User Guide for Editing the Scheduling Excel Files

Warning: Do not change any column, sheet, or file names of the provided excel document, unless specified. This will cause issues within the scheduling program.

Tip: Save a copy of the original Excel documents somewhere safe and don't change them.

- This could be useful when troubleshooting as a reference.

Contents

1. Simple Tips:

1.1 When running the program, all old schedules must be closed!

1.2 Adding an Employee:

- Simply add a new row to every sheet that lists employees. The new staff member should be added to Staff Preferences, week1, and week2 sheets.
- Make sure that they have the appropriate values in each column.

1.3 Changing Staff Availability:

- Change the start and end columns within **week1** and **week2.** Make sure that the hours make sense, otherwise the program may be unable to schedule them.
- **Important Note:** If an employee is not able to work the total number of hours between their min and max weekly hours, you must change their minimum hours in **Staff Preferences**

1.4 Changing Min and Max Hours

- **Important:** If an employee works full time, don't set their minimum hours to 40 hours, instead leave a gap of 5 to 10 hours.
- The model performs better when given a little room to work.

2. Reception Model:

Runtime Note: With the current settings it is taking around 9 minutes running for the program to create a new schedule. This will change as inputs and settings are changed, also depending on the computer it is running on.

- The software is limited to a max runtime of about 40 minutes, so a solution will be found even if it is not perfect.

Program Output:

The program outputs an Excel file with two sheets, each with a schedule for weeks 1 and 2. This includes a column containing the number of scheduled hours for that week as well as 7 columns representing each day of the week. Each employee is assigned shift times and the desk which they work and days off are marked with an "X".

Sample Model Output

	A	B	C	D	E	F	G	H	I
1	**Receptionist**	**Scheduled Hours**	**Sun**	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
2	Sam	40.0	X	small:06:00 AM-04:00 PM	small:06:00 AM-04:00 PM	X	small:06:00 AM-04:00 PM	X	small:07:00 AM-05:00 PM
3	Karissa	40.0	X	large:06:00 AM-06:00 PM	large:04:00 PM-12:00 PM	large:10:00 AM-07:00 PM	large:02:00 PM-07:00 PM	large:09:00 AM-01:00 PM	X
4	Jenny	40.0	X	X	large:06:00 AM-04:00 PM	large:06:00 AM-04:00 PM	large:06:00 AM-04:00 PM	large:06:00 AM-04:00 PM	X
5	Ben	40.0	X	X	small:11:00 AM-08:00 PM	small:11:00 AM-07:00 PM	small:11:00 AM-08:00 PM	small:12:00 PM-08:00 PM	small:11:00 AM-07:00 PM

Sheets: Explanation and Usage

- **requirements**

This sheet is used to decide the hours the desks will be open and how many receptionists will be needed to work at each desk.

Sample Spreadsheet Before Expansion

	A	B	C	D	E	F	G
1	desk	week_open	week_close	weekend_open	weekend_close	min_staff	max_staff
2	small	7	24	8	24	2	5
3	large	7	24	0	0	1	2
4	rad	10	17	0	0	1	2

After expansion, desks can be added to the program by creating new rows

Sample Spreadsheet After Expansion

	A	B	C	D	E	F	G
1	**desk**	**week_open**	**week_close**	**weekend_open**	**weekend_close**	**min_staff**	**max_staff**
2	small	7	17	0	0	2	4
3	large	7	17	0	0	2	4
4	rad	10	17	0	0	2	4
5	er	7	24	7	24	2	4
6	small_special	7	17	0	0	2	4

Columns:

- **week_open & week_close**
  - Used to set the hours which each desk will be open Monday through Friday
  - Take values from 1 to 24, only whole numbers
- **weekend_open & weekend_close**
  - Used to set the hours which each desk will be open Saturday and Sunday
  - Take values from 1 to 24, only whole numbers
- **min_staff & max_staff**
  - Used to set the required number of receptionists for each desk
  - Only whole numbers

- ## week1 & week2

These sheets will be the primary tool used to change the availability of staff. Each person is given a time they are available to start, and end work each day of the week.

- Note: Make sure that each time is entered as a whole number on a 24-hour scale.
  - For example, 8 pm is 20, 2 pm is 14, midnight is 24, etc.
- If a person is not able to work at all, simply enter zeros in both their start and end slot.

Sample Spreadsheet for Reception Availability

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	**name**	**sun_start**	**sun_end**	**mon_start**	**mon_end**	**tue_start**	**tue_end**	**wed_start**	**wed_end**	**thu_start**	**thu_end**	**fri_start**	**fri_end**	**sat_start**	**sat_end**
2	Sam	6	17	6	17	6	17	6	17	6	17	6	17	6	17
3	Karissa	6	19	6	19	6	19	6	19	6	19	6	19	6	19
4	Jenny	6	10	6	10	6	10	6	10	6	10	6	10	6	10

- ## staff_preferences

This sheet is used to change the preferences of each staff member. This includes the number of hours they work each week, their shift lengths, and their desk preference.

Important Note: Once desks are added after the new expansion, columns should be added to allow added preference. They must include "_pref" within the column name

- For example: "er_pref" and "small_special_pref"

Sample Spreadsheet for Reception Staff Preferences

	A	B	C	D	E	F	G	H
1	name	min_hours	max_hours	min_shift_length	max_shift_length	small_pref	large_pref	rad_pref
2	Sam	0	40	10	12	5	1	1
3	Karissa	0	40	3	12	1	5	1
4	Jenny	0	40	10	12	1	5	1
5	Ben	0	40	3	12	6	3	1

Columns:

- **min_hours & max_hours**
  - Ideally, the program should always reach the max number of hours but may not if availability, preferences, etc. do not allow it
  - Should be whole numbers
- **min_shift_length & max_shift_length**
  - Decides how many hours each person works per day they work
  - Should be whole numbers
- **small_pref, large_pref, & rad_pref**
  - A way to include each staff member's desk preferences. Essentially "ranking" each desk on a scale from 0 to 10.
    - A higher number will give more preference to a specific desk.
    - If there is no preference, all columns can be left as 1's

3. ECC (Emergency Critical Care) Model:

Runtime Note: With the current settings it takes around 30 minutes to run for the program to create a new schedule. This will change as inputs and settings are changed, also depending on the computer it is running on.

- The software is limited to a max runtime of about 40 minutes, so a solution will be found even if it is not perfect.

Program Output:

The program outputs an Excel file with two sheets, each with a schedule for weeks 1 and 2. This includes a column containing the number of scheduled hours for that week as well as 7 columns representing each day of the week. Each employee is assigned shift times and the desk which they work and days off are marked with an "X".

Sample Model Output

	A	B	C	D	E	F	G	H	I
1	**Name**	**Total Hours**	**Sun**	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**
2	Melinda	40.0	X	CVT in ER: 12:00 AM-08:00 AM	X	CVT in CCU: 12:00 AM-08:00 AM	CVT in CCU: 12:00 AM-08:00 AM	CVT in CCU: 12:00 AM-08:00 AM	CVT in CCU: 12:00 AM-07:00 AM and 09:00 PM-12:00 AM
3	Peyton	40.0	X	AST in CCU: 07:00 AM-07:00 PM	AST in CCU: 05:00 AM-08:00 AM	AST in CCU: 05:00 AM-08:00 AM	AST in CCU: 05:00 AM-05:00 PM	AST in CCU: 06:00 AM-04:00 PM	X
4	Bridget	40.0	AST in ER: 12:00 AM-01:00 PM	CVT in CCU: 12:00 AM-12:00 PM	AST in CCU: 12:00 AM-11:00 AM	AST in CCU: 12:00 AM-10:00 AM	X	X	X
5	Ali	40.0	CVT in CCU: 11:00 AM-03:00 PM	CVT in CCU: 11:00 AM-08:00 PM	CVT in CCU: 11:00 AM-08:00 PM	X	CVT in CCU: 11:00 AM-08:00 PM	CVT in CCU: 11:00 AM-08:00 PM	X
6	Sara	36.0	X	CVT in CCU: 10:00 AM-03:00 PM	CVT in CCU: 01:00 PM-12:00 AM	X	CVT in CCU: 03:00 PM-12:00 AM	CVT in CCU: 01:00 PM-12:00 AM	X

Sheets: Explanation and Usage

- **requirements**

This sheet is used to decide the hours the night shift begins and ends since CCU and ER are meant to stay open 24/7 and how many veterinary technicians, assistants, and client care liaisons are needed to keep both areas open.

Sample Spreadsheet of ECC Staff Requirements

	A	B	C	D	E	F	G	H	I	J	K
1	**areas**	**min_cvt**	**max_cvt**	**min_ast**	**max_ast**	**min_ccl**	**max_ccl**	**night_shift_start**	**night_shift_end**	**open_start**	**open_end**
2	CCU	2	3	1	3	0	1	22	8	1	24
3	ER	1	3	1	3	0	1	22	8	7	17

Columns:

- **min_cvt & max_cvt**
  - Used to ensure there are enough (and not too many) veterinary technicians in both areas
  - Only whole numbers
- **min_ast & max_ast**
  - Used to ensure there are enough (and not too many) veterinary assistants in both areas
  - Only whole numbers
- **min_ccl & max_ccl**

    - Used to ensure there are enough (and not too many) client care liaisons in both areas
    - Only whole numbers
- **night_shift_start & night_shift_end**
    - Used to set the hours the night shift begins and ends
    - Take values from 1 to 24, only whole numbers
- **open_start & open_end**
    - Used to set the hours which each unit will be open
    - Take values from 1 to 24, only whole numbers

• week1 & week2

These sheets will be the primary tool used to change the availability of staff. Each person is given a time they are available to start, and end work each day of the week.

- Note: Make sure that each time is entered as a whole number on a 24-hour scale.
    - For example, 8 pm is 20, 2 pm is 14, midnight is 24, etc.
- If a person is not able to work at all, simply enter zeros in both their start and end slot.

Sample Spreadsheet of ECC Staff Availability

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	name	sun_start	sun_end	mon_start	mon_end	tue_start	tue_end	wed_start	wed_end	thu_start	thu_end	fri_start	fri_end	sat_start	sat_end
2	Melinda	0	24	0	24	0	24	0	24	0	24	0	24	0	24
3	Peyton	6	19	6	19	6	19	6	19	6	19	6	19	6	19
4	Bridget	6	10	6	10	6	10	6	10	6	10	6	10	6	10
5	Ali	12	20	12	20	12	20	12	20	12	20	12	20	12	20
6	Sara	11	24	11	24	11	24	11	24	11	24	11	24	11	24
7	Emma	9	24	9	24	9	24	9	24	9	24	9	24	9	24
8	Lindsey	7	24	7	24	7	24	7	24	7	24	7	24	7	24

• staff_preferences

This sheet is used to change the preferences of each staff member. This includes the number of hours they work each week, their shift lengths, position, department area and if the staff is willing to work overnight shifts.

Sample Spreadsheet of ECC Staff Preferences

	A	B	C	D	E	F	G	H	I	J
1	name	min_shift_length	max_shift_length	max_hours	role_cvt	role_assistant	role_ccl	area_ccu	area_er	night_pref
2	Melinda	6	13	40	1	1	0	1	1	1
3	Peyton	3	13	40	0	1	0	1	1	0
4	Bridget	10	13	40	0	1	0	1	1	0
5	Ali	3	13	40	1	0	0	1	0	0
6	Sara	3	13	36	1	0	0	1	1	0
7	Emma	5	13	40	0	1	0	1	1	0
8	Lindsey	10	13	30	0	1	0	1	1	0

Columns:

- **min_shift_length & max_shift_length**
    - Decides how many hours each person works per day they work
    - Should be whole numbers
- **min_hours & max_hours**
    - Ideally, the program should always reach the max number of hours but may not if availability, preferences, etc. do not allow it

    - Should be whole numbers
- **role_cvt**
    - Shows if the employee can work as a veterinary technician
    - Use 0 if the employee cannot work as a veterinary technician or 1 if the employee can work as a veterinary technician
- **role_assistant**
    - Shows if the employee can work as an assistant
    - Use 0 if the employee cannot work as an assistant or 1 if the employee can work as an assistant
- **role_ccl**
    - Shows if the employee can work as a client care liaison
    - Use 0 if the employee cannot work as a client care liaison or 1 if the employee can work as a client care liaison
- **area_ccu & area_er**
    - Shows if the employee can work in CCU and ER
    - Use 0 if the employee cannot work in the department (either CCU or ER) or 1 if the employee can work in the department
- **night_pref**
    - A way to include each staff member's night shift preferences
    - Use 0 if the employee cannot work night shifts or 1 if the employee can work night shifts
    - **Note:** This will give heavy preference towards night shifts, so if only a few people have 1's the few who do will likely receive only night shifts.

User Guide for Simple Julia Troubleshooting

How to Spot an Error:

- After initially running the program, a window should pop up and run some code. However, if after a little while the window closes surprisingly and there is no new schedule created, an error has likely occurred.
- Due to the nature of the software provided, this error is likely to be an infeasible model. This means that the parameters within the provided Excel sheets have been changed in such a way that it is impossible to create a schedule.

How to Address Errors:

- The best solution is likely to undo recent changes made to the excel document.
    - If the program worked the last time it was run before changes were made this is almost guaranteed to be the answer.
    - **Primary concerns:** Max/min hours must align with the total hours a staff member is available.
- The next best solution is to look over the Excel spreadsheets and make sure that each entry makes sense and follows the guidelines provided above.
- Although tedious, it may help to refer to the original spreadsheets provided and see if there are any major differences.