Instructions for the course on Intellectual Output 3

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Linear Programming

- Question 2 in page 12 asks the students to visit a website and define a problem. The following slides illustrate the process

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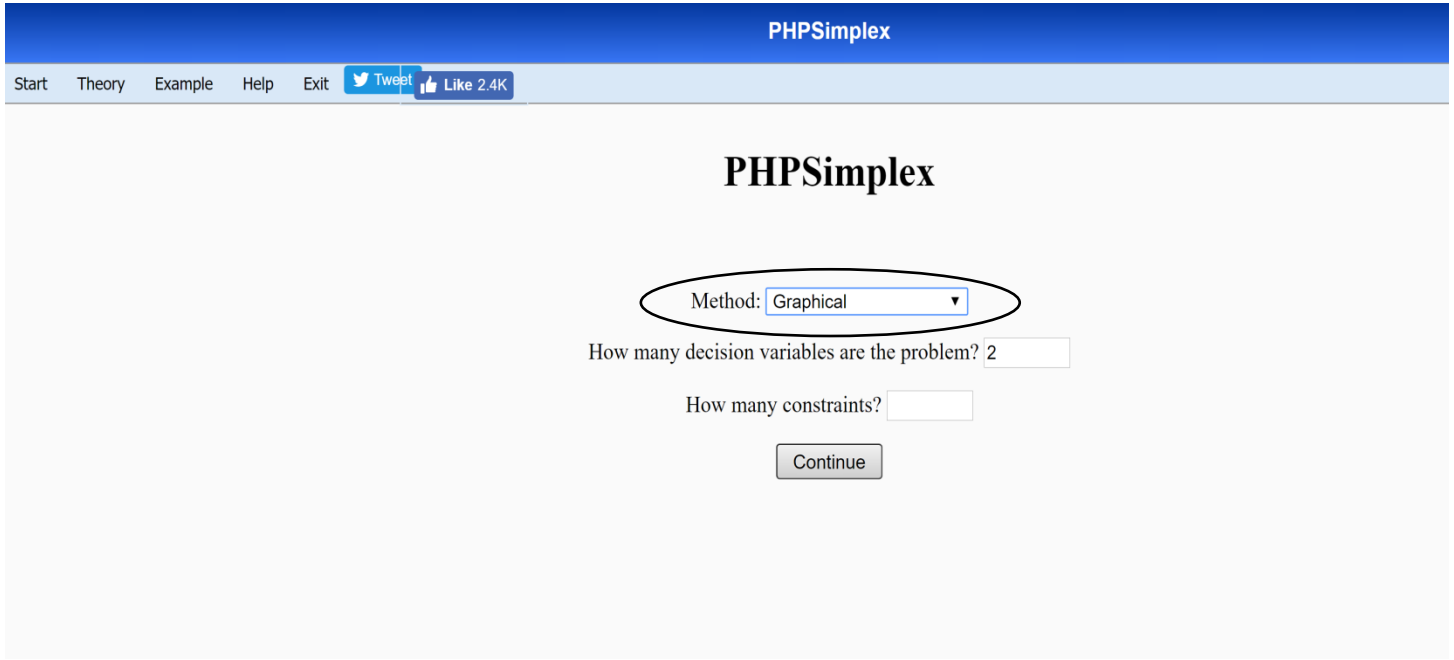
Linear Programming

- http://www.phpsimplex.com/simplex/simplex.htm?l=en



- From the dropdown menu, select Graphical

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Linear Programming

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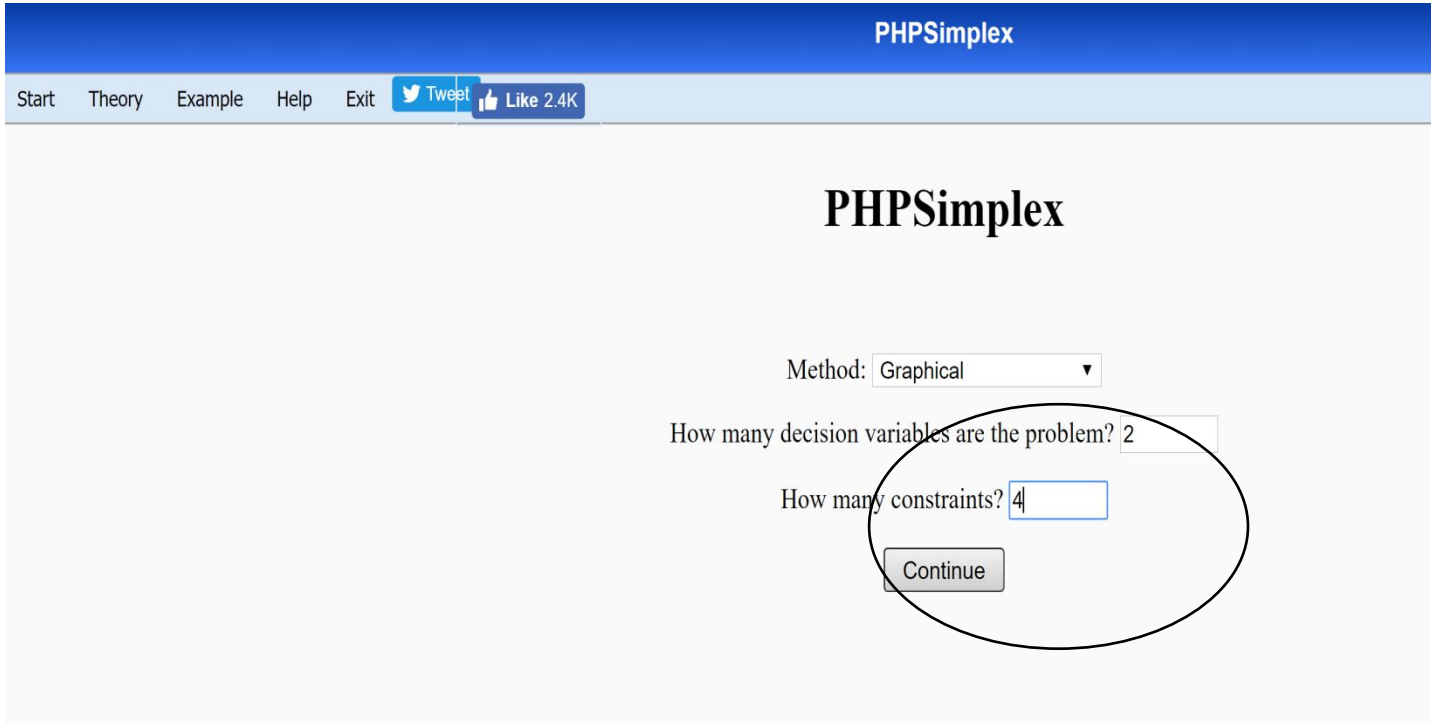

- By choosing the Graphical method, the system automatically assigns two decision variables. Ask students why?

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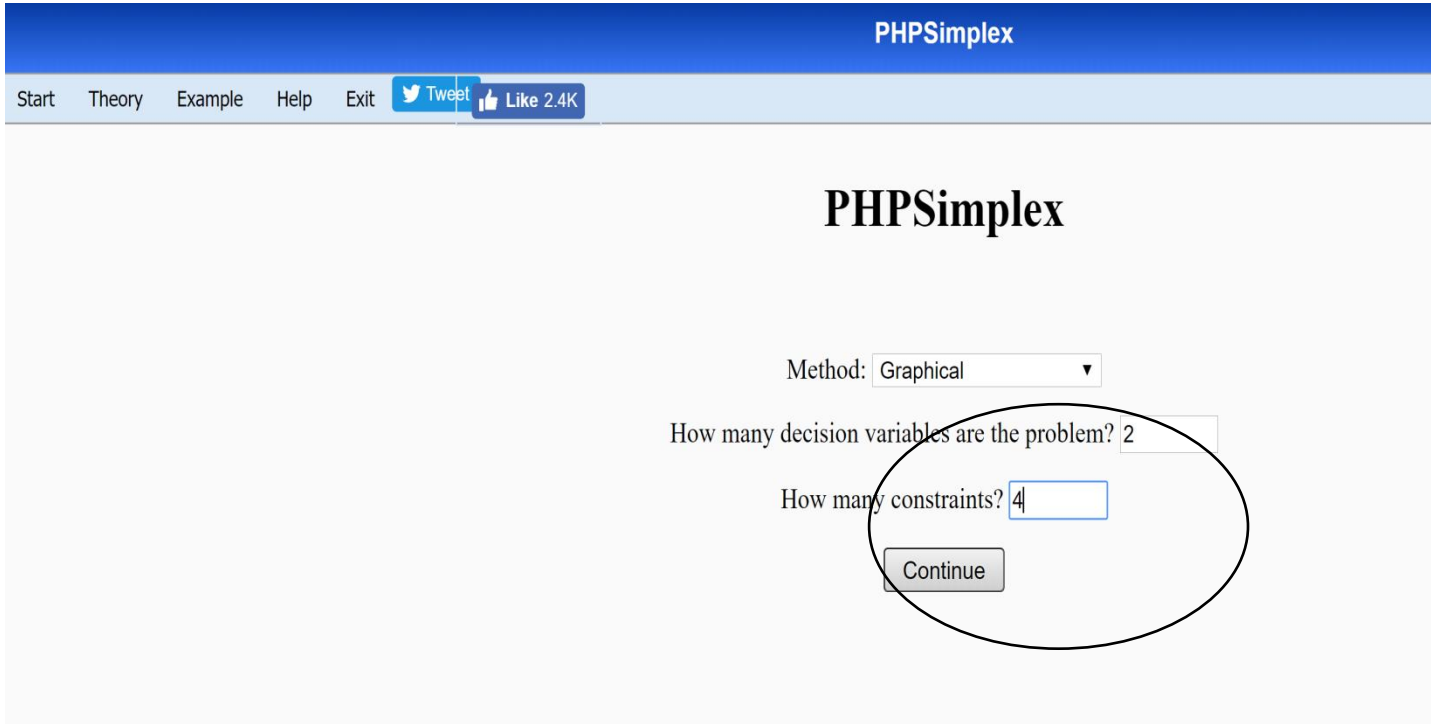
SUSTAIN GAME-BASED LEARNING ON URBAN SUSTAINABILITY

Linear Programming

- http://www.phpsimplex.com/simplex/simplex.htm?l=en



- Choose 4 constraints and press continue

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Linear Programming

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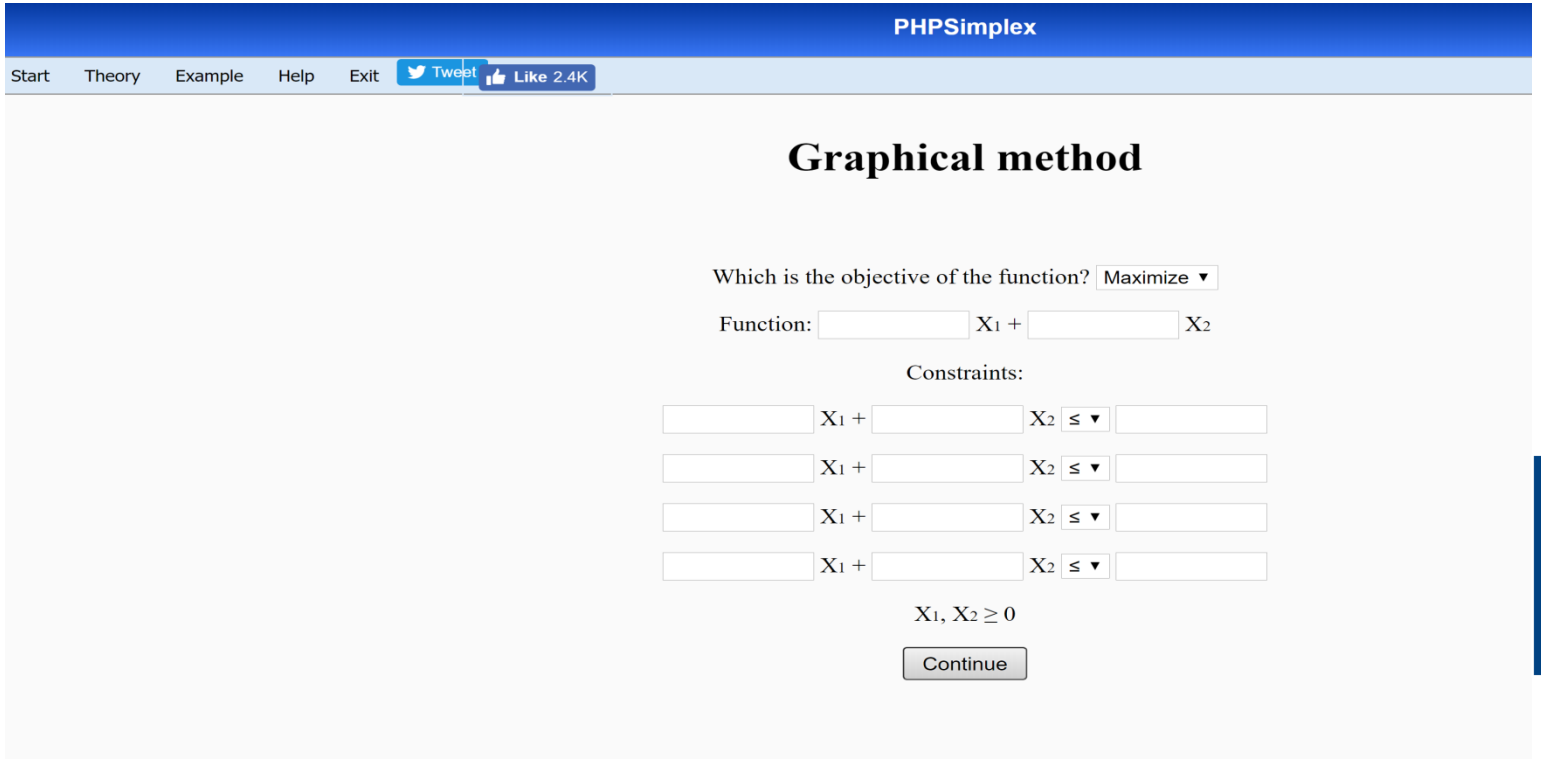

- Ask the students to fill the cells with values and press continue

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Linear Programming

- http://www.phpsimplex.com/simplex/simplex.htm?l=en

- Ask the students to explain the results from their problems

- After successfully explaining the results, ask the students to come up with a real-life problem that fits the data that they have filled in the cells

SUSTAIN GAME-BASED LEARNING ON URBAN SUSTAINABILITY

Linear Programming

- http://www.phpsimplex.com/simplex/simplex.htm?l=en

- For the minimization problem of page 13-14, ask the students to solve the problem manually
- As validation ask the students to use the website to obtain the results for the minimization problem

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Linear Programming

- Before the python code give the students the following free material to get in touch with the Python Logic:
  - https://automatetheboringstuff.com/ (The author has uploaded the whole book chapter by chapter)
  - https://greenteapress.com/wp/think-python-2e/ (The author has the book available in pdf and the users can contribute with a sum)

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Linear Programming

- For the python code, read it line by line and show how the mathematical equations are transformed into programming lines

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Data Envelopment Analysis

- The part of the DEA method is written as a step-by-step guide. The students could read it through and by making the exercises at every step they will have no problem to understand the basic notions of efficiency and DEA, produce the mathematical formulations, solve them in Excel and interpret the results

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Data Envelopment Analysis

- Ask the students what is the difference between Linear Programming and Data Envelopment Analysis
  - DEA can be formed as a Maximization/Minimization Problem
  - The objective function in the technical efficiency
  - The problem seeks the values of λ that maximize efficiency

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PROMETHEE & AHP

- PROMETHEE and AHP are explained analytically
- The exercises/examples are solved step-by-step

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Interactive Exercises

- The following link contains some of the exercises of the output in an interactive form. The students must press the link

https://drive.google.com/file/d/1P5oK093I8b8QSL-YvpAMghU7hXDwUfsM/view?usp=sharing

- The user must press: “Open with Collaboratory” in order to access the Notebook with the interactive exercises

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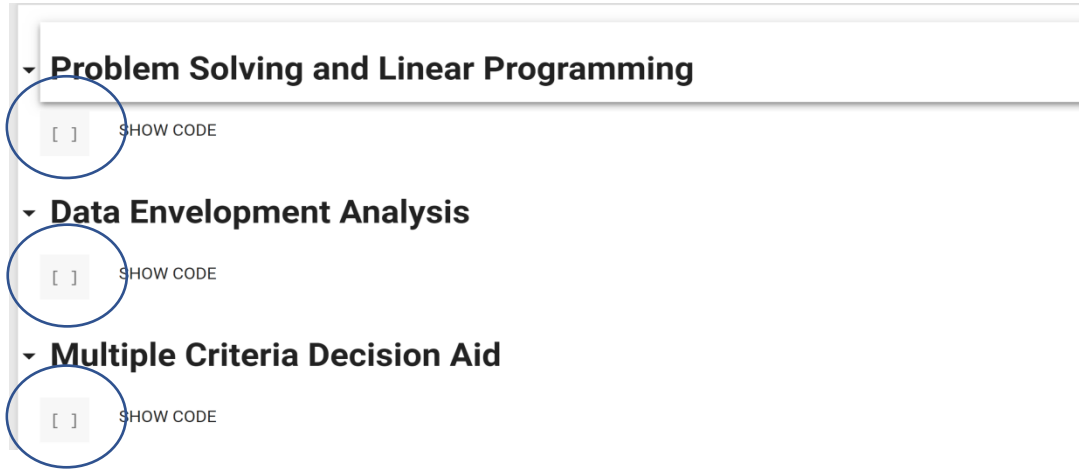
Interactive Exercises

- The first page that opens is the following:



- In each of the three sections, the students must press the Play button and the system will generate the questions (circles in the picture)

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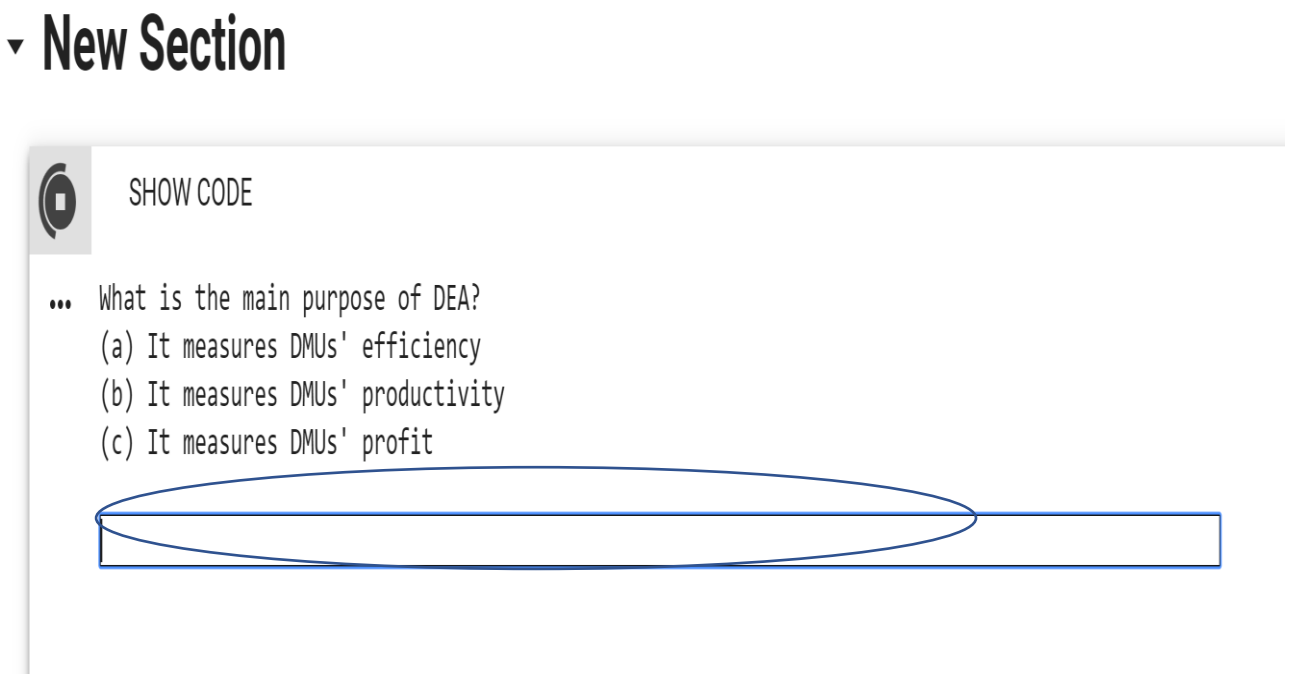
Interactive Exercises

- The students must type their answer in the cell and press enter. The question will continue until all are answered and the system will provide a final assessment of the student. The student has the option of not answering- simply press enter to continue



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