IDM SPR 2026 **QUIZ 4** (15 points) **NAME** KEY

You may use:

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

You **may not** use any other sources. You **may not** collaborate with anyone else whatsoever.

1. Assume the following problem is to be formulated in the same manner as the olive oil problem covered in class. Sketch the **time-based** network diagram that would result (not the simple structural network). **(7 points)**
   - Label each node with its proper label (letter or name for location, week).
   - Draw in all arcs including inventory arcs, if any, **but if flow could not possibly go through or from a node or arc in a feasible solution, do not include that node or arc in the diagram.**
   - You **do not need to** label arcs, costs, nor capacities.

DO NOT SOLVE the MPTP, just sketch the diagram.

Transport and Handling Costs ($/barrel)

FROM \ TO	Ballas	Columbia	Richmond
Arlington	42	36	
Ballas			49
Columbia			55

Supply over Time (barrels)

	W1	W2
Arlington	100	25

Inventory Holding Capacity

	Capacity	Cost/Barrel
Richmond	50	1

Demand over Time (barrels)

	W4
Richmond	100

Transportation Arc Capacity

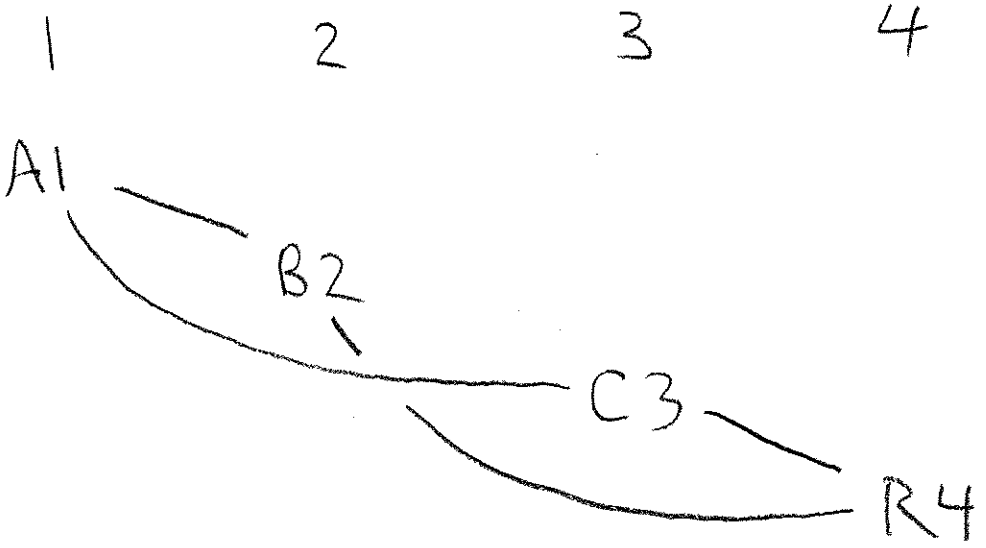
	Capacity
All Arcs	75

Transportation Lead Times (weeks)

FROM \ TO	Ballas	Columbia	Richmond
Arlington	1	2	
Ballas			2
Columbia			1

Week -- >

Location ↓



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2. This problem refers to the `mp_transhsip.py code` and associated `data/mptp_data_01.dat` file from the course repo lecture multiperiod transshipment folder. + reposted in the quiz 04 folder **(8 points)**

   a. Run the code, which should result in an optimal solution, and report the following:

      i. optimal values of these variables corresponding to the number of barrels of oil transported between:

         1. KCI week 1 and NRF week 2 100
         2. CHI week 2 and NRF week 4 0
         3. SJU week 6 and SJU week 7 50

      ii. Did the flow reach maximum capacity on any transportation (not inventory) arc? If so, which one(s)? No. All < the capacity of 300.

   b. In the dat file, change Panama's week 4 demand from 100 to 125. Save the dat file, point the code to the revised dat file, re-run the code and answer the following:

      i. optimal objective value 77,762.5

      ii. optimal values of these variables:

         1. x_(CHI_1)_(HOU_3) 125
         2. x_(CHI_2_(HOU_4) 100
         3. x_(PAN_6)_(PAN_7) 37.5