

Name: _____

Quiz 2

MAT 334 Intermediate Deterministic Models

27 January 2026

You may use:

- your own IDM course notes
- your own IDM homework
- any of the built-in help within Spyder (or Jupyter if you are using that)

You may not use any other sources.

Question 1 requires the use of your computer. When you are done with Question 1, upload the .dat and .py files to the Canvas Quiz 2 assignment page, close your computer and obtain the sheet with Questions 2 and 3 from your instructor.

Questions 2 and 3 ask you what a given list comprehension will produce and to write a dictionary comprehension meeting certain requirements, respectively. **These are to be done by hand on the sheet to be provided. You may not use your computer for them. Hand in both sheets when you are finished.**

1. (8 points) The formulation of a linear program about producing two types of furniture out of wood and using labor is shown below. Each decision variable represents how much of each type to make. The objective is to maximize revenue and includes the price for each type of furniture.

$$\begin{aligned} &\text{Maximize: } z = 120x_1 + 80x_2 \\ &\text{subject to: } \quad 2x_1 + x_2 \leq 6 \quad \text{linear feet of wood} \\ &\quad \quad \quad 7x_1 + 8x_2 \leq 28 \quad \text{hours of labor} \end{aligned}$$

For this question:

- Set up an AMPL .dat file named "furniture.dat" containing this data as follows:
 - Create **ampl** *sets* for the furniture and resources, using those exact names for those sets.
 - Create the following **ampl** *parameters* using the names specified in quotes and taking care to index each parameter logically based on the structure of the data and the sets defined above.
 - * "avail" for the amount of each resource available
 - * "prices" for the price of each piece of furniture
 - * "required" for the amount of each resource required in making each type of furniture
- Set up a python file named "furn-lp.py" that loads the data into an **Ampl** object named **data**.
- You should check to make sure the contents loaded in correctly from the .dat file to your **data** **Ampl** object.

- There is no LP nor IP to set up, no need to use PuLP; just set up the **amply** portion as described above.

*Note: your code will be run and checked with **assert** statements. For instance, if we were using the hot tub data, the test statements would look like:*

```
assert data.products == ['Aqua', 'Hydro']  
assert data.profit == {'Aqua': 350.0, 'Hydro': 300.0}
```

etc.

Request Questions 2 and 3 from your instructor when you finish Question 1, have uploaded the files and closed your computer.

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2. (1 point) For the following comprehension, what would be displayed if `print(x)` were to follow the given line of code?

```
x = [[u*f for u in range(1,3)] for f in [1,2,5]]
```

3. (1 point) Write a dictionary comprehension whose keys are integers from 1-7 inclusive and values are `True` if the key is divisible by 3 and `False` otherwise.