
Evolutionary Shifts

Shaked Asher

Andrio Hanania

Amit Asher



About

Many businesses such as restaurants, hotels, security companies and hospitals have employees that work in shifts.

Our project is about scheduling those work shifts automatically for businesses in one generic platform using Evolution algorithms!



1. The manager loads the company details: employees and their qualifications

The screenshot shows a web application interface for 'Evolutionary Shifts'. The left sidebar contains navigation menus for 'Evolutionary Shifts', 'Manager-portal', 'Employees-portal', and 'Business'. The main content area is titled 'Employees Dashboard' and features a 'Settings' section with input fields for 'First Name', 'Last Name', 'Email', and 'Phone number'. Below this is a table of employees with columns for 'First Name', 'Last Name', 'Email', 'Phone number', and 'Roles'. A dropdown menu for 'Select Roles' is open, showing options: 'chef', 'barman', 'manager', 'waiter', and 'host'. The table lists three employees: Andrio Hanania, Amit Asher, and Shaked Asher. The bottom right corner shows 'Rows per page: 5' and '1-3 of 3'.

Evolutionary Shifts

Project Overview

Manager-portal

- Arrangement
- Employees
- Requests
- History
- Settings

Employees-portal

- Preferences
- Arrangement

Business

- Premuim
- Contact us

Sign out

Settings

Employees Dashboard

Roles

Employees

First Name Last Name Email Enter phone number

Select Roles

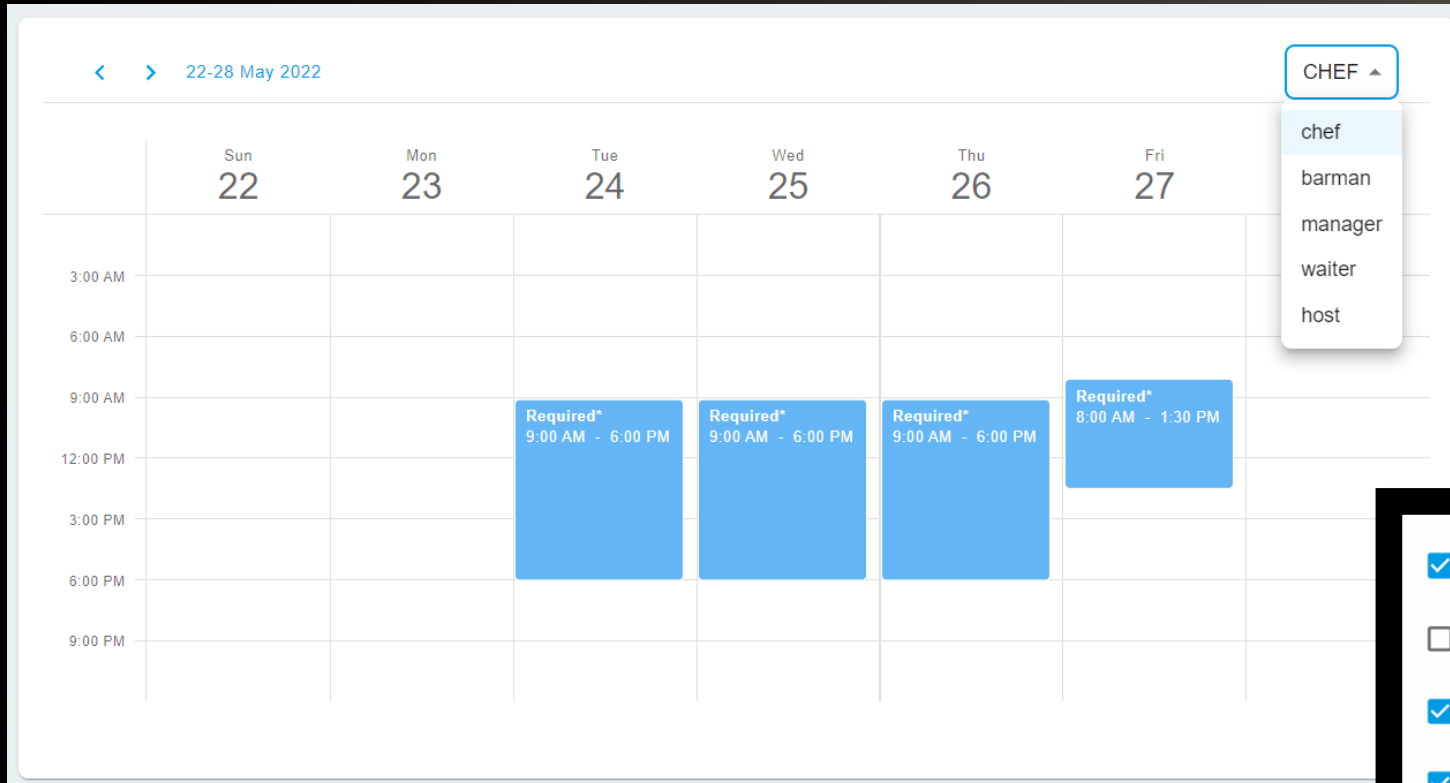
Select

Add Employee

<input type="checkbox"/>	First Name	Last Name	Email	Phone number	Roles
<input type="checkbox"/>	Andrio	Hanania	andrio@gmail.com	+972502110585	manager host waiter
<input type="checkbox"/>	Amit	Asher	asheramit@gmail.com	+972546885755	barman
<input type="checkbox"/>	Shaked	Asher	doctor-shoker@gmail.com	+972503014445	chef

Rows per page: 5 1-3 of 3

2. The manager defines the properties for the upcoming arrangement: Slots, participants and additional features.



Settings panel for the arrangement:

- Slots (default) ⓘ
- Enemies Rule ⓘ
- Qualifications ⓘ
- Vacations Rule ⓘ
- Partners Rule ⓘ

Tooltip for Partners Rule: this rule consider two employees that want to work together.

3. Each employee will send its preferences

Shaked Asher ▾

< > 22-28 May 2022 CHEF ▾

	Sun 22	Mon 23	Tue 24	Wed 25	Thu 26	Fri 27	Sat 28
3:00 AM							
6:00 AM							
9:00 AM			*Option 9:00 AM - 6:00 PM	*Option 9:00 AM - 6:00 PM	*Option 9:00 AM - 6:00 PM	*Option 8:00 AM - 1:30 PM	
12:00 PM							
3:00 PM							
6:00 PM							
9:00 PM							

Submit

Also, the manager can see the current status of the employee's preferences

The screenshot displays a user interface for managing employee preferences. On the left, a sidebar titled "Employees Status" contains a search prompt: "Choose employee from the following list to show its preferences:". Below this is a dropdown menu currently showing "Shaked Asher". A list of three employees follows: "Shaked Asher" (with a green checkmark), "Amit Asher", and "Andrio Hanania".

The main area is a calendar for the week of May 22-28, 2022. The days of the week are labeled at the top: Sun 22, Mon 23, Tue 24, Wed 25, Thu 26, Fri 27, and Sat 28. The time slots on the left range from 3:00 AM to 9:00 PM. A blue block labeled "Prefered*" is shown for both Tuesday and Wednesday, covering the time interval from 9:00 AM to 6:00 PM. A "CHEF" dropdown menu is located in the top right corner of the calendar area.

	Sun 22	Mon 23	Tue 24	Wed 25	Thu 26	Fri 27	Sat 28
3:00 AM							
6:00 AM							
9:00 AM			Prefered* 9:00 AM - 6:00 PM	Prefered* 9:00 AM - 6:00 PM			
12:00 PM							
3:00 PM							
6:00 PM							
9:00 PM							

4. The manager will trigger the evolution engine to solve the scheduling problem.


population size elitism

Selection


Crossover

[Add Mutation +](#)

Mutation




Mutation




[Add Termination Condition +](#)


Termination Condition



Termination Condition



Termination Condition

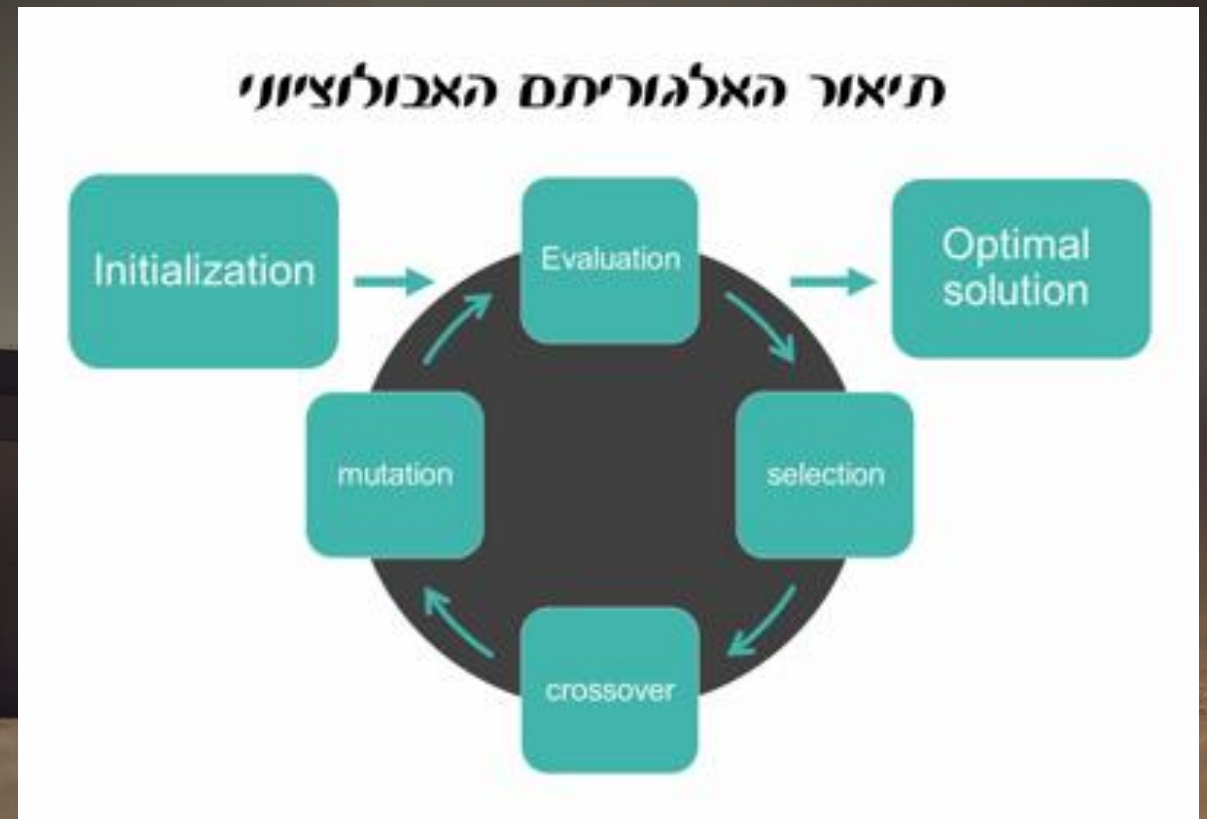


Evolution and shifts scheduling?

Each possible arrangement represents individual solution in the evolution population model.

Every generation (=iteration) the algorithm will produce a finite number of possible arrangements, calculate their fitness and select the best arrangements to survive and continue to the next generation.

When the algorithm finished, the arrangement with the best fitness will return back to the user.



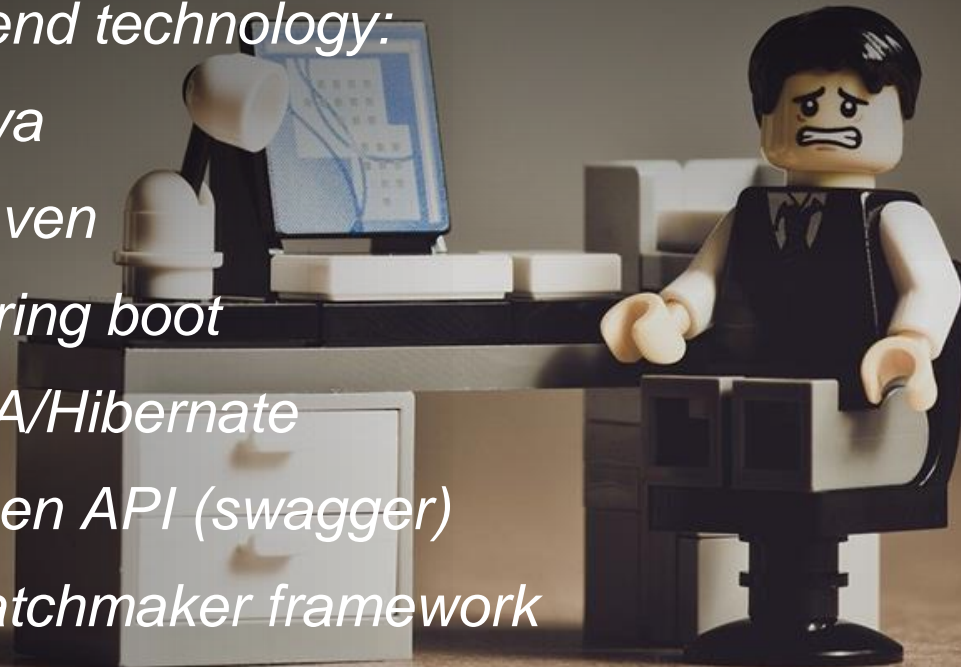
The System Architecture

Frontend technology:

- *React.js*
- *Material UI*
- *Typescript*
- *Mobx (state management)*
- *Swagger codegen*
- *DevExpress*

Backend technology:

- *Java*
- *Maven*
- *Spring boot*
- *JPA/Hibernate*
- *Open API (swagger)*
- *Watchmaker framework*
- *PostgreSQL*
- *JWT*



Evolutionary Shifts

So just sit down...

Relax...

And let us shift your business to success!

