Quiz 3 Standard 3 - Dijkstra's Algorithm

Due Date ....Thursday Sep 22, 8pm MT
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Quiz Code (enter in Canvas to get access to the LaTeX template) .... **YUIOP**

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Instructions

- You may either type your work using this template, or you may handwrite your work and embed it as an image in this template. **If you choose to handwrite your work, the image must be legible, and oriented so that we do not have to rotate our screens to grade your work.** We have included some helpful LaTeX commands for including and rotating images commented out near the end of the LaTeX template.

- You should submit your work through the **class Gradescope page** only. Please submit one PDF file, compiled using this LATEX template.

- You may not need a full page for your solutions; pagebreaks are there to help Gradescope automatically find where each problem is. Even if you do not attempt every problem, please submit this document with no fewer pages than the blank template (or Gradescope has issues with it).

- You **may not collaborate with other students**. **Copying from any source is an Honor Code violation. Furthermore, all submissions must be in your own words and reflect your understanding of the material.** If there is any confusion about this policy, it is your responsibility to clarify before the due date.

- Posting to **any** service including, but not limited to Chegg, Discord, Reddit, StackExchange, etc., for help on an assignment is a violation of the Honor Code.

- You **must** virtually sign the Honor Code (see Section). Failure to do so will result in your assignment not being graded.

Honor Code (Make Sure to Virtually Sign)

Problem HC.
- My submission is in my own words and reflects my understanding of the material.

- Any collaborations and external sources have been clearly cited in this document.

- I have not posted to external services including, but not limited to Chegg, Reddit, StackExchange, etc.

- I have neither copied nor provided others solutions they can copy.

Agreed (I agree to the above, Blake Raphael). □

3 Standard 3 - Dijkstra's Algorithm

Problem 3. Consider the weighted graph $G(V, E, w)$ pictured below. Work through Dijkstra's algorithm on the following graph, using the source vertex S.

- Clearly include the contents of the priority queue *in priority order*, as well as the distance from S to each vertex at each iteration.

- If you use a table to store the distances, clearly label the keys according to the vertex names rather than numeric indices (i.e., `dist['B']` is more descriptive than `dist['1']`).

- You do **not** need to draw the graph at each iteration, though you are welcome to do so. [This may be helpful scratch work, which you do not need to include.]
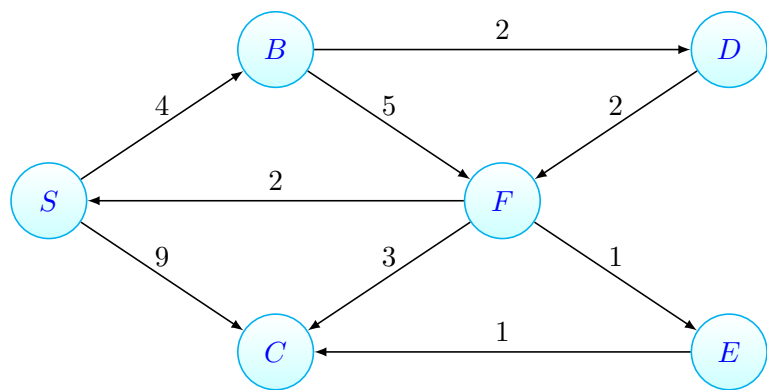
Answer. The following block will outline the priority queue step-by-step (distances order corresponds to the priority queue):

Table 1: Priority Queue Contents

Step	Queue Contents	Distance
0	S	N/A
1	B	4
2	B, C	4, 9
3	D, C	6, 9
4	D, C, F	6, 9, 9
5	F, C	8, 9
6	C, E	9, 9
7	E	9
8	All Nodes Explored	All Nodes Explored

Final Distances:
$S = 0$
$B = 4$
$D = 6$
$F = 8$
$C = 9$
$E = 9$

□