 Due by midnight today

CMPSC 102
Discrete Structures
Fall 2018

Practical 9: Graph Theory

Refer to your notes, slides and sample Python code from this week and other weeks. In particular, follow the python code that we created in class or check on line for interesting pieces of code to help you in your programming.

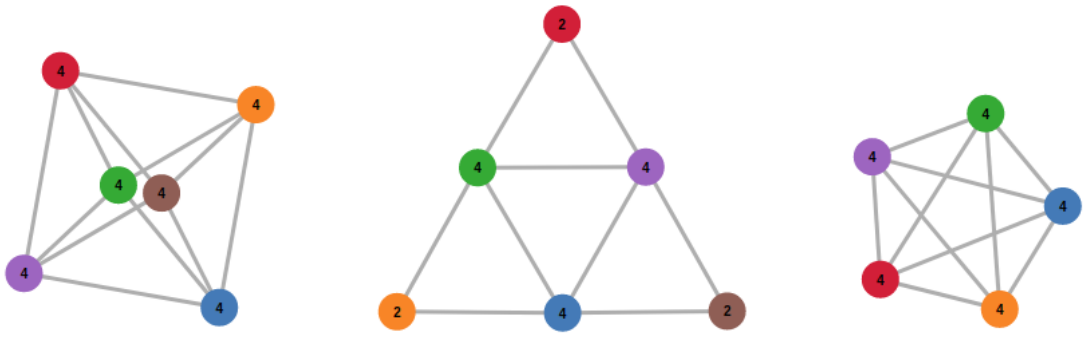

Figure 1: A closed-walk through these graphs is allowed to visit each edge of the grpah only once, and is called an Eulerian Circuit. In other words, an Eulerian circuit describes a walk where each edge can be visited only once as we traverse all edges in the graph.

GitHub Starter Link

https://classroom.github.com/a/ZK8uksGT

To use this link, please follow the steps below.

- Click on the link and accept the assignment.
- Once the importing task has completed, click on the created assignment link which will take you to your newly created GitHub repository for this lab.
- Clone this repository (bearing your name) and work on the practical locally.
- As you are working on your practical, you are to commit and push regularly. You can use the following commands to add a single file, you must be in the directory where the file is located (or add the path to the file in the command):
  - `git commit <nameOfFile> -m ‘‘Your notes about commit here’’`
  - `git push`

  Alternatively, you can use the following commands to add multiple files from your repository:

- `git add -A`
- `git commit -m ‘‘Your notes about commit here’’`
- `git push`

Summary

In this practical, you be following an interactive tutorial in which you are able to learn all about Graph Theory.

The Steps to Complete

1. Go to the *D3 Graph Theory* tutorial at https://mrpandey.github.io/d3graphTheory/. We will follow sections; 1 through 10. You are encouraged to explore other sections if you have time.

   Note: If you are interested in learning how this tutorial was created, the GitHub repository can be found at: `https://github.com/mrpandey/d3graphTheory`.

   In each section, there are sometime learning questions or activities to encourage your learning. Respond to these exercises (as you see them) in your report. Also, spend some time to draw out the graphs to play with them in light of the context of the section.

2. There are always opportunities where you can create and play with a graph to experiment with what was discussed in the section. For each section, describe the material in the lesson and show a graph that you have designed yourself to illustrate the context. Explain your thinking.

3. Go to the tutorial's sections 13, 14, and 15. Complete the exercises and respond to the learning questions in your report.

4. Answer the following: In your own words, what is an **Eulerian Circuit** and what is its relevance to writing software or creating hardware?

5. Answer the following: Also in your own words, what is an **Eulerian Trail** and what is its relevance to discrete structures? Can you think of an application where the study of this type of graph could be very important?

Deliverables

1. Your completed reflection document (`writing/report.md`) where you describe your efforts in the segments of the tutorial explain what you have learned. Please add screen shots to showcase some of your own graphs that you been studying in each segment.

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