

# Evolutionary Hotel Management

**Programming with Evolutionary Algorithm Workshop**

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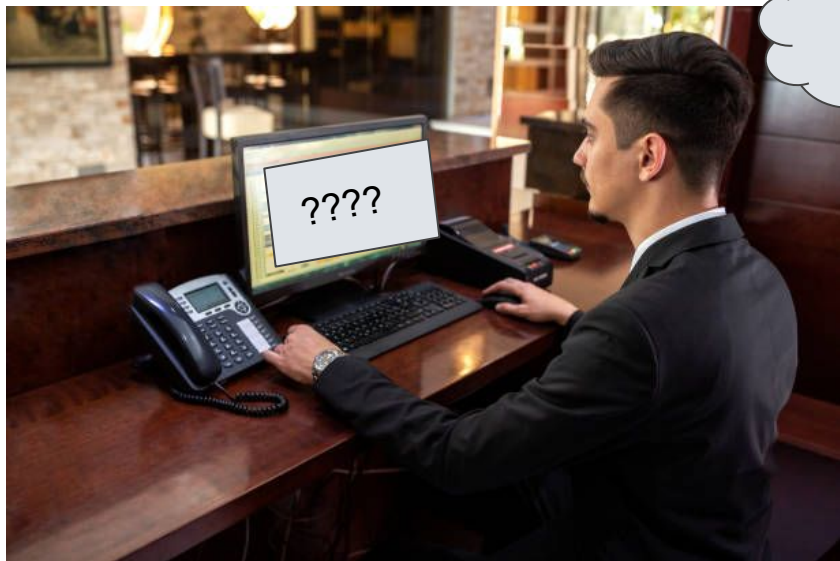
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**Project no: 221105**



# THE PROBLEM

- The problem - guests arrangement in hotel rooms.
- The users - hotel reception managers.

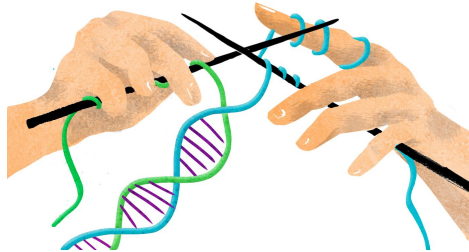


How will I  
arrange  
this??



## THE SOLUTION

- Evolution!



- Our Evolutionary-Algorithm (EA) based system, supplies almost optimal arrangement in a given time!

# Example

## Settings

please select the setting of the evolutionary engine:

please choose the termination condition:

Max duration

please enter the max duration(in seconds)

5

generation count

please enter the number of genera...

Stagnation

please enter the limit number of ge...

Target fitness

please enter the target fitness

Selection Strategy

Rank Selection

Roulette Wheel Selection

Sigma Scaling

Stochastic Universal Sampling

Tournament Selection

Truncation Selection

Selection \*

please enter the elitism

6

Population Size

51

Mutation probability \*

0.3

Date

05/08/2022



SUBMIT AND START THE ALGORITHM

Choose a target date and run the EA engine!

# Example

The screenshot shows a web interface for 'tel management'. A central window titled 'The Assignment' displays a table with two columns: 'Reservation Number' and 'Room Number'. The table contains 13 rows of data. To the left, a sidebar contains various configuration options, including 'Max duration' (checked), 'generation count', 'Stagnation', and 'Target fitness'. A 'Progress %' section shows 100%. To the right, there are buttons for 'SHOW TASKS | ROOMS | RE...' and 'THE ALGORITHM'. Two callout bubbles are present: one on the left saying 'Get the Arrangement!' and one on the right saying 'Simple as that!'.

Reservation Number	Room Number
45	204
46	203
47	105
48	305
49	202
50	103
51	304
52	306
53	108
54	110
55	109
56	310
57	207

# Example

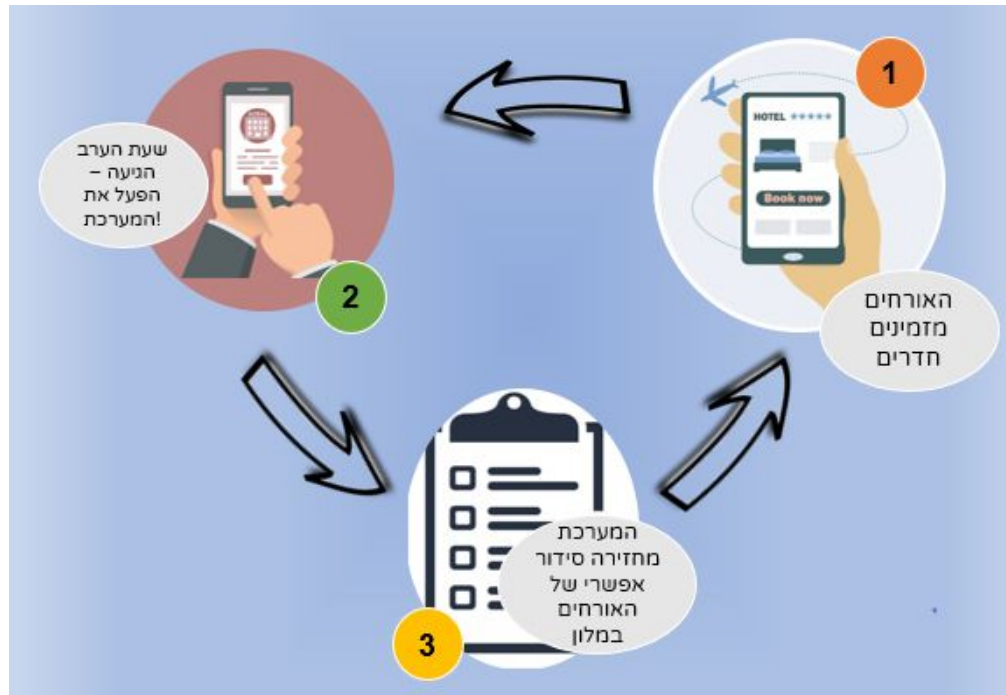
Status	Progress %	Maximum Fitness	Current Fitness	Current Generation	Elapsed Time
done	100	400	366	315	5011

Watch the progress while running

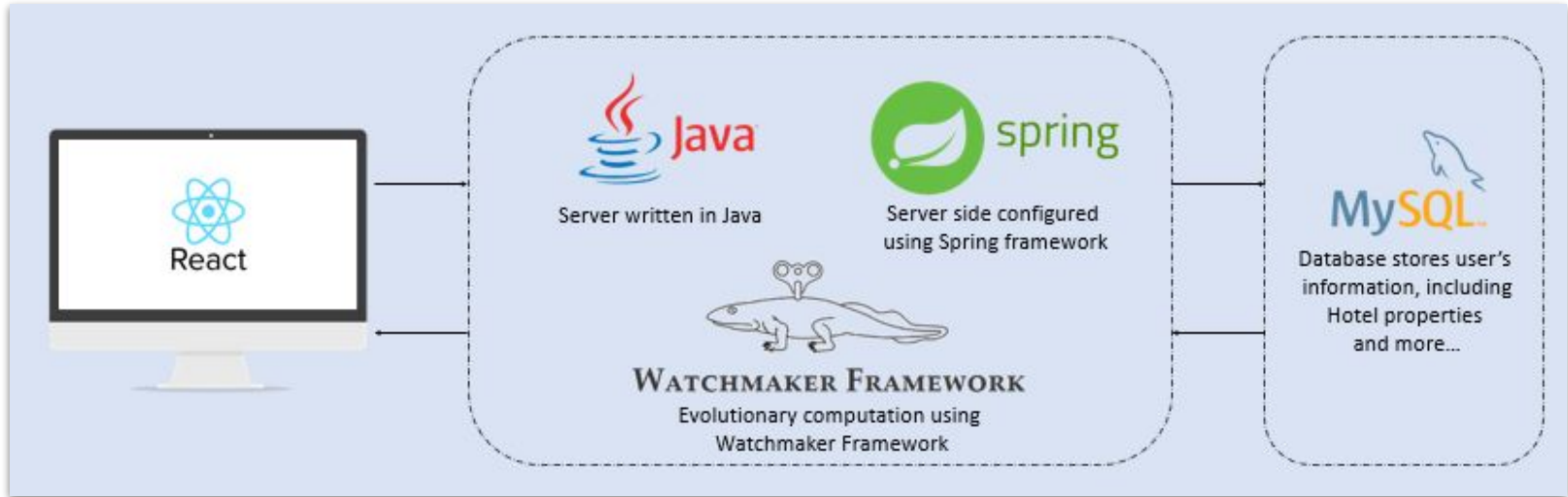


Watch the fitness change

# System Architecture:



# Technologies we used:







## Other Approaches to the Problem:

- Evaluating every assignment and choosing the best assignment - takes time!



- Randomly assigning guests to rooms - not good!
- EA is the most “balanced” approach.





## Summary

- EA can be used to solve many optimization problems.
- Building this project helped us understand common technologies like: React, Spring, MySQL and more.