{183} \leq +0 \qquad \text{(G183)} \qquad (425)$$

$$X_{184} - 14Y_{184} \leq +0 \qquad \text{(G184)} \qquad (426)$$

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$$X_{191} - 7Y_{191} \leq +0 \qquad \text{(G191)} \qquad (433)$$

$$X_{192} - 29Y_{192} \leq +0 \qquad \text{(G192)} \qquad (434)$$

$$X_{193} - 54Y_{193} \leq +0 \qquad \text{(G193)} \qquad (435)$$

$$X_{194} - 4Y_{194} \leq +0 \qquad \text{(G194)} \qquad (436)$$

$$X_{195} - 6Y_{195} \leq +0 \qquad \text{(G195)} \qquad (437)$$

$$X_{196} - 27Y_{196} \leq +0 \qquad \text{(G196)} \qquad (438)$$

$$X_{197} - 2Y_{197} \leq +0 \qquad \text{(G197)} \qquad (439)$$

$$X_{198} - 8Y_{198} \leq +0 \qquad \text{(G198)} \qquad (440)$$

$$X_{199} - 8Y_{199} \leq +0 \qquad \text{(G199)} \qquad (441)$$

$$X_{200} - 30Y_{200} \leq +0 \qquad \text{(G200)} \qquad (442)$$

$$X_{201} - 11Y_{201} \leq +0 \qquad \text{(G201)} \qquad (443)$$

$$X_{202} - 6Y_{202} \leq +0 \qquad \text{(G202)} \qquad (444)$$

$$X_{203} - 16Y_{203} \leq +0 \qquad \text{(G203)} \qquad (445)$$

$$X_{204} - 33Y_{204} \leq +0 \qquad \text{(G204)} \qquad (446)$$

$$X_{205} - 4Y_{205} \leq +0 \qquad \text{(G205)} \qquad (447)$$

$$X_{206} - 6Y_{206} \leq +0 \qquad \text{(G206)} \qquad (448)$$

$$X_{207} - 3Y_{207} \leq +0 \qquad \text{(G207)} \qquad (449)$$

$$X_{208} - 18Y_{208} \leq +0 \qquad \text{(G208)} \qquad (450)$$

$$X_{209} - 8Y_{209} \leq +0 \qquad \text{(G209)} \qquad (451)$$

$$X_{210} - 14Y_{210} \leq +0 \qquad \text{(G210)} \qquad (452)$$

$$X_{211} - 10Y_{211} \leq +0 \qquad \text{(G211)} \qquad (453)$$

$$X_{212} - 11Y_{212} \leq +0 \qquad \text{(G212)} \qquad (454)$$

$$X_{213} - 18Y_{213} \leq +0 \qquad \text{(G213)} \qquad (455)$$

$$X_{214} - 3Y_{214} \leq +0 \qquad \text{(G214)} \qquad (456)$$

$$X_{215} - 6Y_{215} \leq +0 \qquad \text{(G215)} \qquad (457)$$

$$X_{216} - 2Y_{216} \leq +0 \qquad \text{(G216)} \qquad (458)$$

$$X_{217} - 7Y_{217} \leq +0 \qquad \text{(G217)} \qquad (459)$$

$$X_{218} - 18Y_{218} \leq +0 \qquad \text{(G218)} \qquad (460)$$

$$X_{219} - 18Y_{219} \leq +0 \qquad \text{(G219)} \qquad (461)$$

$$X_{220} - 4Y_{220} \leq +0 \qquad \text{(G220)} \qquad (462)$$

$$X_{221} - 6Y_{221} \leq +0 \qquad \text{(G221)} \qquad (463)$$

$$X_{222} - 18Y_{222} \leq +0 \qquad \text{(G222)} \qquad (464)$$

$$X_{223} - 2Y_{223} \leq +0 \qquad \text{(G223)} \qquad (465)$$

$$X_{224} - 8Y_{224} \leq +0 \qquad \text{(G224)} \qquad (466)$$

$$X_{225} - 8Y_{225} \leq +0 \qquad \text{(G225)} \qquad (467)$$

$$X_{226} - 18Y_{226} \leq +0 \qquad \text{(G226)} \qquad (468)$$

$$X_{227} - 11Y_{227} \leq +0 \qquad \text{(G227)} \qquad (469)$$

$$X_{228} - 6Y_{228} \leq +0 \qquad \text{(G228)} \qquad (470)$$

$$X_{229} - 16Y_{229} \leq +0 \qquad \text{(G229)} \qquad (471)$$

$$X_{230} - 18Y_{230} \leq +0 \qquad \text{(G230)} \qquad (472)$$

$$X_{231} - 4Y_{231} \leq +0 \qquad \text{(G231)} \qquad (473)$$

$$X_{232} - 6Y_{232} \leq +0 \qquad \text{(G232)} \qquad (474)$$

$$X_{233} - 3Y_{233} \leq +0 \qquad \text{(G233)} \qquad (475)$$

$$X_{234} - 21Y_{234} \leq +0 \qquad \text{(G234)} \qquad (476)$$

$$X_{235} - 8Y_{235} \leq +0 \qquad \text{(G235)} \qquad (477)$$

$$X_{236} - 14Y_{236} \leq +0 \qquad \text{(G236)} \qquad (478)$$

$$X_{237} - 10Y_{237} \leq +0 \qquad \text{(G237)} \qquad (479)$$

$$X_{238} - 11Y_{238} \leq +0 \qquad \text{(G238)} \qquad (480)$$

$$X_{239} - 19Y_{239} \leq +0 \qquad \text{(G239)} \qquad (481)$$

$$X_{240} - 3Y_{240} \leq +0 \qquad \text{(G240)} \qquad (482)$$

$$X_{241} - 6Y_{241} \leq +0 \qquad \text{(G241)} \qquad (483)$$

$$X_{242} - 2Y_{242} \leq +0 \qquad \text{(G242)} \qquad (484)$$

$$X_{243} - 7Y_{243} \leq +0 \qquad \text{(G243)} \qquad (485)$$

$$X_{244} - 29Y_{244} \leq +0 \qquad \text{(G244)} \qquad (486)$$

$$X_{245} - 56Y_{245} \leq +0 \qquad \text{(G245)} \qquad (487)$$

$$X_{246} - 4Y_{246} \leq +0 \qquad \text{(G246)} \qquad (488)$$

$$X_{247} - 6Y_{247} \leq +0 \qquad \text{(G247)} \qquad (489)$$

$$X_{248} - 27Y_{248} \leq +0 \qquad \text{(G248)} \qquad (490)$$

$$X_{249} - 2Y_{249} \leq +0 \qquad \text{(G249)} \qquad (491)$$

$$X_{250} - 8Y_{250} \leq +0 \qquad \text{(G250)} \qquad (492)$$

$$X_{251} - 8Y_{251} \leq +0 \qquad \text{(G251)} \qquad (493)$$

$$X_{252} - 30Y_{252} \leq +0 \qquad \text{(G252)} \qquad (494)$$

$$X_{253} - 11Y_{253} \leq +0 \qquad \text{(G253)} \qquad (495)$$

$$X_{254} - 6Y_{254} \leq +0 \qquad \text{(G254)} \qquad (496)$$

$$X_{255} - 16Y_{255} \leq +0 \qquad \text{(G255)} \qquad (497)$$

$$X_{256} - 33Y_{256} \leq +0 \qquad \text{(G256)} \qquad (498)$$

$$X_{257} - 4Y_{257} \leq +0 \qquad \text{(G257)} \qquad (499)$$

$$X_{258} - 6Y_{258} \leq +0 \qquad \text{(G258)} \qquad (500)$$

$$X_{259} - 3Y_{259} \leq +0 \qquad \text{(G259)} \qquad (501)$$

$$(502)$$

# 4 变量定义

## 4.1 二元变量 (260 个)

$$Y_i \in \{0,1\}, \quad i \in \{0,1,2,\ldots,259\} \qquad (503)$$

**二元变量示例** (显示前 50 个, 共 260 个):

$Y_{258}, Y_0, Y_1, Y_2, Y_3, Y_4, Y_5, Y_6, Y_7, Y_8,$

$Y_9, Y_{10}, Y_{11}, Y_{12}, Y_{13}, Y_{14}, Y_{15}, Y_{16}, Y_{17}, Y_{18},$

$Y_{19}, Y_{20}, Y_{21}, Y_{22}, Y_{23}, Y_{24}, Y_{25}, Y_{26}, Y_{27}, Y_{28},$

$Y_{29}, Y_{30}, Y_{31}, Y_{32}, Y_{33}, Y_{34}, Y_{35}, Y_{36}, Y_{37}, Y_{38},$

$Y_{39}, Y_{40}, Y_{41}, Y_{42}, Y_{43}, Y_{44}, Y_{45}, Y_{46}, Y_{47}, Y_{48}$

*... 还有 210 个二元变量*

## 4.2 连续变量 (260 个)

所有连续变量均为非负实数:

$$X_j \geq 0, \quad j \in \{0, 1, 2, \ldots, 259\} \tag{504}$$

**连续变量说明:** 模型包含 260 个连续决策变量，所有变量的取值范围均为非负实数域。