Below is an explaination of the preferred functions and components of this software.

1. **Overview of what the system does:**

The software will be used to build a hospital coverage schedule – assigning doctors to particular shifts at particular hospitals. The software needs to be able to collect requests from individual doctors on what days they want off (Vacation or no assignment for other reasons), if they want to work only at certain hospitals, or at particular times of day (i.e. no night shifts).

The software needs to then take the inputs from the users and from the head scheduler and output them in either excel or into a format that the optimization tool/program can use

The software should be accessible from the internet on any type of device (desktop, laptop, mobile phone, tablets).

1. **Graphical User Interface –**

The display is critical. The end user will be using this on desktops, laptops, and mobile devices…and their perception of the system is going to be driven by how it looks and how you navigate through each of the tabs/menus. The end users are doctors and they are far from technically savvy. If a 12 year old can operate this and understand all the aspects of it, then the doctors (most of them over the age of 55) will be able to use it.

The software will be used by Doctors, Doctor Managers (for pay purposes), and the Doctor that is responsible for assigning shifts. The doctors will not be the systems administrators

1. **Login**

System needs to have a secure login

1. **Inputs**
   1. User’s personal preference profile
      1. The profile needs to provide a mechanism to identify:
         1. Ordered preference of which hospitals they’d like to work at
         2. Ordered preference of times they do / do not want to work (ie. No nights)
         3. Which hospital they have credentials/certifications to work at
         4. This is one of two ways the employee doctors can influence where they work
   2. Request Days off
      1. Since the hospitals are covered 24 hours a day for 265 days a week, people have to request weekends, days off, and vacation
      2. Requested days off have to fall into a priority system
         1. Vacation is top priority…theoretically only a few are allowed to take vacation at the same time
         2. People can request a day off - a personal day - (a day not assigned, but not a vacation day)…but this request takes a lower priority than vacation requests)
         3. Need a mechanism to have a day off for admin purposes, training, or conferences
   3. Scheduling Rules
      1. This module needs to be available to generate / list the rules that govern the schedule algorithm
      2. This is not viewable by the user or the scheduler – Internal
      3. System must be structured so we can add rules as they are identified
      4. Typical rules include:
         1. Can’t have two shifts back to back
         2. Can’t have two shifts at the same time
         3. Only one person per block
         4. Neonatologists can fill Neonatologist and Pediatrician positions
         5. Pediatricians can fill Pediatrician positions
         6. Nurse Practicianers can only fill NNP positions
         7. Some personnel cannot work at particular hospitals
            1. The practice covers 10+ hospitals from 3 different networks/corporations.
            2. The head physician (Medical director) at one hospital cannot work at a compeitors hospital as that is a conflict of interest
            3. Not every doctor is able to work at each hospital

One hospital limits the practice to 10 physicians that can work there…so only 10 are credentialed and able to get into the clinic

* 1. Ability to edit and rename sections and variable
     1. The ultimate goal is to build the system and get the local Texas practice to adopt it.
     2. If its successful, other regional practices may adopt it
     3. The terminology and point allocation/structure varies from practice to practice
     4. This is not critical but something to think about incase it grows
  2. Roster of Doctors, NNP, Specialists, Directors
     1. This is the master list of who is eligible to be scheduled
     2. Need a full roster and the ability to add/ delete personnel
     3. Need a mechanism to temporarily disable them for the next round of scheduling due to medical, maternity, or other Leave of Absence
     4. Some doctors are part time…
        1. If Part time, need to be able to designate which %
  3. Position module
     1. The positions staffed vary over the course of the year and evolve as the practice gains new hospitals. The defined positions need to be variable and serves as input for the scheduling tool
     2. Each position needs to defined by:
        1. Hospital covered
        2. Shifts available
           1. Day
           2. Night
           3. Backup
        3. Times of each shift
        4. Each position needs to be designated a specific qualification
           1. Some are Neonatologists
           2. Some positions are Pediatricians
           3. Some are NNPs
     3. The positions to be staffed/assigned needs to be variable
  4. Point Allocation
     1. The doctors are paid based upon the number of points that they accumulate…
     2. Points vary between location and time and duration.
        1. Daytime shifts at a busy hospital is 1.1 points; slower hospitals are at a lower value
        2. Nighttime shifts are 1.7 points
        3. Weekend nights are 2.0
        4. The holidays shifts are worth a different number
        5. The points assigned to each shift every few months as workloads shift, politics are played, and as they have harder and harder times getting people to take particular assignments (due to location or workload)
     3. A doctor has to have a minimum number of shifts to get their full pay.
     4. Overtime bonus is applied if they have points above a particular number
     5. Include ability to give extra points to individuals that do admin work
  5. Input collection and export
     1. Each of the inputs needs to be consolidated into a single input file for the scheduling engine/tool

1. **Scheduling Engine / Tool / Algorithm**
   1. Optimization algorithm or tool
      1. May be Excel based (Solver, etc)
      2. If you can optimize the inputs and export them, I can do the scheduling in Excel and then feed into the software to create the outputs and reports
   2. Conflict identification
      1. If we program the tool internal (not excel), then it is necessary to identify conflicts or gaps in the schedule so the holes can be manually fixed
   3. Approval / Review and Publish
      1. If we automate the scheduling, the senior doctor will need to approve the schedule/point allocation for the month
2. **Outputs**
   1. Schedule for viewing
      1. By individual
      2. By Position
      3. By Hospital
   2. Point total
      1. By Individual
      2. Across the organization
   3. Email notification system
      1. It would be nice to prompt people to submit their inputs by deadlines
   4. Update personal calendars
      1. It would be nice to look at the individual schedule and have it populate on their Outlook or iPhone calendars
   5. Swap function
      1. If a doctor needs to change their schedule, they should be able to click on the shift on the calendar and “request a swap”
      2. System then offers the ability to email specific individuals or the entire group
      3. When someone agrees to a swap, the system automatically updates the schedule/points
      4. May require 3 or more people to make the schedule work (low priority)