

CMPSC 102
Discrete Structures
Fall 2019

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.

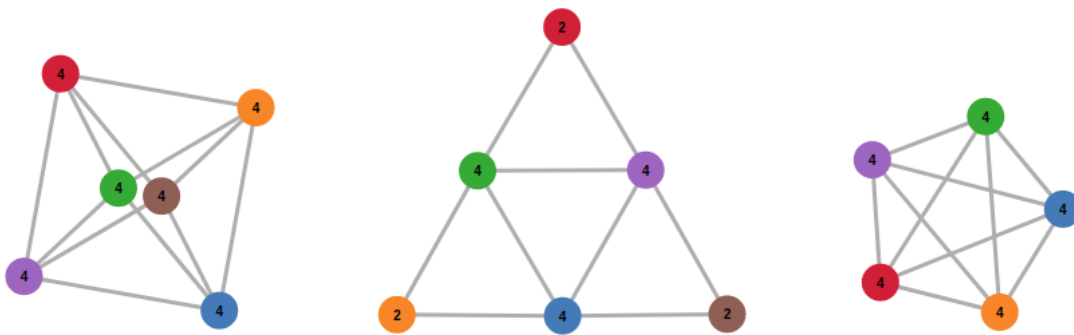


Figure 1: A closed-walk through these graphs is allowed to visit each edge of the graph only once, and is called an Eulerian Circuit. In other words, an Eulerian circuit describes a walk where each edge can be visited only once as we traverse all edges in the graph.

GitHub Starter Link

<https://classroom.github.com/a/vuqi9pfx>

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

- Go to the *D3 Graph Theory* tutorial at <https://mrpandey.github.io/d3graphTheory/>. We will follow sections; 1 through 16. If you have time, you are encouraged to explore other sections.

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 some learning questions or activities to encourage your learning. If you are up for the challenge, briefly respond to these exercises (as you see them) in your deliverable document. Please be sure to label the question number along with your response in your deliverable for this practical. Also, spend some time to draw out the graphs in your browser to play with them in light of the context of the section.

- **Questions-in-blue:** Answer the following questions in your own words. **In your markdown file, please include an example image of each of the graphs of the questions below.** The below code shows you how to include `png` graphics (called, *graph.png* which is located in the `images/` directory of the `report.md` file).

! [Logo] (images/graph.png)

1. What is a **Walk graph**? What could you use this type of graph to study?
2. What is a **Bipartite graph**? Can you think of any real word use (or a scenario) in which these graphs may be used?
3. What are **Connected graphs**? What could you use these graphs to study?
4. What is an **Eulerian Trail graph**? Can you think of an application where the study of this type of graph could be important?
5. Of all the graphs that you played with during this tutorial, which one(s) were your favorite? Why?

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.

--. .-. .- .--. / - --- .-. -.-- / / .- .-- --- -- . -.-.--