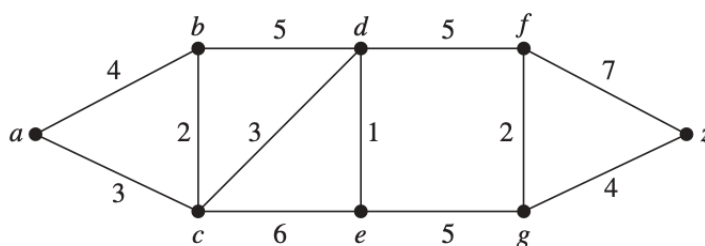


Due on Monday, June 3

Please read the homework directions and advice on the syllabus!

Required Exercises for Submission (upload as a single PDF on Canvas):

- Consider the following weighted graph. Produce a minimum-weight spanning tree using each of (a) Kruskal's algorithm, (2) Prim's algorithm, and (3) Lukas's algorithm (aka. Reverse-delete). Make sure to indicate your steps in order.



For the next three problems, take inspiration from the proof for Kruskal's algorithm. What changes here?

- Prove that Prim's algorithm produces a spanning tree of any given connected graph.
- Prove that the spanning tree produced by Prim's algorithm is of minimum weight
- Prove that Lukas's algorithm produces a minimum-weight spanning tree (Hint: spanning tree is now very easy. For minimum weight, again, take inspiration from the proof of Kruskal's).
- Solve following exercises from the textbook (Rosen) section 10.6: **17, 27**. For both exercises, make clear ALL the steps of Dijkstra's algorithm in order.
- Solve following exercises from the textbook (Rosen) section 11.4: **17, 19, 21, 25**.

Recommended exercises (Do not submit; some solutions at the end of the book):

- Sec 10.6: **18, 24**.
- Sec 11.4: **16, 22, 30**.

Happy mathing!