Ton Duc Thang University
Faculty of Information Technology

PRESENTATION – PROGRESS II

Course: Introduction to Artificial Intelligence

Duration: 03 weeks

I. Formation

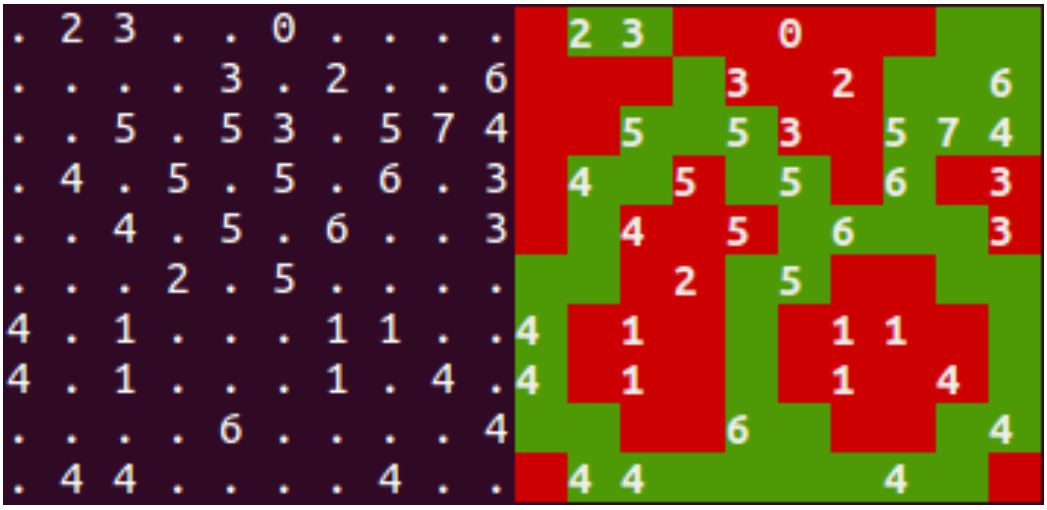
- The presentation is conducted in groups of 04 – 05 students.
- Student groups conduct required tasks and submit the project following instructions.

II. Requirements

Students implement a program to solve the problem below using Google Colab.

Description:

- Given a matrix of m x n, a cell consists of a non-negative integer or it is blank.
- Each cell has 9 "adjacent" neighbors, including itself and 8 cells around.
- Players color cells by red or green so that the number of green cells which are "adjacent" to a cell is exactly the number inside.
- There is no constraint for blank cells.



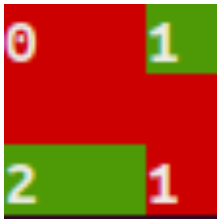
Input data file (left) – Result (right)

- Use propositional logic to solve the problem
  - Assign a propositional symbol to each cell (true → green, false → red)
  - Enumerate cells to generate CNF clauses representing constraints.

- Find a model satisfying all clauses using Glucose3 of PySAT.

```
pip install python-sat==0.1.7.dev12
```

- Example input and output.

input.txt (space-seperated)	output (terminal)
3 3 0 . 1 . . . 2 . 1	

- Hint:
  - Use biconditional sentences to represent constraints

$$a \wedge b \Leftrightarrow -c \wedge -d \wedge -e$$

  - Eliminate biconditional connectives
  - Discover the rules of symbol combinations
  - Use the **itertools** module to generate clauses automatically
  - Find a model using Glucose3

a) Implementation (8.0 points)

- Implement a program to solve the problem above.

b) Presentation (2.0 points)

- Student groups compose a presentation to report your work.
- **THERE IS NO PRESENTATION TEMPLATES. STUDENTS ARANGE CONTENTS IN A LOGICAL LAYOUT BY YOURSELVES.**
- The presentation must include below contents
  - Student list: Student ID, Full name, Email, Assigned tasks, Complete percentage.
  - Briefly present approaches to solve tasks, should make use of pseudo code/diagrams.
  - AVOID EMBEDDING RAW SOURCE CODE IN THE PRESENTATION.
  - Study topics are introduced briefly with practical examples.

- Advantages versus disadvantages
- A table of complete percentages for each task.
- References are presented in IEEE format.

- **Format requirements:** slide ratio of 4x3, avoid using dark background/colorful shapes because of projector quality, students ensure contents are clear enough when printing the presentation in grayscale.
- Presentation duration is **10 minutes**.

III. Submission Instructions

- Create a folder whose name is as

  <Student ID 1>_< Student ID 2>_< Student ID 3>_< Student ID 4>

- Content:
  - **source** → source code folder (containing .ipynb files)
  - **presentation.pdf** → presentation.
- Compress the folder to a zip file and submit by the deadline.

IV. Policy

- **Student groups submitting late get 0.0 points for each member.**
- **Wrong student IDs in the submission filename cause 0.0 points for the corresponding students.**
- **Missing required materials in the submission loses at least 50% points of the presentation.**
- **Copying source code on the internet/other students, sharing your work with other groups, etc. cause 0.0 points for all related groups.**
- **If there exist any signs of illegal copying or sharing of the assignment, then extra interviews are conducted to verify student groups' work.**

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