

Red Hat Business Optimizer 7

OptaWeb Employee Rostering Demo - Walkthrough

Introduction

This demo shows a system to find the optimal solution to an [Employee Rostering \(ER\) Problem](#). The application is implemented on Red Hat Decision Manager 7/Business Optimizer 7 and the demo shows the following concepts:

- An OptaPlanner Constraint Solver running on Spring Boot, providing a RESTful API.
- A ReactJS client application that allows the user to either load a predefined ER problem or create a new ER problem by creating a new Tenant and adding Skills, Spots, Contracts, Employees, Shifts and Availabilities.

After your environment has been provisioned to RHPDS, you can login to the OpenShift environment using the details provided by RHPDS.

Once you've logged into the OpenShift environment, open the **optaweb-employee-rostering-GUID** project (GUID is a random string unique for each ordered demo). Then open the **Networking** section on the left hand side menu and click **Routes**.

Red Hat OpenShift Container Platform

Project: optaweb-employee-rostering-4456

Routes

Create Route

Filter Routes by name...

1 Accepted 0 Rejected 0 Pending Select All Filters 1 Item

NAME	NAMESPACE	LOCATION	SERVICE	STATUS
employee-rostering	optaweb-employee-rostering-4456	http://employee-rostering-optaweb-employee-rostering-4456.apps.shared-rhpd.s.rhpd.openshift.opentlc.com/	employee-rostering	Accepted

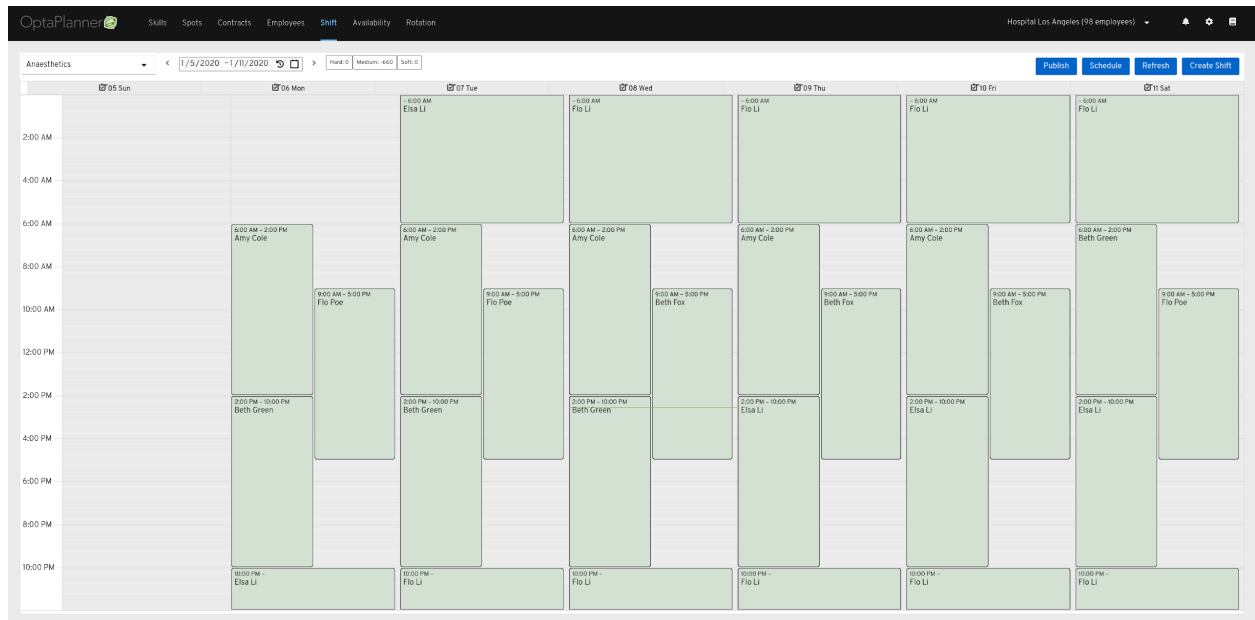
Routes

URL of OptaWeb Employee Rostering

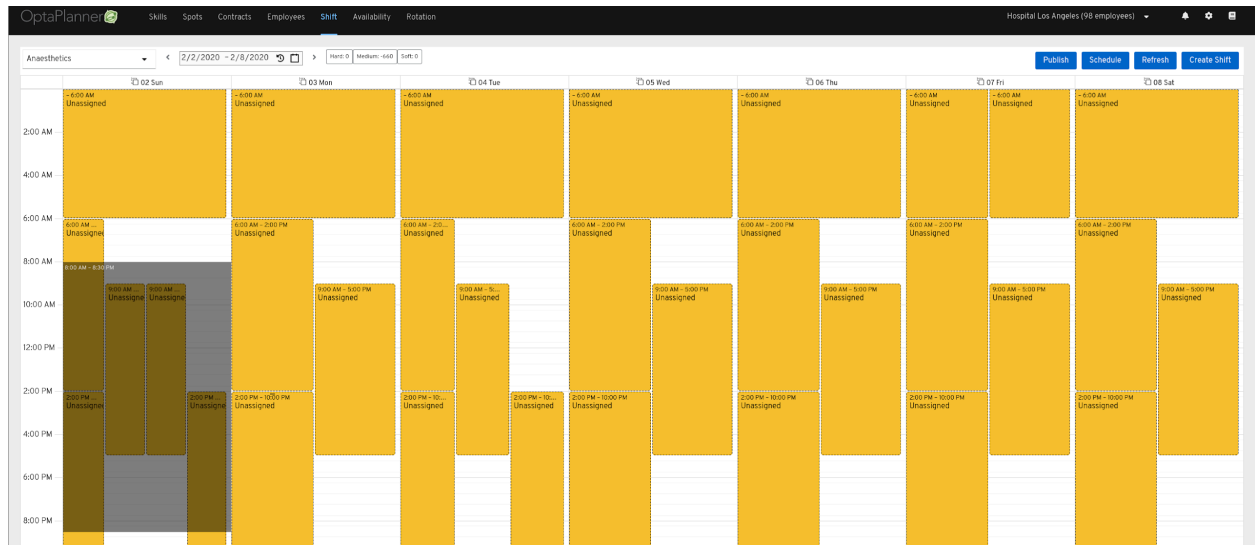
- 1) Click the link in the **Location** column of the route to open the OptaWeb ER user interface.

The Basics

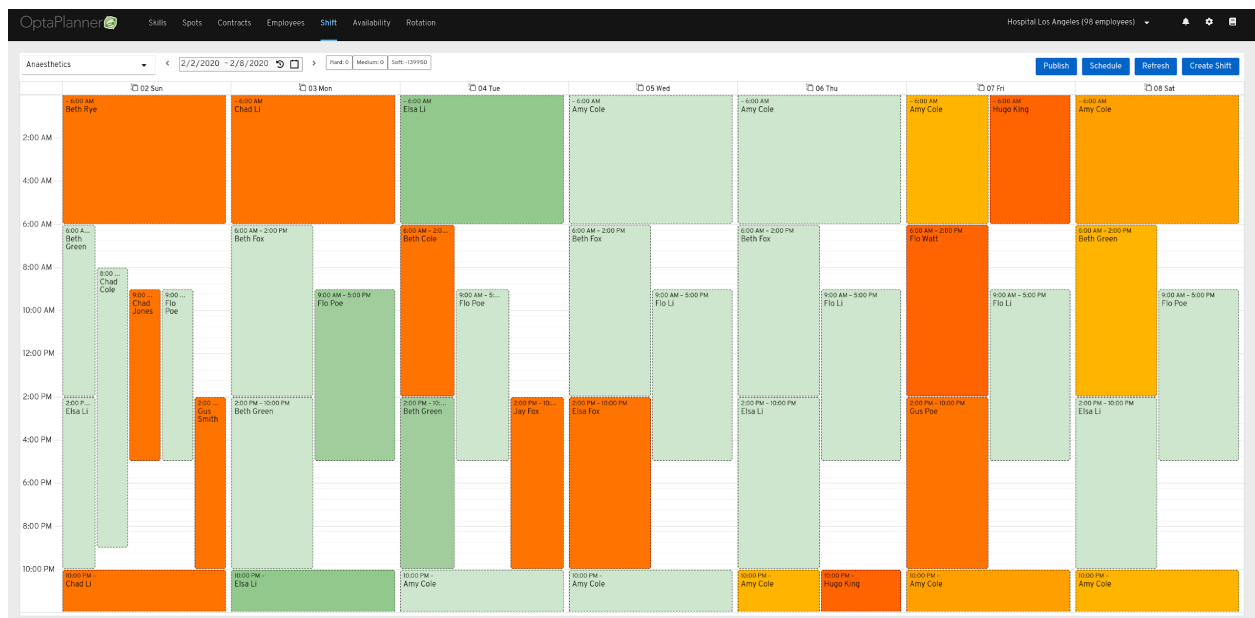
- 2) In the demo UI, click on the “Shifts” tab.



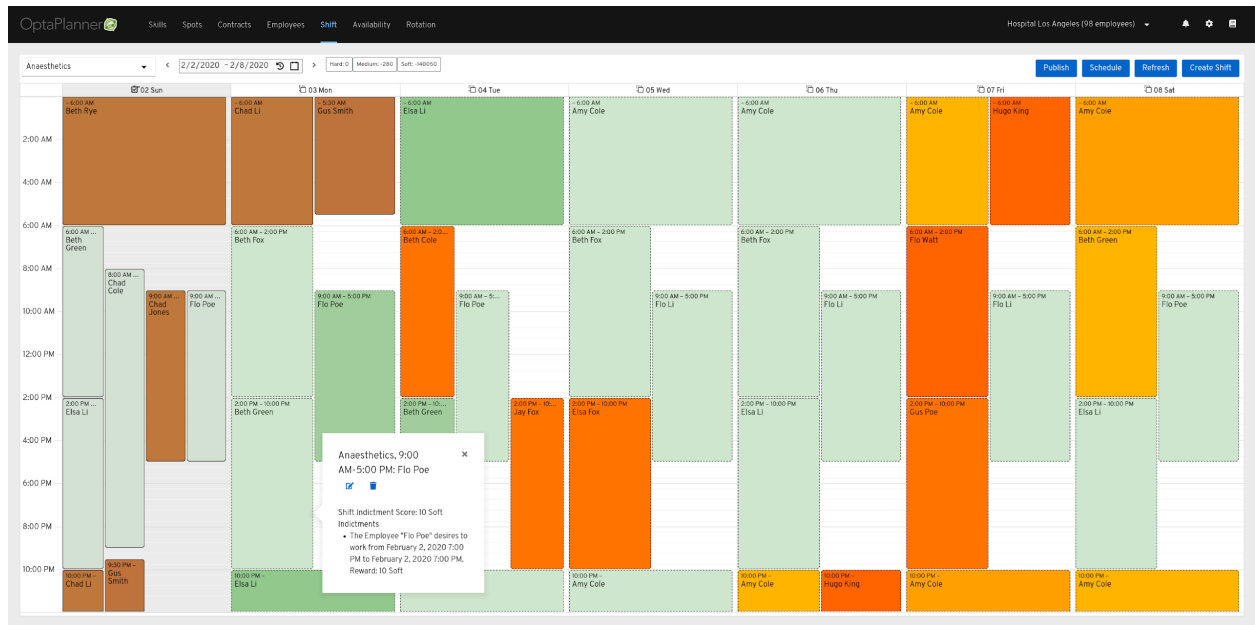
- 3) You'll see the set of Shifts for the current week in the Anaesthetics department for tenant “Hospital Los Angeles”. Click the right arrow (next to the week selector) 4 times. This will take you into the draft section of the schedule. Shifts in the draft section of the schedule are subject to change until they are published. You can add shifts by dragging the mouse between the shift's start and end times in the corresponding day column.



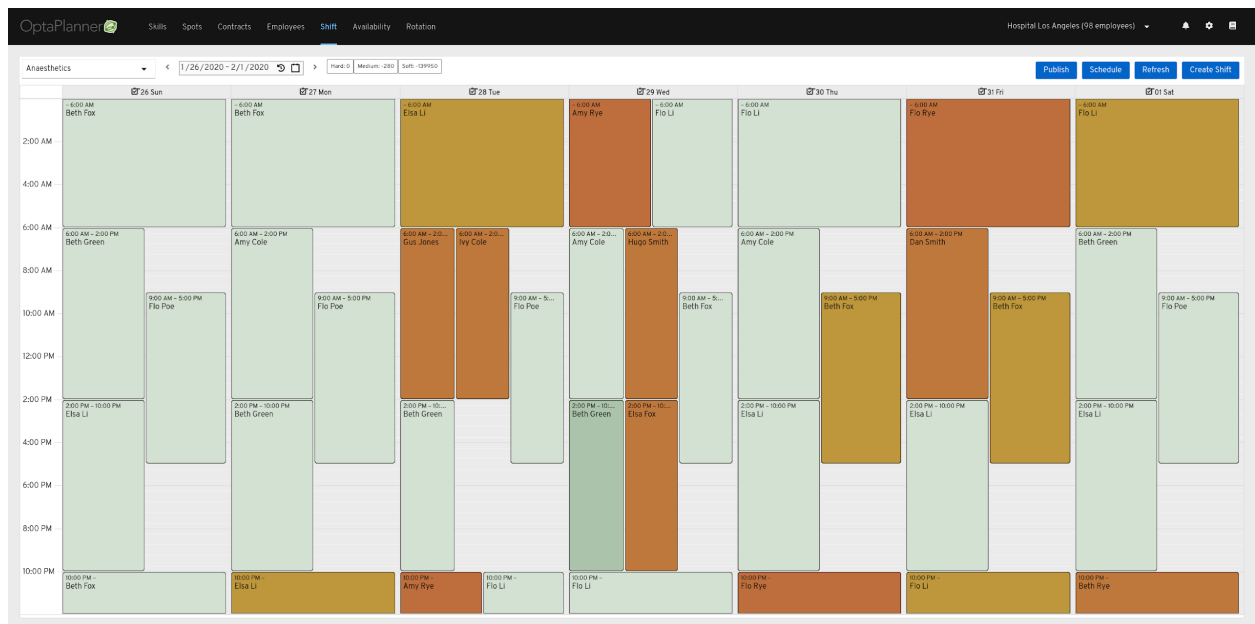
- 4) Begin solving by pressing the “Schedule” button. When scheduling, you cannot add Shifts or Availabilities. You will see the employee of each shift change as OptaPlanner searches for the optimal solution. The shifts are colored according to how many constraints and preferences it matches. Shifts that are green match more preferences and have a higher score than shifts that are red and break constraints/preferences.



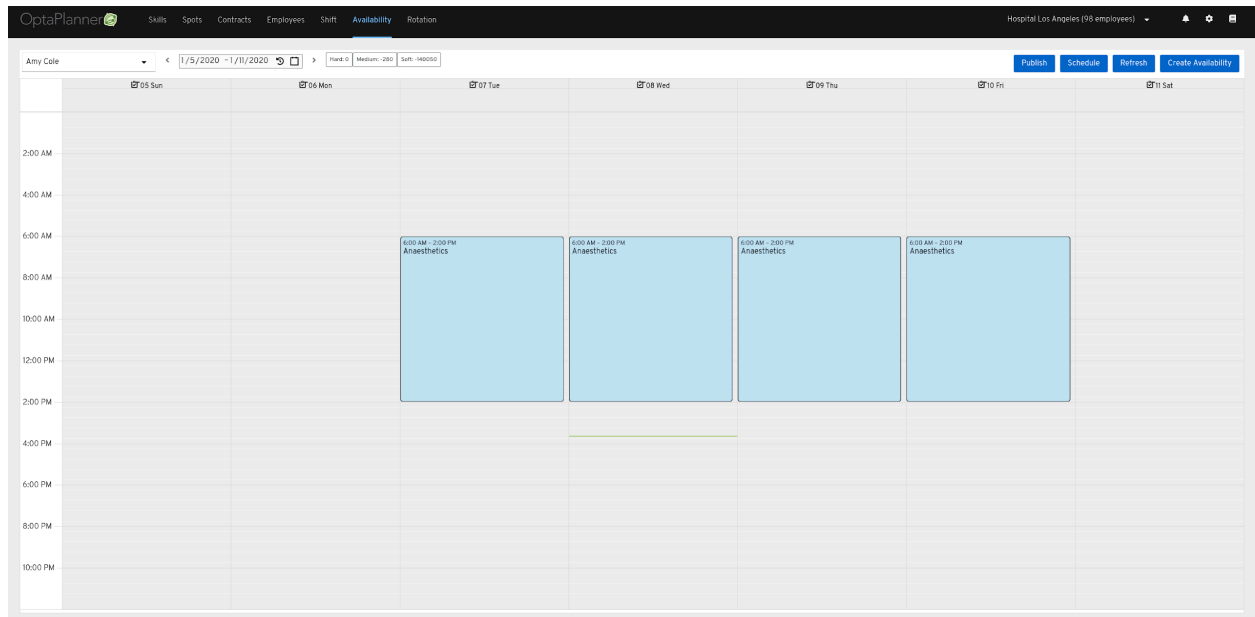
- 5) Clicking a Shift shows a popover that displays what preferences the shift matches and what constraints/preferences the shifts breaks. Clicking the edit button in the Popover allows you to edit the Shift. Clicking the trash button deletes the Shift.



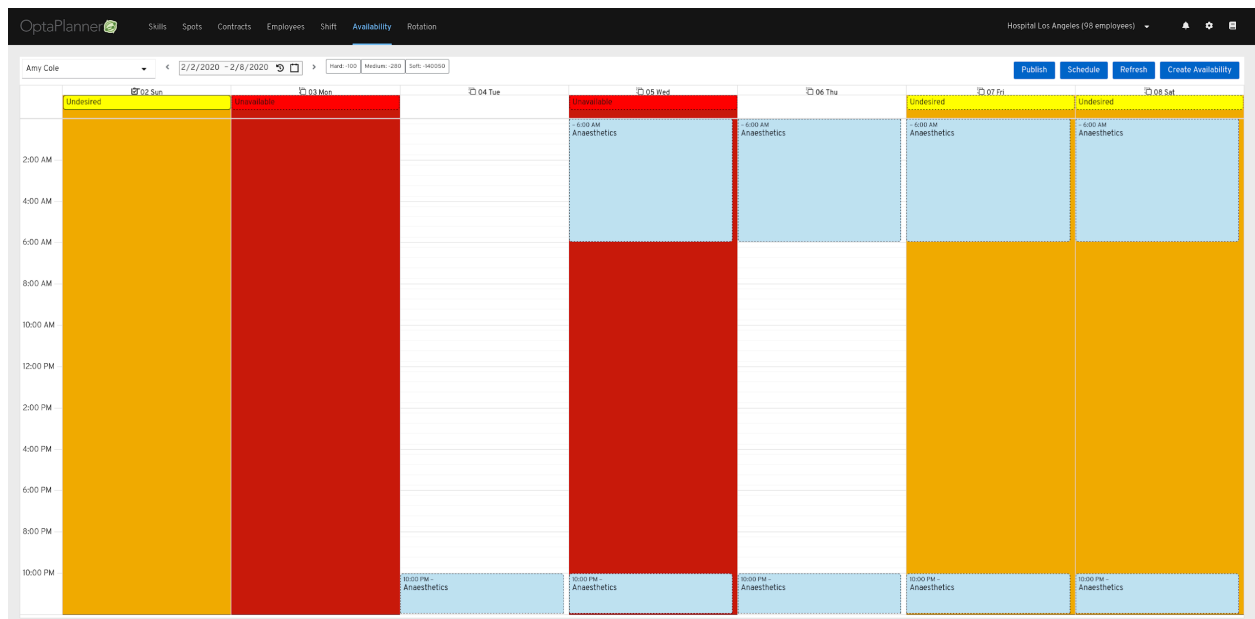
- Click the left arrow (next to the week selector) and click the “Publish” button. You should see the day columns fade and have their icons change. This indicates these shifts have been published; publishing moves the draft start date up by one week and generates new shifts from the rotation to the end of the draft.



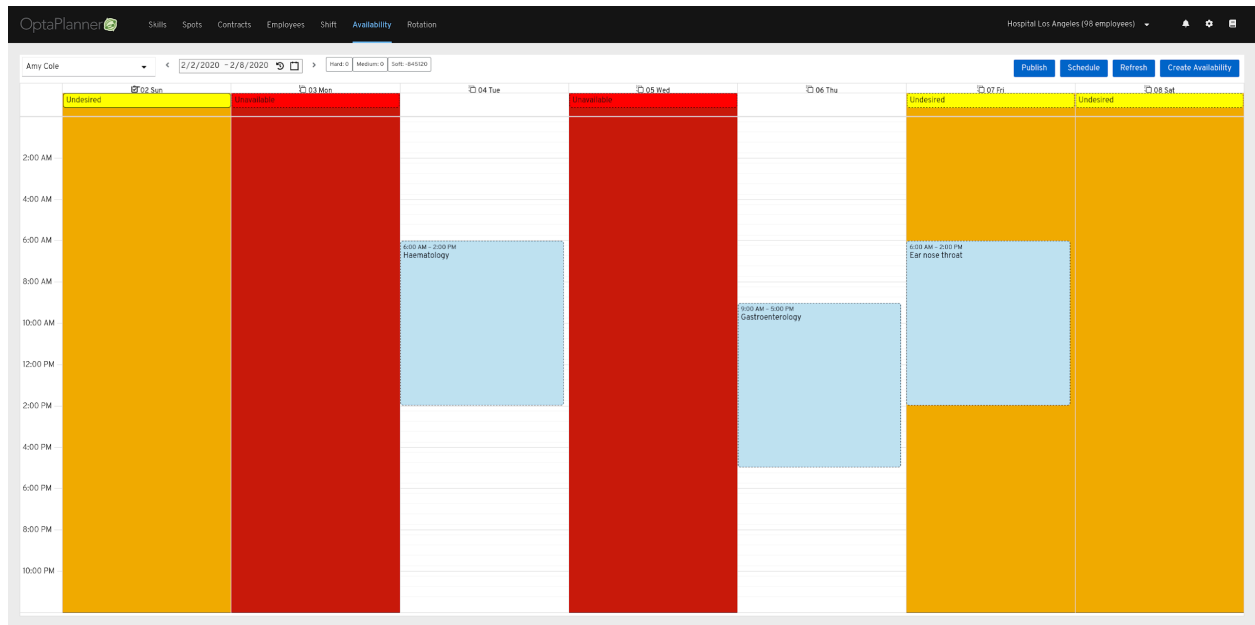
- Click the “Availability” tab. This takes you to the Availability screen, which displays what Shifts an Employee has for a given week, as well as any days the employee requested off (yellow background), taken PTO (red background) on, or desires to work (green background).



- 8) Click the right arrow (next to the week selector) four times. On the fourth day of the week, click on the white space right below the date. This will create a new day Amy Cole is taking PTO on. Note Amy Cole has a shift scheduled to her on that date.

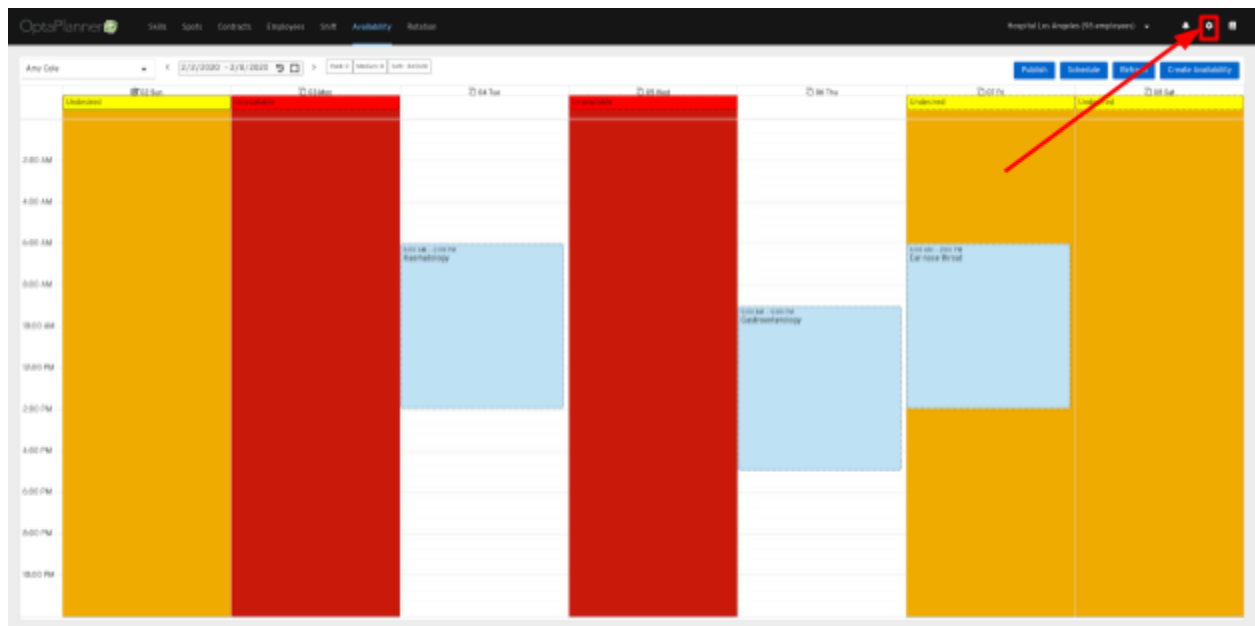


- 9) Click the “Schedule” button. Notice that OptaPlanner unassigns the Shift on the fourth day of the week and starts moving Shifts around to avoid breaking any hard constraints.

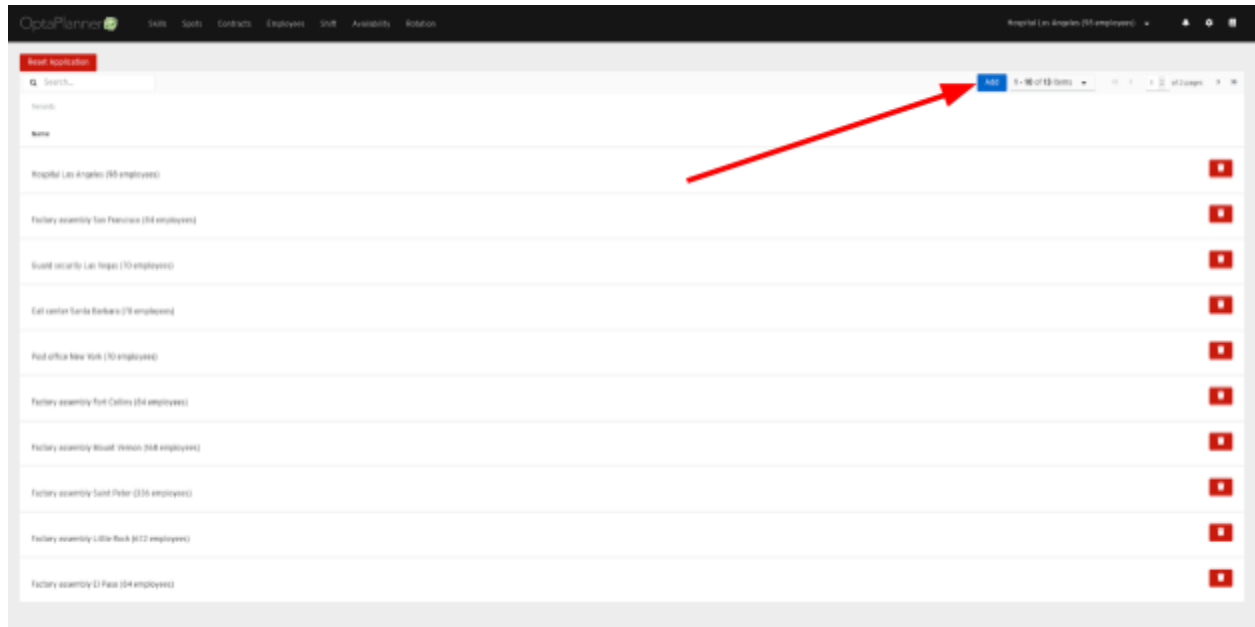


Creating your own Tenant

10) Click on the gear icon in the top right. This will take you to the Admin Page.



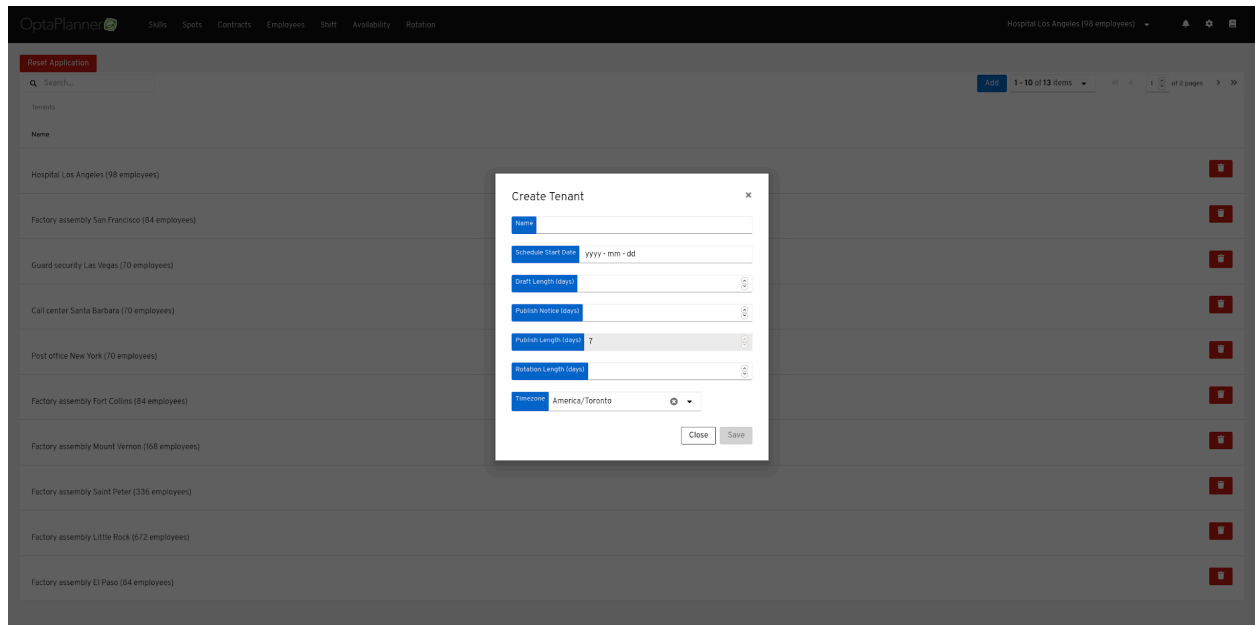
11) Click on the add button.



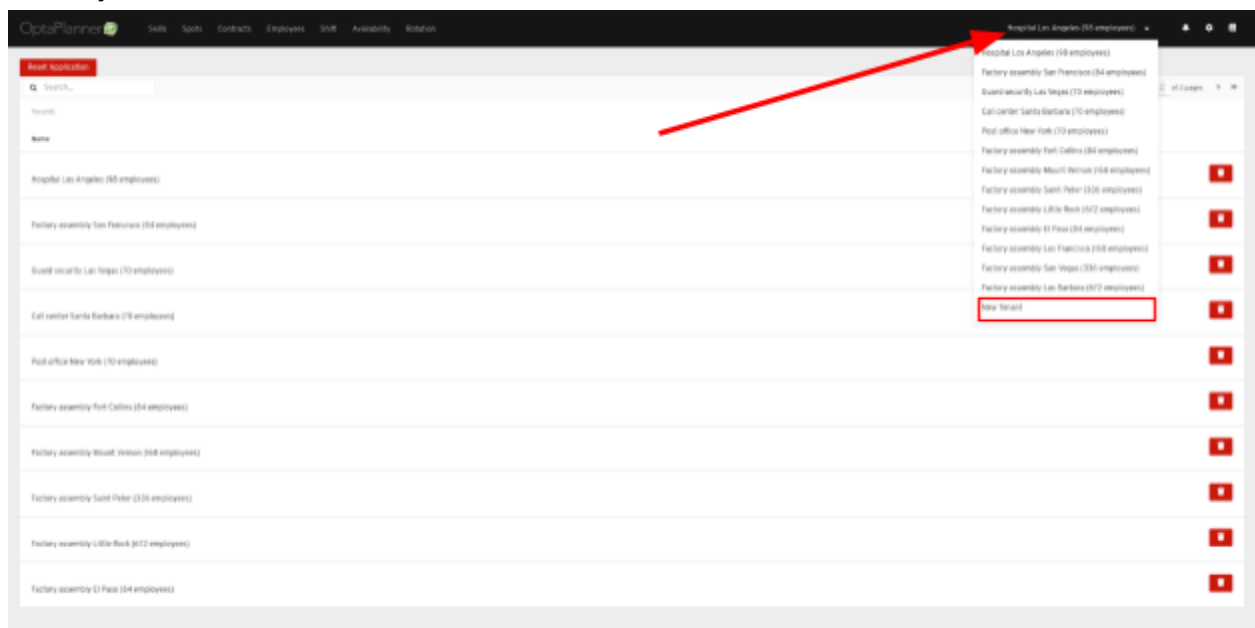
12) This will show the “Create Tenant” form. This form has several options:

- a) Name: The name of the tenant. Enter “New Tenant” into this field.
- b) Schedule Start Date: The first day of the schedule. This will determine where the draft period starts. **Note that this will determine what day your rotation starts on** (so if you pick a Monday, your Rotation begins on a Monday). Put the current date into this field.
- c) Draft Length (days): How many days can be in the draft period at a time. It should be greater or equal to the “Publish Length”. Enter “7” into this field.
- d) Publish Notice (days): How many days in advance do Employee need to know their Shifts in advance. Enter “7” into this field.
- e) Publish Length (days): How many days are published at a time. When shifts are published, this many days of shifts move from the “Draft” to the “Published” period, and this many days of shifts are added to the “Draft” period from the Rotation. This option is permanently set to 7.
- f) Rotation Length (days): How many days before the Rotation repeats. Enter 7 into this field.
- g) Timezone: The timezone to use in the Database. You can leave this field at its current value.

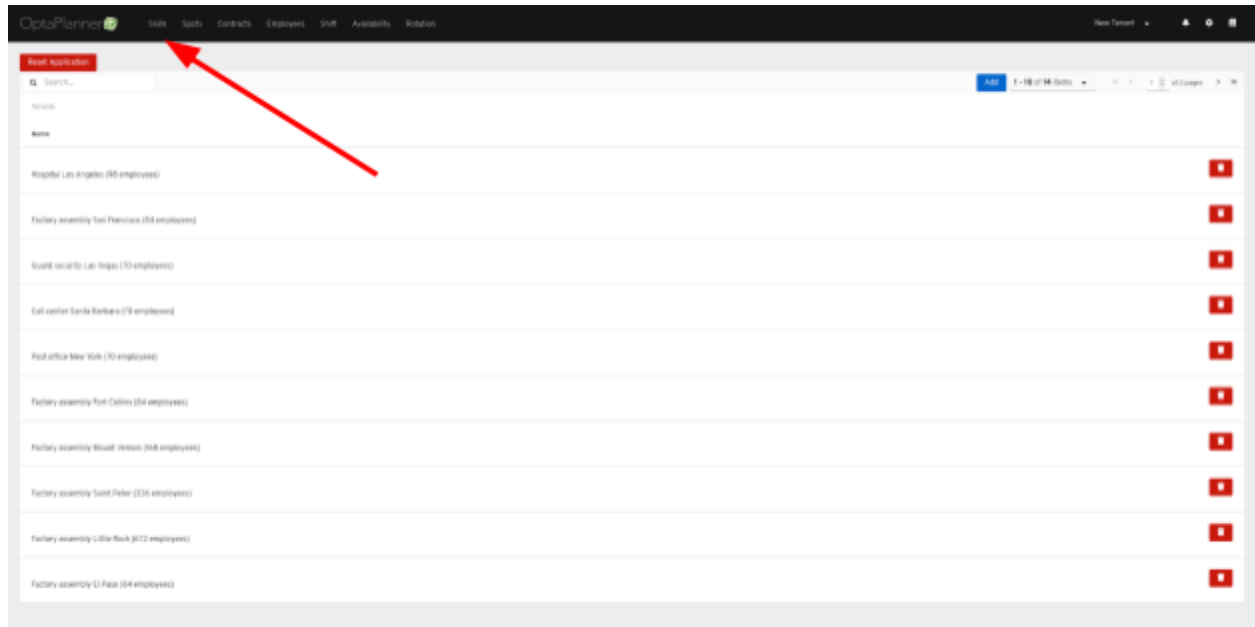
Once you filled in all the fields, click “Save”.



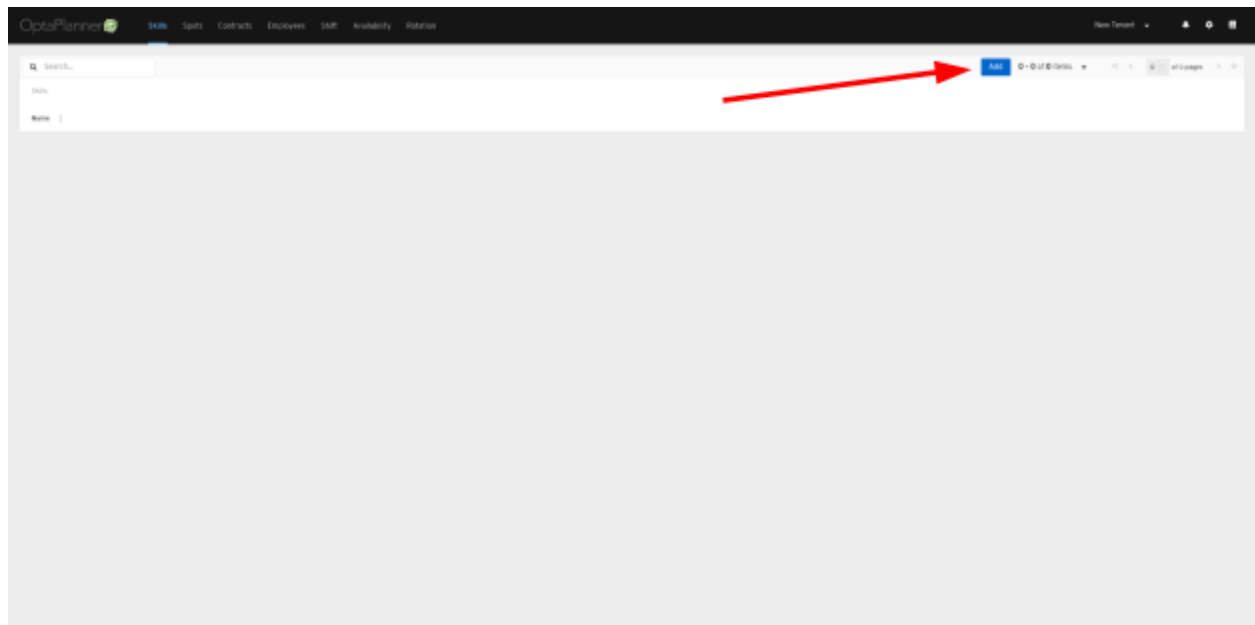
13) Click the “Tenant Select” located in the upper right of the screen. Then click on “New Tenant”. This will change the active Tenant from your previous Tenant to the Tenant you just created.



14) Click on the “Skills” tab.

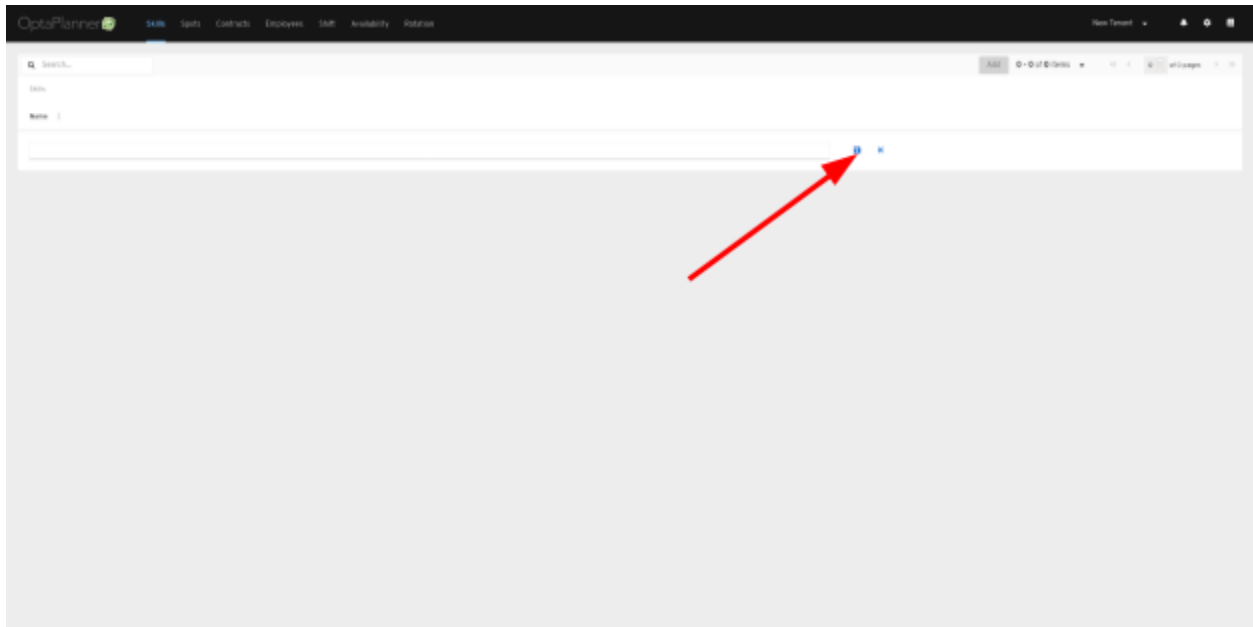


15) This will take you to the “Skills” page. This display the set of possible Skills Employees may have and Spots may require. Currently, there are no Skills. Press the “Add” button.

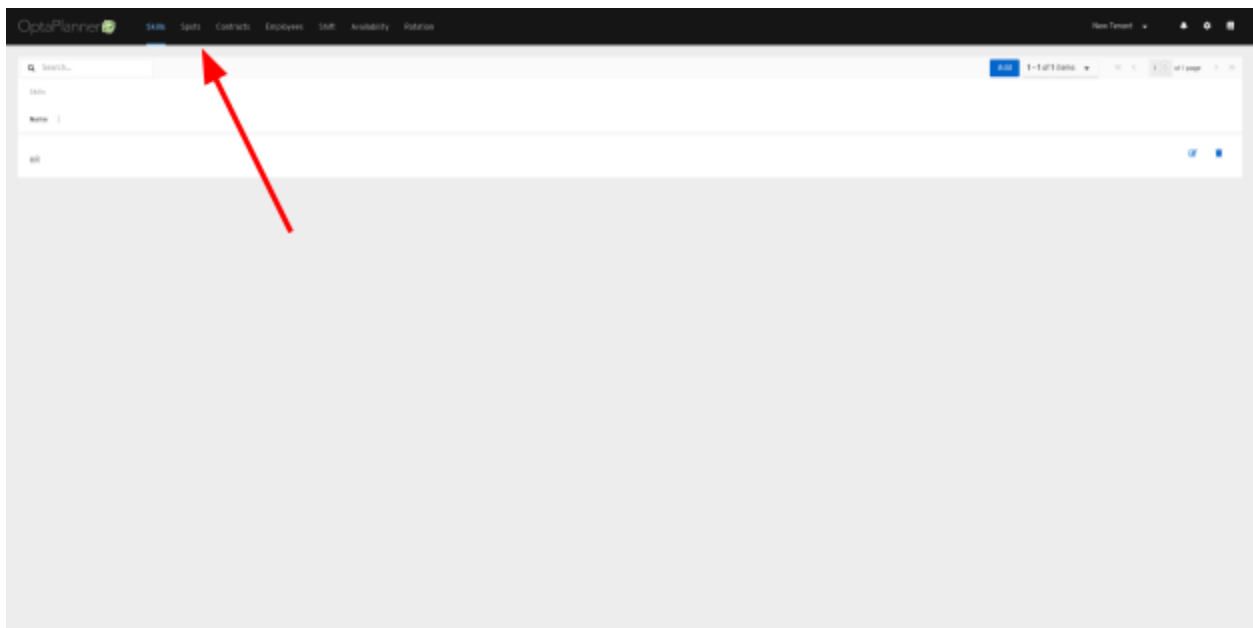


16) This will add a new row to the top of the Skills table. The Skills table have the following fields:

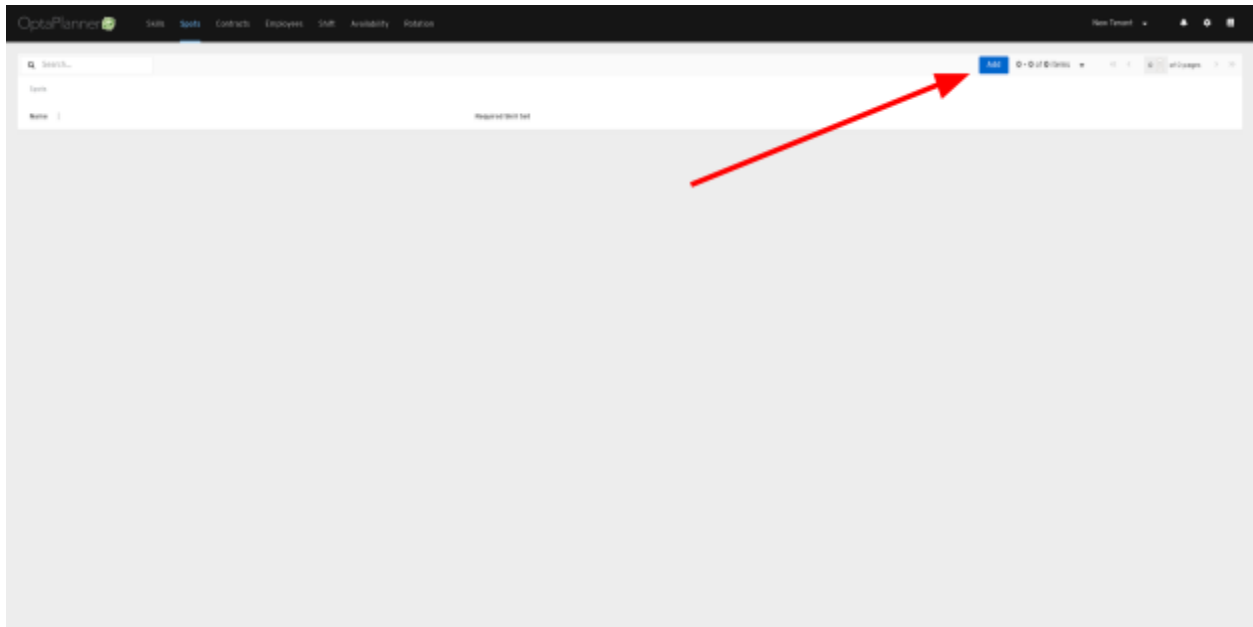
- a) Name: The name of the skill. Enter “HR” into this field.
- Once you filled in all the fields, click the “Save” icon to save this Skill.



17) Click on the “Spots” tab.



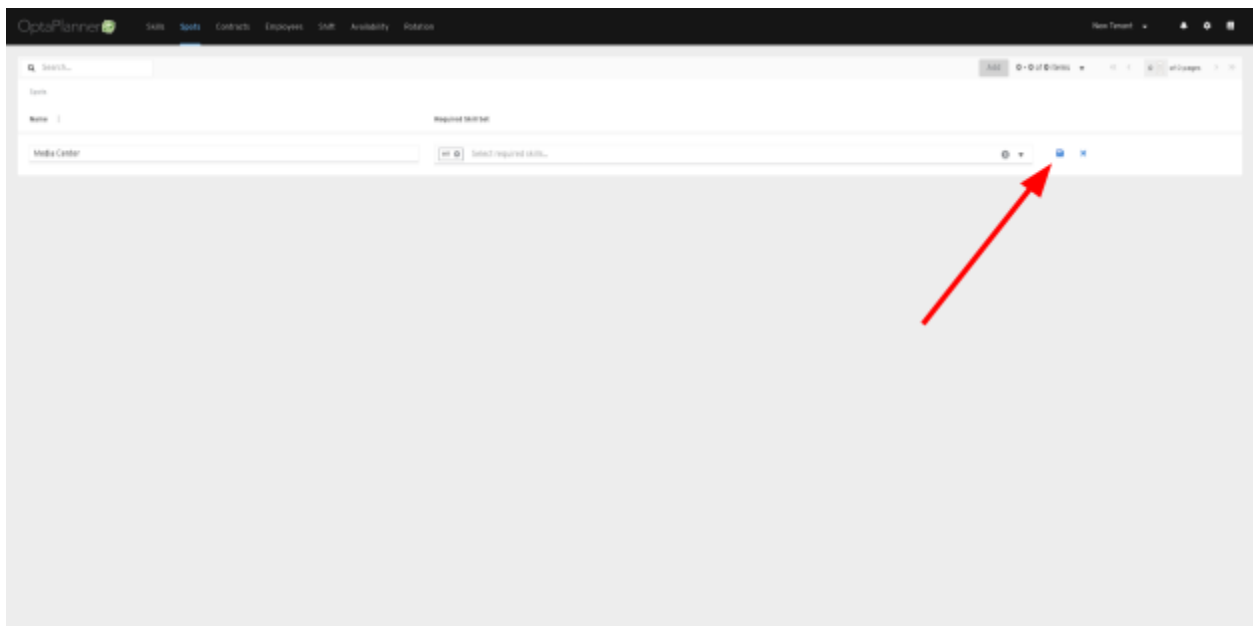
18) This will take you to the “Spots” page. This screen displays what Spots a Shift can be in. Currently, there are no Spots. Click the “Add” button.



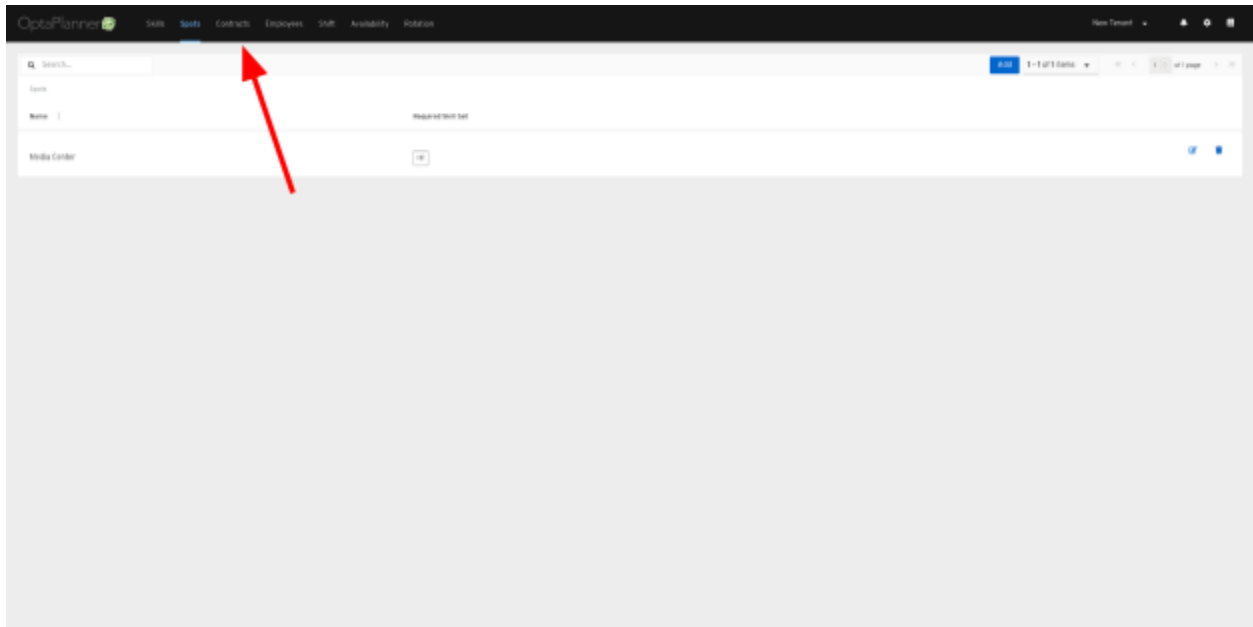
19) This will add a new row to the top of the Spots table. The Spots table have the following fields:

- a) Name: The name of the spot. Enter “Media Center” into this field.
- b) Required Skill Set: The skills required for this Spot. Type in “HR” then enter to add the “HR” skill as a requirement for this Spot.

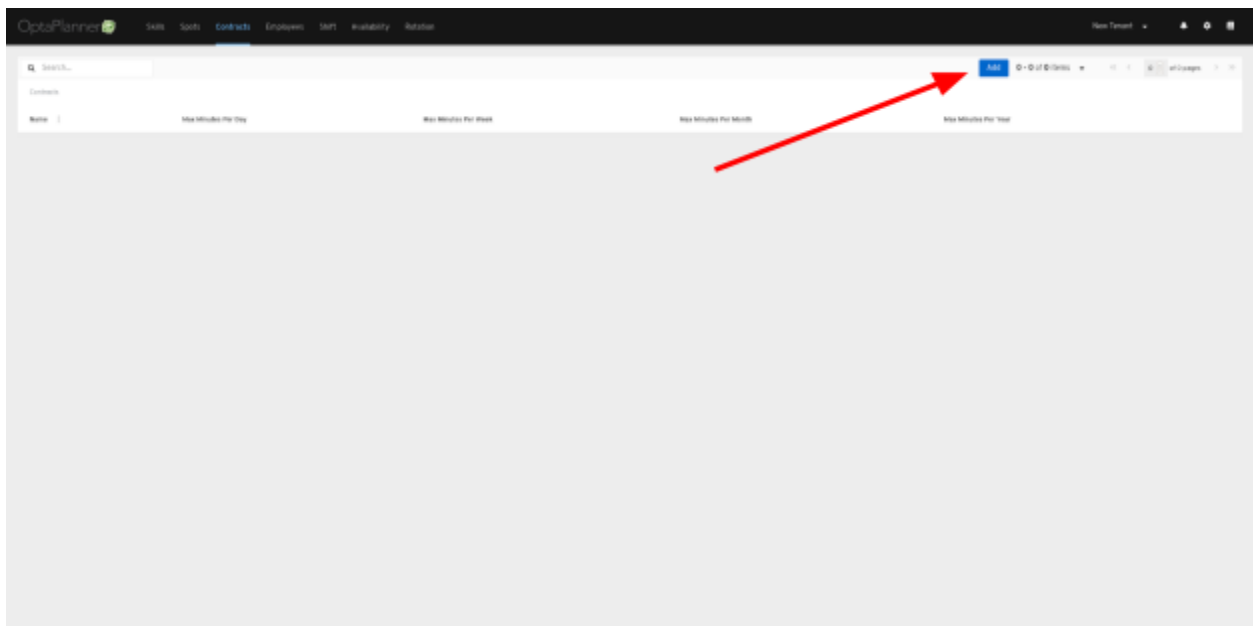
Once you fill in all the fields, click the “Save” icon to save this Spot.



20) Click on the “Contracts” tab.



21) This will take you to the “Contracts” page. This screen displays what Contracts an Employee may have, which restricts what Shifts the Employee may be assigned to. Currently, there are no Contracts. Click the Add button.

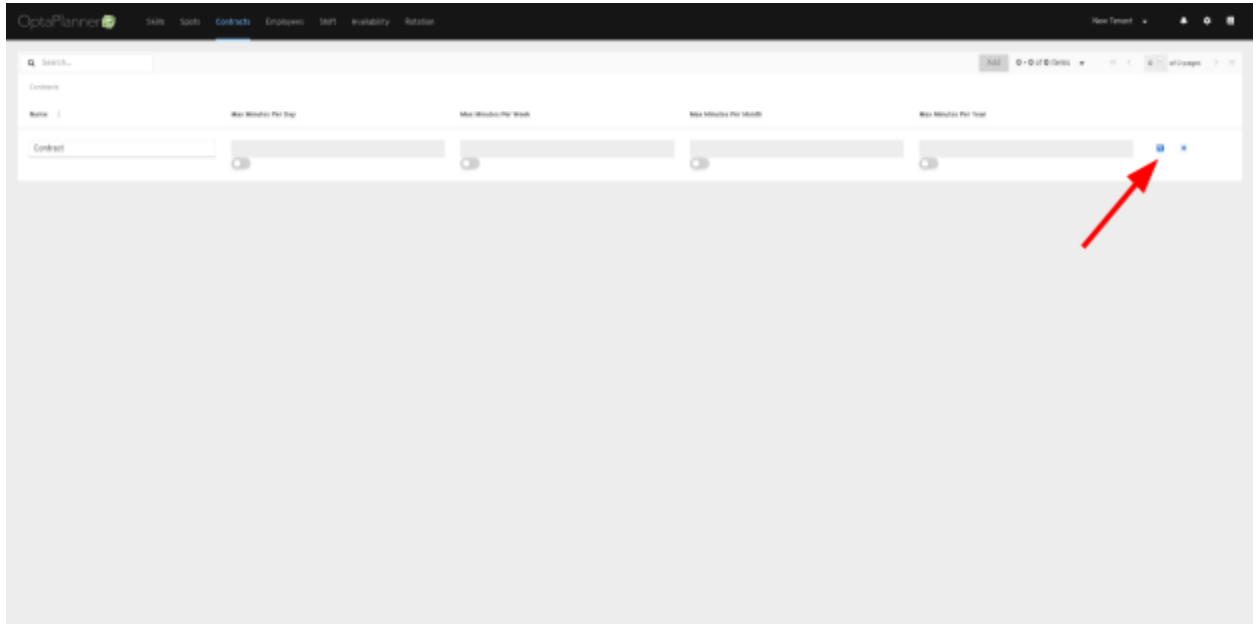


22) This will add a new row to the top of the Contracts table. The Contracts table have the following fields:

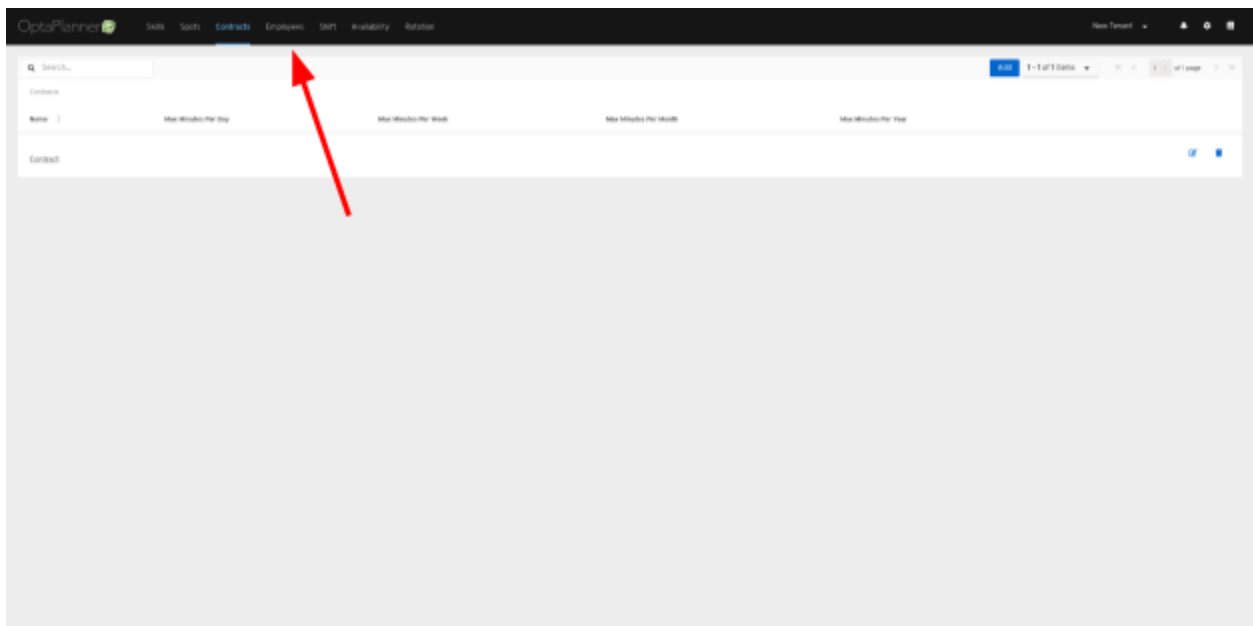
- Name: The name of the contract. Enter “Contract” into this field.
- Max Minutes Per Day: Maximum amount of minutes an Employee could work in a day. Leave this field blank.
- Max Minutes Per Week: Maximum amount of minutes an Employee could work in a week. Leave this field blank.

- d) Max Minutes Per Month: Maximum amount of minutes an Employee could work in a month. Leave this field blank.
- e) Max Minutes Per Year: Maximum amount of minutes an Employee could work in a year. Leave this field blank.

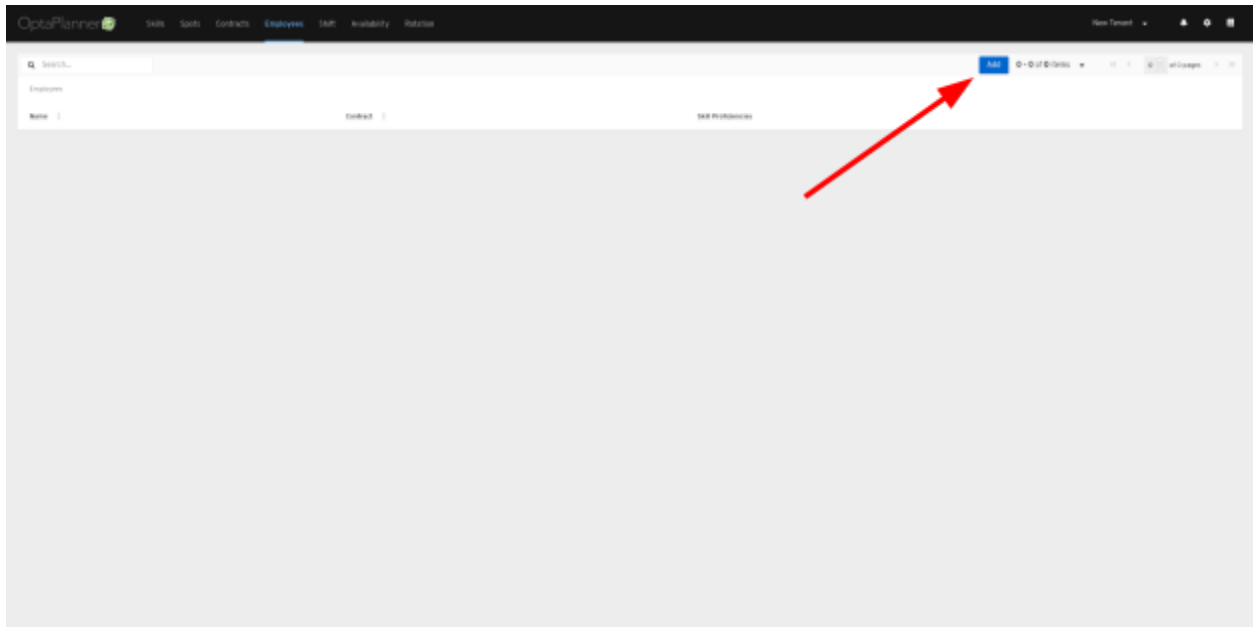
Once you fill in all the fields, click the “Save” icon to save this Contract.



23) Click on the “Employees” tab.



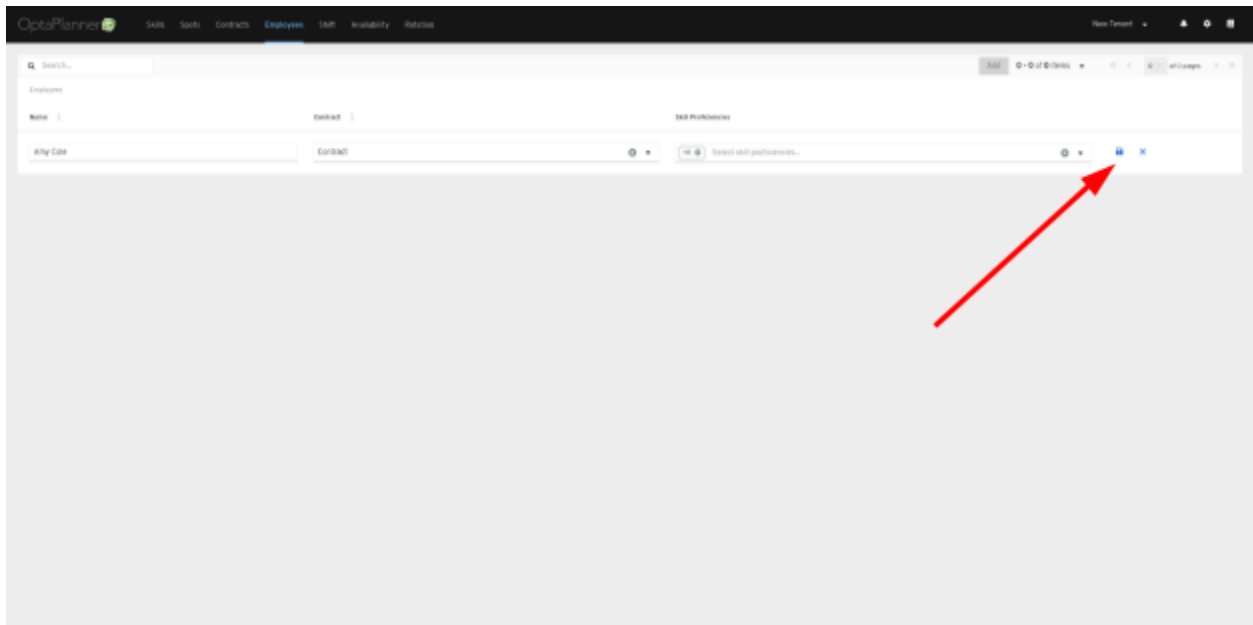
24) This will take you to the “Employees” page. This screen displays what Employees can be assigned to Shifts. Currently, there are no Employees. Click the “Add” button.



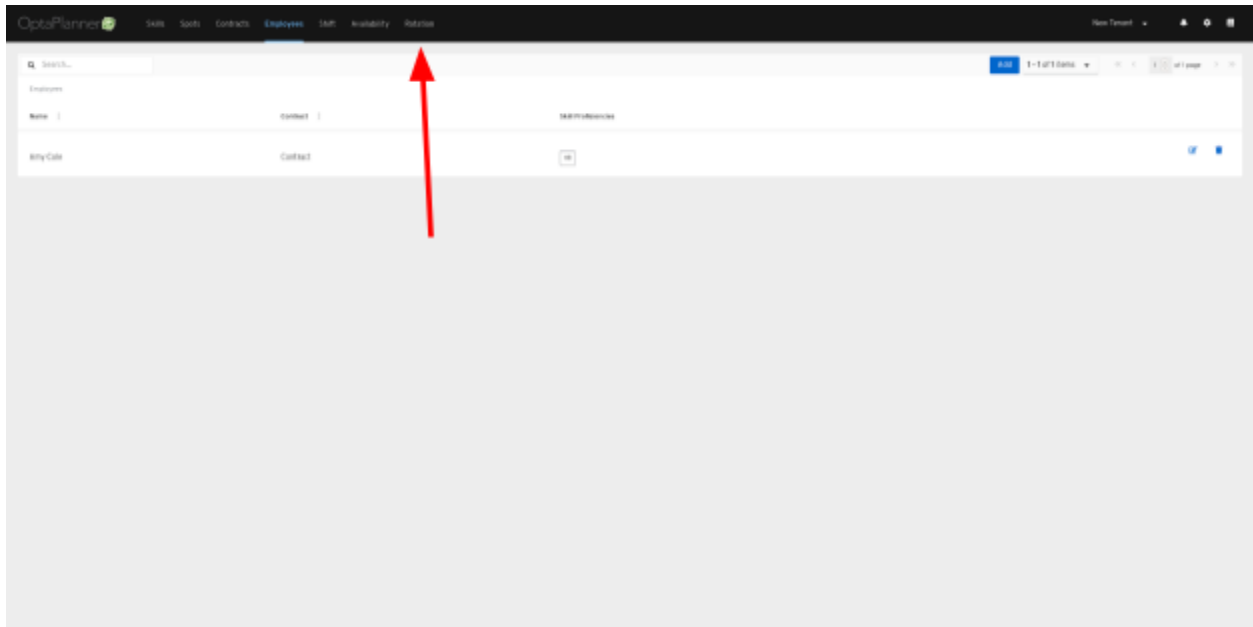
25) This will add a new row to the top of the Employees table. The Employees table have the following fields:

- Name: The name of the Employee. Enter "Amy Cole" into this field.
- Contract: The Contract the Employee has. Type "Contract" then enter to give this Employee the "Contract" contract.
- Skill Proficiencies: The skills the Employee is certified in. Type in "HR" then enter to add the "HR" skill as a skill proficiency for this Employee.

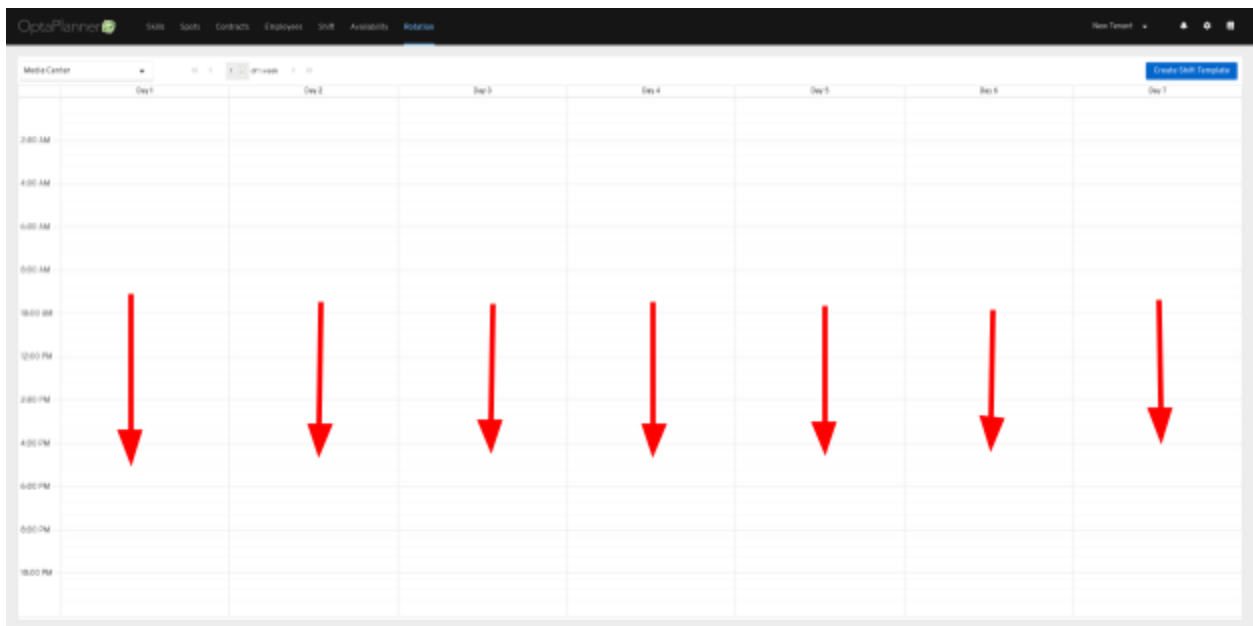
Once you fill in all the fields, click the "Save" icon to save this Employee.



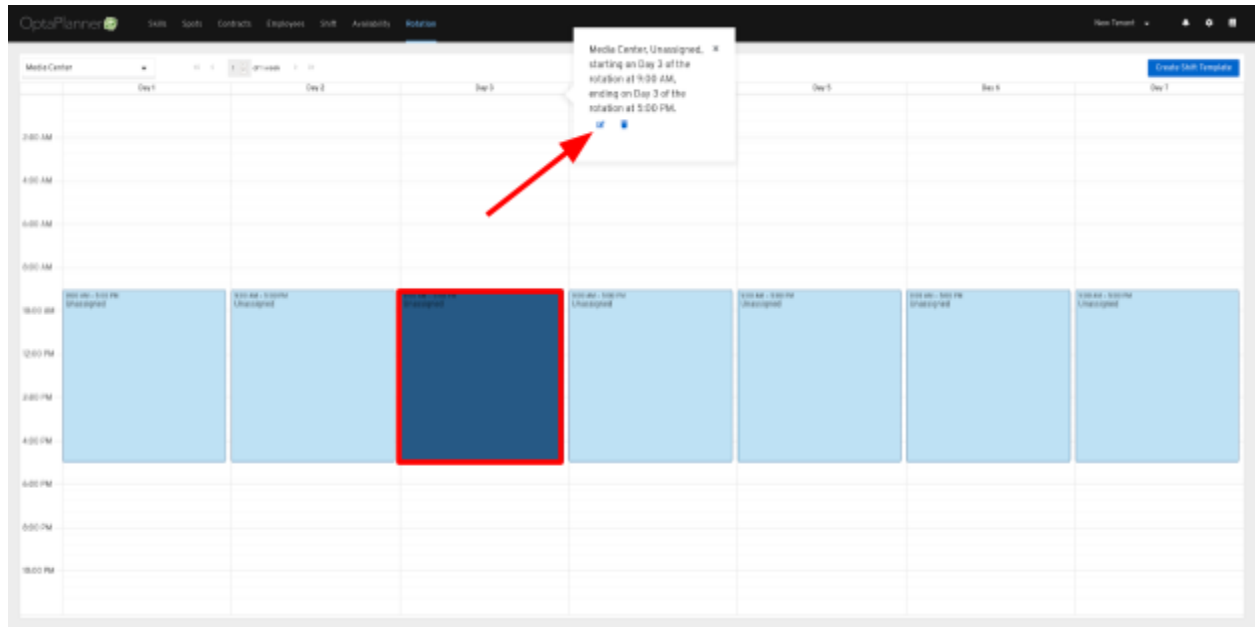
26) Click on the "Rotation" tab.



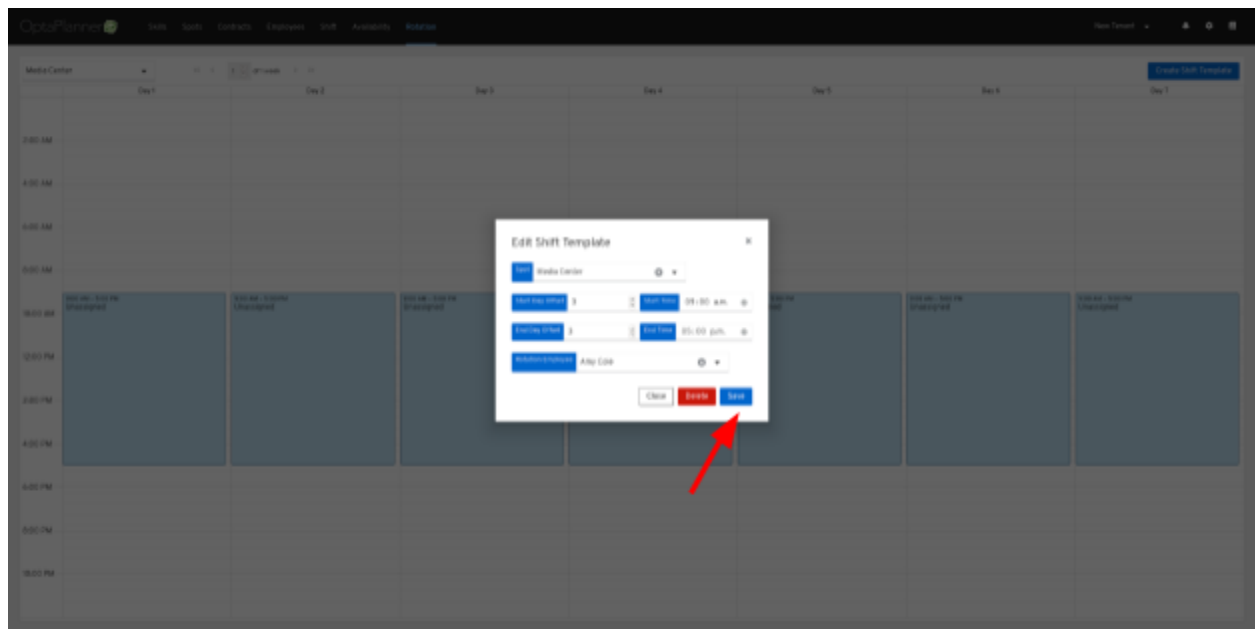
27) The Rotation is a set of Shifts automatically provisioned whenever the schedule is published. It can be used to give Employees a sense of stability (for instance, a typical Rotation for an Employee may be a week of days, followed by a week of afternoons, followed by a week of nights, followed by a day off). Create a shift template each day from 9am - 5pm for the Media Center Spot by dragging the mouse from 9am to 5pm in each column.



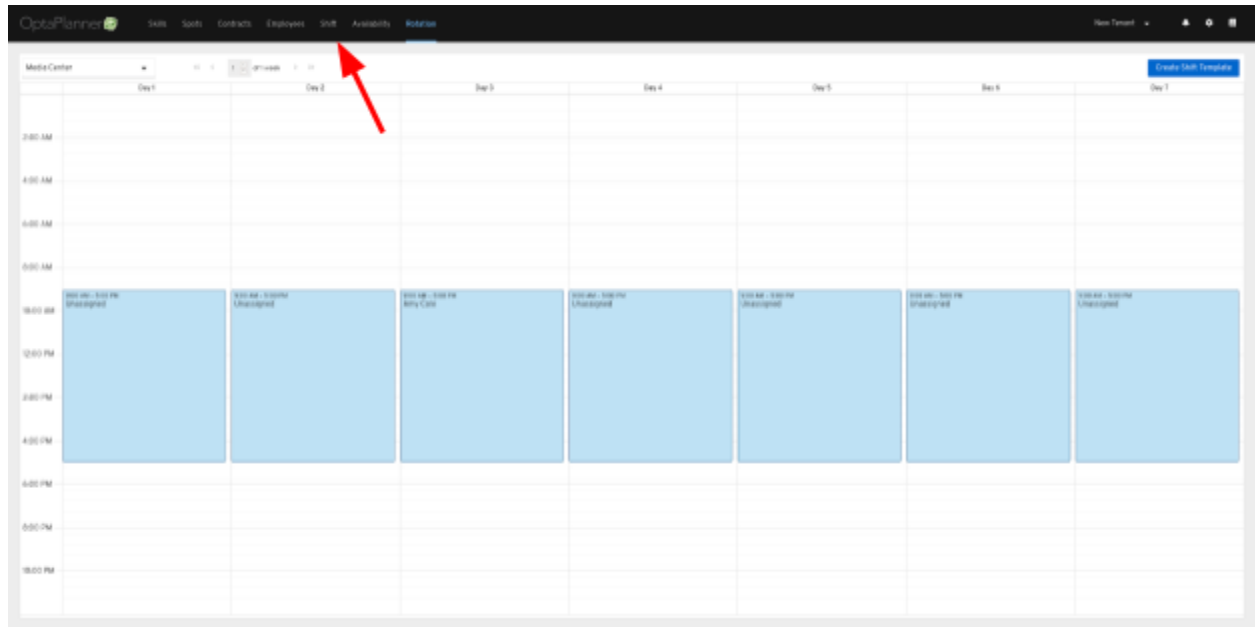
28) Click on the Shift on Day 3 of the Rotation and click the “Edit” button.



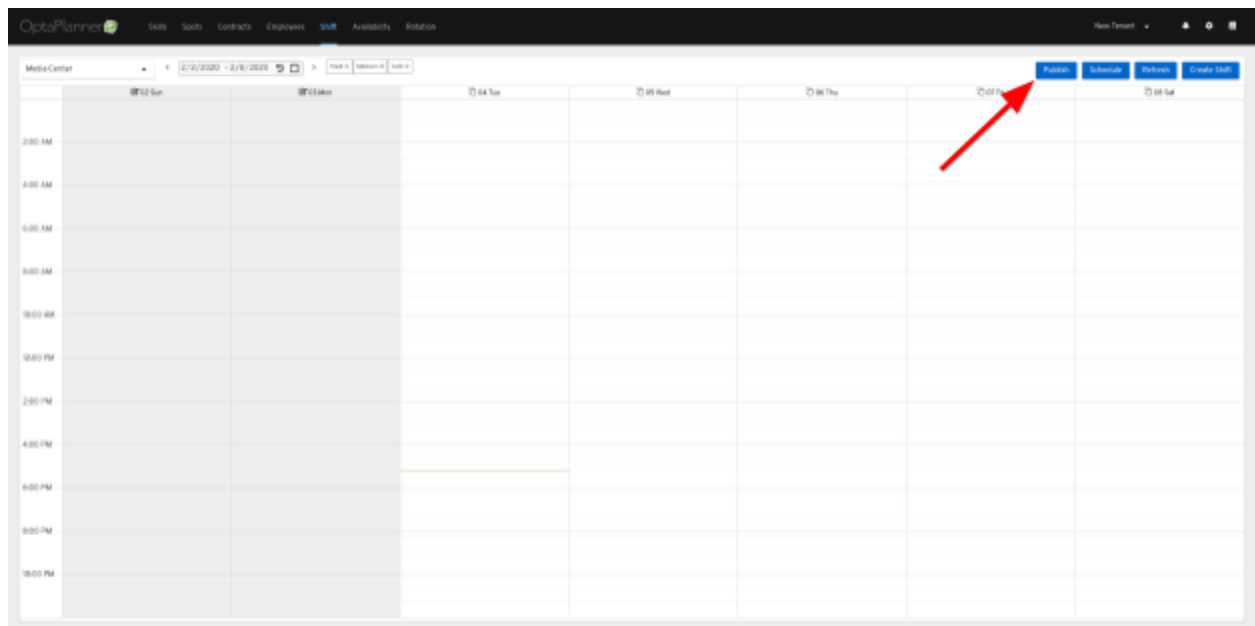
29) This displays the “Edit Shift Template” form. Here, you can set the Rotation Employee of this Shift Template. The Rotation Employee is the preferred Employee for this Shift Template. Click Rotation Employee, type “Amy Cole”, and enter then click “Save” to make Amy Cole the Rotation Employee for this Shift Template.



30) Click on the “Shifts” tab.



31) Click the “Publish” button.



32) Navigate to the next week by clicking the right arrow of the week selector. Note the 7 Shifts Templates you created in the Rotation were added as new Shifts after the end of the previous draft period.

OptaPlanner

Skills

Spots

Contracts

Employees

Shift

Availability

Rotation

New Tenant

Media Center

<

2/9/2020 - 2/15/2020

>

Head: 0

Medium: 7

Shift: 0

Publish

Schedule

Refresh

Create Shift

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
2:00 AM							
4:00 AM							
6:00 AM							
8:00 AM							
10:00 AM			9:00 AM - 5:00 PM Unassigned	9:00 AM - 5:00 PM Unassigned	9:00 AM - 5:00 PM Unassigned	9:00 AM - 5:00 PM Unassigned	9:00 AM - 5:00 PM Unassigned
12:00 PM							
2:00 PM							
4:00 PM							
6:00 PM							
8:00 PM							
10:00 PM							