AIDM Lab 2

January 2025

Part 1

1. Download and install AMPL Community Edition from here:
   `https://portal.ampl.com/download/ampl/bundle/d60675fe-a985-4dce-a846-d5c27d849dca`
2. In a Jupyter notebook or (your preferred Python IDE) run
   `pip install amplpy`
3. Test that your installation was successful by running the following commands without errors:
   ```
   from amplpy import AMPL
   ampl = AMPL() # instantiate AMPL object
   ```
4. Read the "A Production Planning Problem" notebook at
   `https://github.com/fdabrandao/MO-book-with-AMPL/blob/dev/notebooks/01/production-planning.ipynb`
5. Complete the tutorial by following the steps at
   `https://github.com/fdabrandao/MO-book-with-AMPL/blob/dev/notebooks/01/production-planning-basic.ipynb`

Part 2

We want to pack as many pieces of fruit (apples and bananas) as possible into a box, given that (i) no more than 4 bananas must be packed; (ii) no more than 9 apples must be packed; (iii) the number of bananas must be no more than twice but no less than half the number of apples.

1. Model this problem using LP.
2. Solve the problem using AMPL.
3. Draw a graph to represent your model using pen and paper or any software tool. Show the feasible region and the optimal solution. Which constraints are redundant, if any? How many apples and bananas should we pack into the crate?

Submit a Jupyter notebook containing only Part 2 of the lab before next week's lab.