Caseine: an open pedagogical environment and a teaching community

Hadrien Cambazard, Nicolas Catusse, Nadia Brauner
A training platform

• Help learning process
• Increase engagement and autonomy of students
• Better use of teacher time
• Improve the quality of the contents
  – (sharing = reviewing from others)
• Improve visibility of the contents
  – (communication)

caseine.org
3 components

• monitor students' progress,
• share contents between the teachers
• automatically evaluate
  – computer code
  – mathematical models
  – classical and advanced quizzes
A pedagogical environment
A pedagogical environment

• Do you use Moodle?
  
Yes  ✔

No  ❌
A pedagogical environment

OPL User guide: Modeling LP problems with OPL with external data

- Production of wines with external data
- Bill Of Materials

Skills Solving

Recognize the canonical and standard forms and know the transformations

Linearize an objective function of the form maximum of a minimum or minimum of a maximum

- Playing with forms
- Forms step by step

Solve graphically an LP with two variables:

- draw the feasible region
- draw the level lines for the objective function
- find the optimal solution(s) on the graphic

Draw LPs in 2D with Geogebra
A pedagogical environment

- Based on Moodle
- Plugin development
  - Completion levels
  - Likes
  - Ski run color
A pedagogical environment

• Open to academic community: edugain connexion
Sharing between teachers
Sharing contents between teachers

• License which allows sharing (CC, open...)
• Each teacher remains owner of their content
• Each teacher chooses to share or not
• A shared space *i.e.* a feature to easily:
  – Tag/mark your activities with relevant information for sharing
  – Share your activities
  – Search among the shared activities
Sharing space

- Activity shared to teaching community

Search all the platform

- Search by keywords
  - No selection
  - Search

Advanced Search Form

- Search by moodle identifiers
  - Module Id
    - No selection
    - Search
  - Module Name
    - No selection
    - Search
  - Course Name
    - No selection
## Sharing space

### Result: 232

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<td>Hadrien Cambazard, Nicolas Catusse, Pierre Lemaire</td>
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The community of teachers

- Sharing space
- Discussions
- Caseine days – distant seminars
- Newsletter
- Thematic community of teachers
  - Python, Java, SQL, OR...
  - Computer science in high school
  - math
Automatic evaluation
Automatic evaluation

• Do you teach computer science or math?

  yes

  no
Indicate which of the following topological ordering is correct for this graph?

With the correct topological ordering, apply the shortest path algorithm starting from 'a' and complete the second line of the table with the final values (the first line of the table contains the vertices following the topological order).

To express an 'infinite' distance, use: '+INF'.

<table>
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<tr>
<th>a</th>
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Automatic evaluation

• Based on VPL tool
  – A Moodle plugin
  – vpl.dis.ulpgc.es

• Used on caseine for
  – LP, MIP models, CP models
  – Dynamic programming
  – Graph algorithms and data structures
  – Basic and advanced programming
    • Java, Python, C...
  – R

• Evaluation systems: Java Junit, Python Unittest, SQL...

• Experimental code complexity
Plugin developed by Juan Carlos Rodríguez del Pino

```java
public WeightedGraph kruskalUFTable() {
    WeightedGraph theTree = new WeightedGraph(n);
    UFTable uf = new UFTable(n);
    Edge[] theEdges = edgelist(); // A comment from the teacher
    Arrays.sort(theEdges);
    for (Edge e : theEdges) {
        int u = e.oneVertex();
        int v = e.theOtherVertex(u);
        if (!uf.sameClass(u, v)) {
            theTree.addEdge(e);
            uf.union(u, v);
        }
    }
    return theTree;
}
```

```java
/**
 * @return a minimum spanning tree with Kruskal algorithm
 * Using an object of the UFTable class
 * Hint: since the Edge class implements Comparable, you can sort the edges stored in an Ar
 */
```
Complétez la fonction suivante, qui affiche les n premiers nombres de la suite de Fibonacci.

Pour rappel, cette suite est définie par :

- $f(1) = 1$
- $f(2) = 1$
- $f(n) = f(n-2) + f(n-1), \forall n > 2$

```python
1. def fibonacci(n):
2.     f1=1
3.     f2=0
4.     i=1
5.     while i<=n:
6.         print(f1)
7.         tmp=f1+f2
8.         f2=f1
9.         f1=tmp
10.        i+=1
```
Eclipse plugin
Eclipse plugin
Students and teachers
Students in courses from...

• Novosibirsk State University
• AFEKA, Tel-Aviv
• Université de Louvain
• Grenoble-INP
• Université Grenoble-Alpes
• Université Clermont-Auvergne
• Université d'Avignon
• INSA de Lyon
• Université de Caen Normandie
• Université de Haute-Alsace
• Lycée Claudel, Ottawa, Canada
• Lycée fr de Santa Cruz, Bolivia
• Lycée Champollion (Grenoble)
• Lycée A. Croizat (Moutiers)
• Lycée Marliz (Aix les Bains)
• Lycée Les Catalins (Montélimar)
• Lycée Blaise Pascal (Clermont-Ferrand)
• Lycée Théodore de Banville (Moulins)
• Lycée Blaise Pascal (Ambert)

Numbers in 19-20: 7300 connected users
~ 1000 users per day
The teacher community of caseine

• Access to open courses: Free for initial university courses and individual training

• Creating a course
  – Free for initial university courses
  – Contribution to costs for lifelong university training (formation continue)
  – Paying service for companies which sell formations

• Terms
  – Everyone is author of its creations
  – Everyone can choose to share or not
  – Moodle developments (shared plugins)
  – Caseine specific developments
Variety of usages

Support for « active classrooms » but as many practices as there are teachers:

- Autonomy
  - Personal work
- Autonomy
  - Team work
- Autonomy
  - Personal work at home
- Individual
  - Evaluation

Support to conduct a *flipped* classroom

Traditional classroom with validation in autonomy

Only one agreement: focus on *student’s active role*
Core team

Hadrien Cambazard (pilote, Java + RO)
Aurélie Lagoutte (Python)
Anne-Laure Ladier (RO)
Florent Paccalet (développeur)
Florence Thiard (Ingénieure)
Nicolas Catusse (pilote, Java + RO)
Pierre Lemaire (R)
Christophe Saint-Marcel (Design Pattern)
Elise Arnaud (Maths)

Nadia Brauner (pilote, RO)
Bernard Penz (RO)
Denis Bouhineau (Algo/Prog)
Florent Bouchez Tichadou (Algo/Prog)
Yvan Maillot (Java, design patterns, plugin concepteur)

Fabrice Ménard (Ingénieur pédagogique)
Julie Peyre (Java)
Céline Fouard (Langage pour le Web)
Astor Bizard (Ingé. en développement)
The teacher community of Caseine

• How to join
  – Create an account (your existing academic login might work)
  – Have a look to the discover course
  – Have a look at the open courses (e.g. OR course)
  – Express your will (send an email) for starting a course and have access to the shared space and the tutorials.

• Support and training for a start...
A training platform

- Help learning process
- Increase engagement and autonomy of students
- Better use of teacher time
- Improve the quality of the contents
- Improve visibility of the contents

support.caseine@grenoble-inp.f
A 3-minute tour

• https://caseine.org/mod/page/view.php?id=19571