Math 154 Homework #2

Spring 2023

Due date: **11:59pm** Pacific Time on **Wed, Apr 19** (via Gradescope)

On the first page of your work, please write a list of everyone with whom you collaborated on this assignment, as well as any outside sources you consulted, apart from the textbook, your notes, and the course staff. If you did not collaborate with anyone, please explicitly write, "No collaborators."

Problem 1.

(a) For which values of $n \geq 2$ does the complete graph K_n have:

- an Eulerian tour?
- an Eulerian trail starting/ending at distinct vertices?
- a Hamiltonian cycle?

(b) For which values of $r \geq 1$ and $s \geq 1$ does the complete bipartite graph $K_{r,s}$ have:

- an Eulerian tour?
- an Eulerian trail starting/ending at distinct vertices?
- a Hamiltonian cycle?

Problem 2. Answer **Question 2.9** at the end of chapter 2 of the textbook.

Problem 3. Answer **Question 2.16** at the end of chapter 2 of the textbook.

Problem 4. Read this document about solving graph theory problems (by Matt DeVos at Simon Fraser University): `https://www.sfu.ca/~mdevos/notes/graph/advice.pdf`

Describe a way that you used/tried one of these techniques on a problem from this week's or last week's homework. Be specific! *Optional questions:* is there a technique from this list that you haven't used yet, but would like to try in the future? Are there any techniques on this list you didn't understand?

(Write at least 100 words.)

Note/disclaimer: this list isn't perfect, and some of the writing is maybe a little abstract or pretentious, but it has a lot of great advice, and if you really think about it and take it to heart (and maybe come back to it a few times this quarter as you're doing your homework), it will help you a lot in this class!