Example: Crew Scheduling

Set up the Crew Scheduling model in Excel:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV
1	**Crew Scheduling**																																																
2																																																
3	Worker Satisfaction	=sumproduct(E7:E24,B7:B24)																																														
4																																																
5																																																
6		Weights	Sch Limit	Sch Limit Targets	Variables																																											
7	Bob	1	=sum(E7:E9)	1			1	1	1	1	1			1	1		1	1	1																													
8		4					1	1	1	1	1																			1	1		1	1	1												
9		5																			1	1	1	1	1																			1	1	1	1	1		
10	Bill	3	=sum(E10:E12)	1					1	1	1	1	1																		1	1	1	1	1													
11		3														1	1	1	1	1			1	1	1	1	1																					
12		4																																			1	1	1	1	1			1	1	1	1	1
13	Joe	6	=sum(E13:E15)	1																																	1	1		1	1	1	1	1			1	1	1
14		3																									1	1			1	1	1	1	1			1	1	1							
15		1																			1	1		1	1	1	1	1			1	1	1															
16	Sylvia	1	=sum(E16:E18)	1																	1	1	1	1		1																			1	1	1	1			1
17		5					1	1	1	1			1														1	1	1	1			1															
18		4												1	1	1	1			1	1	1	1	1		1																						
19	Joann	2	=sum(E19:E21)	1				1	1	1	1	1			1	1	1	1	1																													
20		2																				1	1	1	1	1			1	1	1	1	1															
21		6																																		1	1	1	1	1			1	1	1	1	1	
22	Mary	3	=sum(E22:E24)	1			1	1	1			1	1																	1	1	1			1	1												
23		6																																		1	1	1		1	1	1	1	1			1	1
24		1																			1	1	1		1	1	1	1	1			1	1														
25																																															
26				Number working		=sumproduct($E7:$E24,G7:G24) →																																										
27													>= …																																			
28				Requirements			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Proposed Two-Week Schedules

Day shift | **Evening shift** | **Night shift**

Max B3 By changing E7:E24
Constraints: E7:E24=binary, C7:C24=D7:D24, G26:AV26>=G28:AV28
Nonnegativity: doesn't matter
Method: SimplexLP

Example: Crew Scheduling

Solver Solution:

Crew Scheduling

Worker Satisfaction	26			

Proposed Two-Week Schedules

					Day shift												Evening shift												Night shift											
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Weights	Sch Limit	Sch Limit Targets	Variables																																								
Bob	1	1	1	0	1	1	1	1	1			1	1	1	1	1																												
	4			1	1	1	1	1	1																	1	1	1	1	1														
	5			0															1	1	1	1	1																	1	1	1	1	1		
Bill	3	1	1	0			1	1	1	1	1															1	1	1	1	1															
	3			1										1	1	1	1	1			1	1	1	1	1																				
	4			0																													1	1	1	1	1			1	1	1	1	1
Joe	6	1	1	1																											1	1		1	1	1	1	1			1	1	1		
	3			0																					1	1			1	1	1	1		1	1	1							
	1			0															1	1		1	1	1	1	1			1	1	1													
Sylvia	1	1	1	0															1	1	1	1		1															1	1	1	1			1
	5			0	1	1	1	1			1														1	1	1	1			1													
	4			1								1	1	1	1			1	1	1	1	1		1																				
Joann	2	1	1	0		1	1	1	1	1			1	1	1	1	1																												
	2			0																1	1	1	1	1			1	1	1	1	1													
	6			1																												1	1	1	1	1			1	1	1	1	1	
Mary	3	1	1	1	1	1	1			1	1															1	1	1			1	1													
	6			0																											1	1	1			1	1	1	1	1			1	1
	1			0															1	1	1			1	1	1			1	1														
			Number working		2	2	2	1	1	1	1	1	1	2	2	1	1	2	1	1	2	2	1	1	2	2	2	2	1	1	1	1	1	2	1	1	2	2	1	1	2	1	1	2	2	1
					>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=	>=
			Requirements		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1