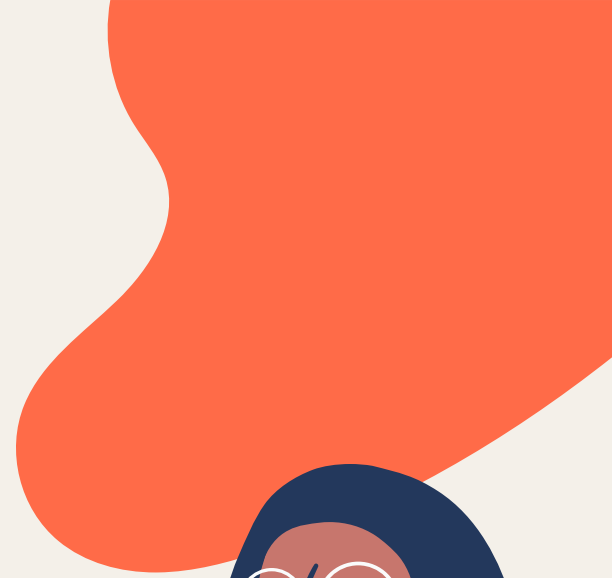
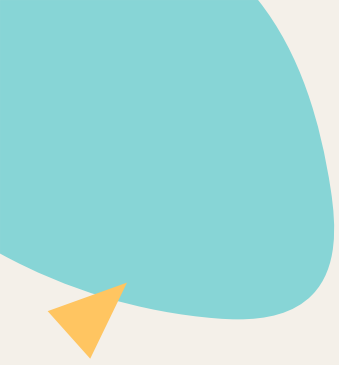


PlaceMe

Placing Pupils in Classes

"The Sorting Hat Saga"



About Us



Team

Aharon Achildiev

Shir Halfon

Gal Yeshua



Project

Project Number: 221008

Evolutionary Algorithm

Mentor: Aviad Cohen



Subject

Placing Pupils
in Classes

Overview





Idea Description

Who are the expected users of the application?

The expected users of our application are school guidance counselors, but it can be used by any other educational staff members.

The problem we're solving

- Placing pupils in classes while taking into consideration several conditions
- It holds a lot of variables which guidance counselors should consider
- This is a tedious issue that guidance counselors deal with every year
- It provides the ability to save the placing information and reuse it

Idea Description

How can EA suit the problem?

- It's considered a good solution for placement problems
- The problem have multiple solutions
- The counselor will decide if the result placement is considered good
- It allows flexibility to add and remove constraints between the different stages
- It allows to use an existing placement as a base for a new one



Implementation



- The pupil's score will be calculated from his/her constraints.
- The requested class score is the average of the sum of the scores in the class.
- Each class of a single individual will be checked by a few rules and will get a bad point if needed.
- The fitness function will calculate the sum of points given to each class.
- An example of a point can be a pupil without a friend in the class, an unbalanced number of males and females in a class, the same pupil in an individual or a class score that is above average score.

Demonstration

Adding pupils to the system

The screenshot displays the 'PlaceMe' Pupils management interface. On the left is a navigation sidebar with the following items: 'Hello, User! (Logout)', 'Pupils ^', 'Groups v', 'Templates v', 'Attributes v', and 'Placements v' (with sub-items 'All Placements' and 'Create New'). The main content area is titled 'Pupils' and includes buttons for 'Import Pupils', 'Export Details', and 'Save Changes'. A table lists existing pupils with columns for Name, ID, and Link. A modal window titled 'Add a new pupil' is open, featuring a numbered list of steps: 1. Pupil's personal details, 2. First contact details, 3. Second contact details, and 4. Personal questionnaire. The first step is active, showing input fields for First Name (Oren), Last Name (Gur), ID (308737678), Birthday (19/05/2015), Gender (Select gender), and Group (Select group).

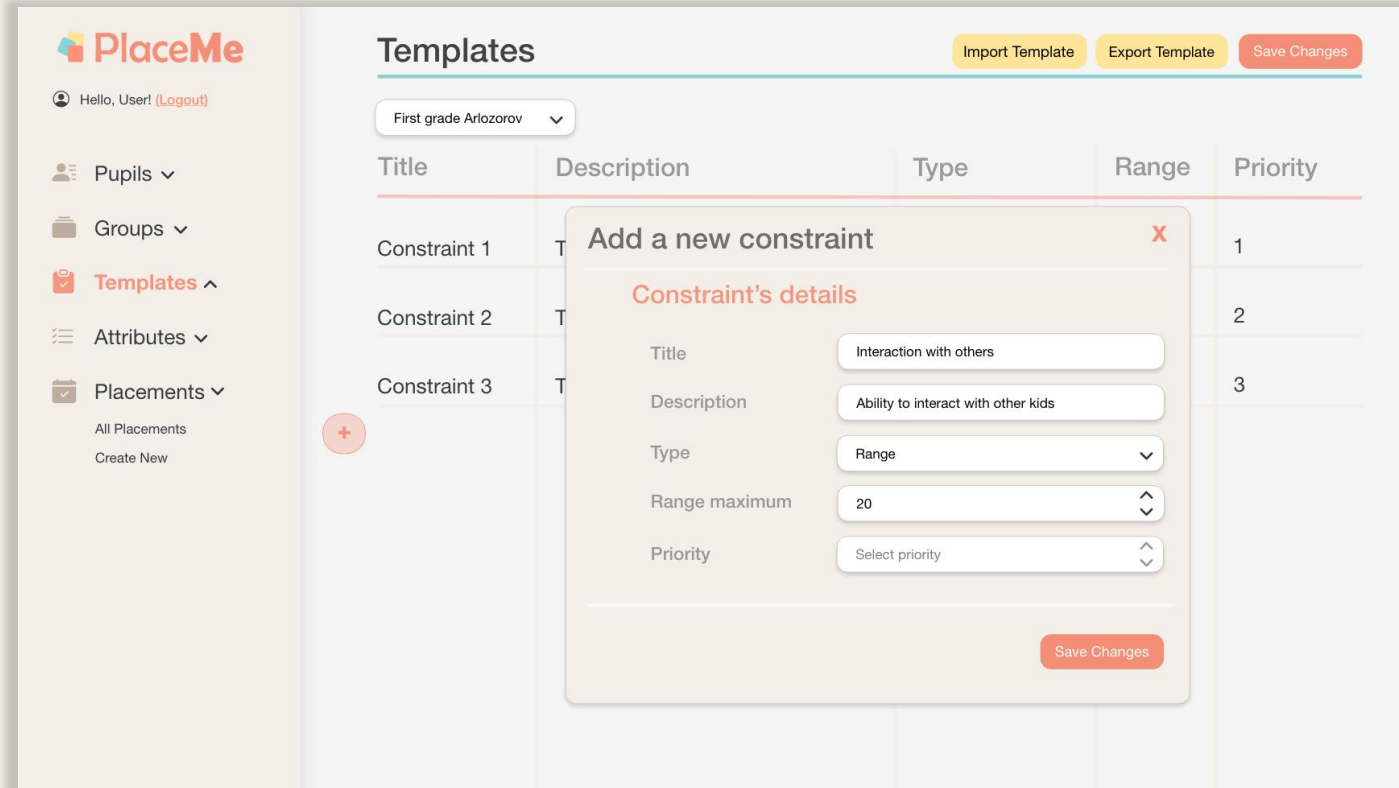
Name	ID	Link
Gal Yeshua	3	Group A
Aharon Achild...	3	Group A
Shir Halfon	3	Group A

Add a new pupil

- Pupil's personal details**
 - First Name:
 - Last Name:
 - ID:
 - Birthday:
 - Gender:
 - Group:
- First contact details
- Second contact details
- Personal questionnaire

Demonstration

Creating constraints template



The screenshot displays the 'PlaceMe' application interface. On the left is a sidebar with navigation options: 'Pupils', 'Groups', 'Templates' (highlighted), 'Attributes', and 'Placements'. The main content area is titled 'Templates' and shows a table of existing constraints. A modal window titled 'Add a new constraint' is open, allowing the user to define a new constraint's details.

PlaceMe
Hello, User! (Logout)

Pupils ▾
Groups ▾
Templates ▲
Attributes ▾
Placements ▾
All Placements
Create New

Templates Import Template Export Template Save Changes

First grade Arlozorov ▾

Title	Description	Type	Range	Priority
Constraint 1	T			1
Constraint 2	T			2
Constraint 3	T			3

Add a new constraint

Constraint's details

Title:

Description:

Type:

Range maximum:

Priority:

Save Changes

Demonstration

Final placement result view

The screenshot displays the 'Placement View' interface in the PlaceMe application. The interface includes a sidebar on the left with navigation options: Pupils, Groups, Templates, Attributes, and Placements (selected). The main content area shows the 'Placement View' for 'Mekif A' school and '54' grade. It displays five classes, each with a list of pupils and their status indicators (yellow and red dots).

PlaceMe
Hello, User! (Logout)

Placement View Export Details Save Changes

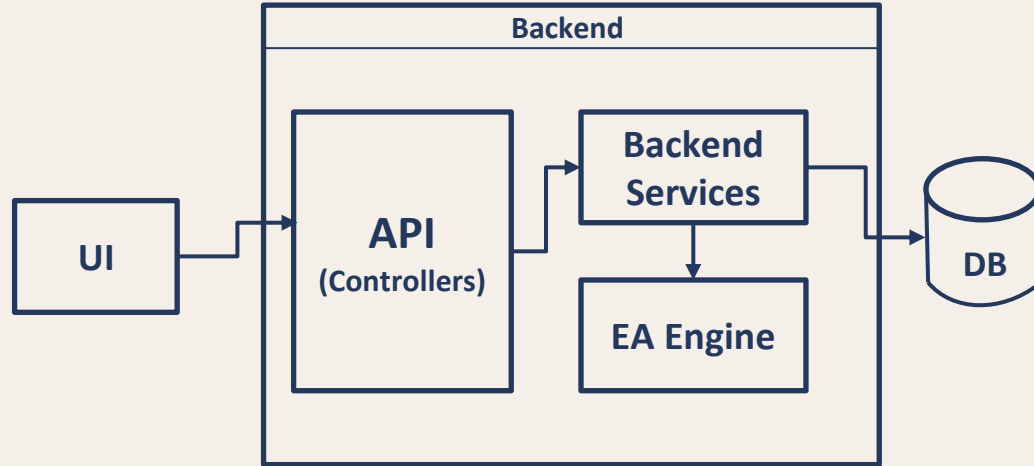
School: Grade:

Class 1	Class 2	Class 3	Class 4	Class 5
<ul style="list-style-type: none">Aharon AchildievGal YeshuaShir HalfonMaurice BenitezRoss BryanDaniella RamosZoey ProctorLucy LambJosue Briggs	<ul style="list-style-type: none">Braiden ReidSanai LambRalph WintersCharlotte NielsenJimena FerrellLauryn SloanMattie WolfKash Conrad	<ul style="list-style-type: none">Jayla PowellBrooke SheaAimee BoyerNolan KochValentina IngramHarrison GrimesIsabela SchaeferDesmond RobbinsBria KanePreston Giles	<ul style="list-style-type: none">Moriah BoyerVicente KimBailey TravisAniya McdanielBlaine ClementsLizeth NelsonPeyton JuarezTate SalasDeegan Shields	<ul style="list-style-type: none">Aharon AchildievGal YeshuaShir HalfonMaurice BenitezRoss BryanDaniella RamosZoey ProctorLucy LambJosue Briggs

High-Level Design



Technologies and Architecture



Java Spring
Boot
+
Hibernate

MySQL

Jenetics
framework
for EA

React

Bootstrap



Possible Solutions

Other possible solutions for this problem



- Manual placing by the guidance counselor – Too tedious
- Placing by Naïve algorithm – Not flexible enough
- Placing by Greedy algorithm – Inconsistent quality of results

The advantage of the EA solution and PlaceMe

- This solution is simple for the user and doesn't require much thinking
- PlaceMe allows the school staff to manage placements in an intuitive way
- It allows to save ,manage import and export all the pupils' details

Summary



- This project is a classic solution of a common placing problem using evolutionary algorithm. This solution provides a simple process for placing while taking into consideration any constraints and providing the required flexibility to make any manual changes.
 - We used the latest version of technologies (Java, MySQL and React).
 - We also developed a flexible API that allows managing pupils, classes and placement, import and export the data and adjusted the algorithm according to the required use case.
 - We designed an intuitive and comfortable UI for schools' different staff members.
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Thank You

Well, if you're sure, better be... GRYFFINDOR!

