**Example: Crew Scheduling** 

**Set up the Crew Scheduling model in Excel:** 

4	A	В	С	D	Е	F G	Н	IJ	ΚĮ	M	N C	) P	Q	R	S	T	U	٧	W)	Y	ZA	VΑ	EAC	AD	ΑE	AF	AC	3 Al	H AI	AJ.	A۲A	LAI	AN	ACA	AFA(	AR	AS	AT	AU	AV
1	Crew Scheduling																																							
2																																								
3	Worker Satisfaction																	P	rop	ose	d T	wo	-W	eek	Sc	hed	ule	es												
4						Г				D	ay s	shif	t				Τ				Ev	en	ing	shi	ft				Τ				]	Nię	ght :	shif	t			
5						1	2	3 4	5 6	5 7	8 9	10	11	12	2 13	3 14	1	2	3 4	1 5	6	7 8	9	10	11	12	13	3 1	4 1	2	3	4 5	6	7	8 9	10	11	12	13	14
6		Weights	Sch Limit	Sch Limit Targets	Variables	Г											Т												Т											
7	Bob	1				1	1	1 1	1		1 1	1	1 1	1	l																									
8		4				1	1	1 1	1													1	1	1	1	1														
9		5															1	1	1 1	1 1															1 1	1	1	1		
10	Bill	. 3						1 1	1 1	1 1														1	1	1	1	1	1											
11		3										1	1 1	l 1	l 1	1 1	ı		1	1 1	1	1																		
12		4																													1	1 1	1	1		1	1	1	1	. 1
13	Joe	6																											1	1		1	1	1	1 1			1	1	. 1
14		3																				1	1			1	1	1	1 1	1		1	1	1						
15		1															1	1		1	1	1 1	1			1	1	1	1											
16	Sylvia	. 1															1	1	1	l	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	l		1	1	1	1	l	1	1																		
19		. 2	,				1	1 1	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	i																											1	1	1 1	1		1	1	1	1	1	
22 23	Mary	3				1	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	l	1											
24 25 26 27 28																																								
26				Number working																																				
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	1	1	. 1	. 1

## **Example: Crew Scheduling**

## **Solver Solution:**

Α	В	С	D	E F	G	HI	J	K L	I M	N O	Р	Q	R	S	T	UV	/ W	X	/ Z	A/A	EAC	AD	AE	AF	AG	4H /	AΙΑ	JAI	AL/	NΑ	AC	AFA	(Al	R AS	AT	Al	J A
Crew Scheduling																																					
Worker Satisfaction	26				Г											I	Prop	os	ed 7	Γwο	-W	eek	Scl	hedi	ıles												
					Г				Da	ay sl	hift				Т				E	ven	ing	shi	ft			Т					N	ght	shi	ft			
					1	2 3	4	5 6	7	8 9	10	11	12	13	14	1 2	2 3	4 5						12	13	14	1 2	2 3	4	5 6	7	8 9	1	) 11	12	2 13	1
	Weights	Sch Limit	Sch Limit Targets	Variables	Г										Т											Т				Т							Т
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	1													Т
	5			0	П											1 1	1	1	l													1 1	l	1 1	1	L	
Bill	3	1	. 1	0	П	1	1	1 1	1													1	1	1	1	1											
	3			1							1	1	1	1	1		1	1	1	1																	
	4			0																								1	1	1 1	1			1 1	. 1	1 !	L
Joe	6	1	. 1	1	П																						1 1	l		1 1	1	1 1	l		1	1 !	ī
	3			0																1	1 1			1	1	1	1 1	l		1 1	1						
	1			0												1 1		1	1	1 1	1 1			1	1	1											
Sylvia	1	1	. 1	0												1 1	1	1		1												1 1	l	1 1	ı		
	5			0	1	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												
	6			1																							1	1	1	1 1		1	1	1 1	. 1	L 1	Ĺ
Mary	3	1	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	L :
	1			0											$\perp$	1 1	1		1	1 1	1 1	1			1	1											
																														$\Box$							
			Number working		2	2 2	1	1 1	1	1 1	2	2	1	1	2	1 1	2	2	1	2 2	2 2	2	1	1	1	1	1 2	2 1	1	2 2	1	1 2	2	1 1	2	2 1	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	l	1 1	1	1 !	(
	Crew Scheduling  Worker Satisfaction  Bob  Bill  Joe  Sylvia  Joann	Weights   Satisfaction   26   Weights	Weights   Sch Limit	Worker Satisfaction         26           Weights         Sch Limit         Sch Limit Targets           Bob         1         1         1           4         5         1         1         1           Bill         3         1         1         1           Joe         6         1         1         1         1           Sylvia         1 <td>Worker Satisfaction         26           Weights         Sch Limit         Sch Limit Targets         Variables           Bob         1         1         0           4         1         1         0           Bill         3         1         1         0           Joe         6         1         1         1         1           Sylvia         1         1         1         0         0         1         0         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         0         1         0         1         0         0         1         0         0         1         0         0         0         1         0         &lt;</td> <td>Crew Scheduling         26           Worker Satisfaction         26           Weights         Sch Limit           Bob         1           4         1           5         0           Bill         3           3         1           4         0           Joe         6           1         1           2         0           3         0           1         1           3         0           1         0           2         0           4         1           1         0           5         0           1         0           2         0           4         1           1         0           2         0           6         1           1         0           1         0           1         0           2         0           4         1           1         1           1         0           2         0           3         1</td> <td>Crew Scheduling       26         Worker Satisfaction       26         Weights       Sch Limit       Sch Limit Targets       Variables         Bob       1</td> <td>Crew Scheduling         Worker Satisfaction       26         Weights       Sch Limit         Bob       1         1       1         1       1         1       1         1       1         1       1         1       1         1       1         1       1         2       1         3       1         4       0         3       0         1       1         1       1         2       1         3       0         4       0         3       0         4       0         3       0         4       0         5       0         1       1         1       1         2       0         4       0         1       1         2       1         3       1         4       1         4       1         4       1         4       1         5</td> <td>  Worker Satisfaction   26                                  </td> <td>Crew Scheduling         26         Sch Limit Targets         Variables         Diamond         1         2         3         4         5         6         7           Bob         1         <td< td=""><td>  Crew Scheduling</td><td>Crew Scheduling         26         Sch Limit Targets         Variables         Day shift           Weights         Sch Limit         Sch Limit Targets         Variables         1 2 3 4 5 6 7 8 9 10           Bob         1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>  Crew Scheduling</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Morker Satisfaction   26                                  </td><td>  Worker Satisfaction   Z6                                  </td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling   26                                  </td><td>  Crew Scheduling   26   27   28   28   28   28   28   28   28</td><td>Verker Satisfaction</td></td<></td>	Worker Satisfaction         26           Weights         Sch Limit         Sch Limit Targets         Variables           Bob         1         1         0           4         1         1         0           Bill         3         1         1         0           Joe         6         1         1         1         1           Sylvia         1         1         1         0         0         1         0         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         1         0         0         1         0         1         0         0         1         0         0         1         0         0         0         1         0         <	Crew Scheduling         26           Worker Satisfaction         26           Weights         Sch Limit           Bob         1           4         1           5         0           Bill         3           3         1           4         0           Joe         6           1         1           2         0           3         0           1         1           3         0           1         0           2         0           4         1           1         0           5         0           1         0           2         0           4         1           1         0           2         0           6         1           1         0           1         0           1         0           2         0           4         1           1         1           1         0           2         0           3         1	Crew Scheduling       26         Worker Satisfaction       26         Weights       Sch Limit       Sch Limit Targets       Variables         Bob       1	Crew Scheduling         Worker Satisfaction       26         Weights       Sch Limit         Bob       1         1       1         1       1         1       1         1       1         1       1         1       1         1       1         1       1         2       1         3       1         4       0         3       0         1       1         1       1         2       1         3       0         4       0         3       0         4       0         3       0         4       0         5       0         1       1         1       1         2       0         4       0         1       1         2       1         3       1         4       1         4       1         4       1         4       1         5	Worker Satisfaction   26	Crew Scheduling         26         Sch Limit Targets         Variables         Diamond         1         2         3         4         5         6         7           Bob         1 <td< td=""><td>  Crew Scheduling</td><td>Crew Scheduling         26         Sch Limit Targets         Variables         Day shift           Weights         Sch Limit         Sch Limit Targets         Variables         1 2 3 4 5 6 7 8 9 10           Bob         1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>  Crew Scheduling</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling   Crew Sched</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Morker Satisfaction   26                                  </td><td>  Worker Satisfaction   Z6                                  </td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling</td><td>  Crew Scheduling   26                                  </td><td>  Crew Scheduling   26   27   28   28   28   28   28   28   28</td><td>Verker Satisfaction</td></td<>	Crew Scheduling	Crew Scheduling         26         Sch Limit Targets         Variables         Day shift           Weights         Sch Limit         Sch Limit Targets         Variables         1 2 3 4 5 6 7 8 9 10           Bob         1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Crew Scheduling   Crew Sched	Crew Scheduling   Crew Sched	Crew Scheduling   Crew Sched	Crew Scheduling   Crew Sched	Crew Scheduling	Crew Scheduling	Crew Scheduling	Crew Scheduling	Morker Satisfaction   26	Worker Satisfaction   Z6	Crew Scheduling   26	Crew Scheduling   26   27   28   28   28   28   28   28   28	Verker Satisfaction												