

Discrete Structures, Misc 09

Patrick O'Connor

due: 26 April 2021

This homework assignment should be submitted as a single PDF file both to D2L and to Gradescope.

General homework expectations:

- Homework should be typeset using LaTeX.
- You will not plagiarize.
- List collaborators at the start of each question using the `collab` command.
- What did you learn?
- What is a piece of advice that you took away?
- Did an audience member ask a question that you particularly liked or disliked?
- Is there a question that you wish you could have asked but didn't?
- If related to the event, what were you thinking about as you were leaving?
- Did this event inspire you to look something up after the event? If so, what was it?
- Did you meet someone new at this event who you could see as a mentor / mentee / collaborator in the future?
- What is your take-away message from this event?
- How did the contents of this event relate to our class? (Even if not explicitly discussed).

CSCI 246 Problem 09-1

Collaborators on this problem: n/a

Article in the News Find a reference (direct or indirect) of something relating to this class in the news. Was the concept used or applied correctly? Using this article, explain the concept to your imaginary 8-year-old sibling.

The article that I found through a bit of researching is on the four-color theorem and a mistake that the author made when thinking about this theorem. This version that is linked below is an updated article that she created after a reader reached out to him via email. The reader noticed a flaw in her reasoning in that stated that "I talked about some of the hypotheses of the theorem, including the fact that countries or states need to be connected in order for the theorem to apply. In other words, we aren't guaranteed to be able to color a map with only four colors if I demand that both the Upper Peninsula and "mitten" of Michigan be colored green. I also said, "It was a little harder to figure out that a country shouldn't have a hole in it, or completely surround another country or countries."

Simply put she believe that there had been a mistake in the four color theorem as when there is a hole in the country there would not be a four coloring. This is false as the reader justified with the stating the four-color theorem is not exactly about maps and globes as humans generally think about them but rather an interpretation in that the details are stripped away and we are left with only edges and vertices that represent the borders of each country. The reader also clarified that a graph that comes from a map will always be planar with no two edges connecting to vertices of the same color.

Overall, the original post that the author had written had many flaws in it that did not align with what we have been learning throughout this class. But I did like that the author retracted his previous post and edited it to fit the mathematical standards for creating maps/graphs that are used when establishing four colorability. This revision does align with everything we are learning and is solid in following the correct guidelines.

After reading this, I realize that although something is coming from a trusted journal such as the Scientific American there may be mistakes in the logic the author is using and it is best to use multiple sources when determining the reliability of a paper.

Scientific American [2] *Princeton* [1]

Figure 1 Four color of map of Europe from Princeton University

EUROPE



Figure 1: Four color map of Europe from Princeton University

References

- [1] Princeton lecture. http://web.math.princeton.edu/math_alive/5/Notes2.pdf. Accessed: 2021-04-26.
- [2] Scientific american: Wrong in public: the 4-color theorem edition. <https://blogs.scientificamerican.com/roots-of-unity/wrong-in-public-4-color-theorem/>. Accessed: 2021-04-26.