MA111: Contemporary mathematics

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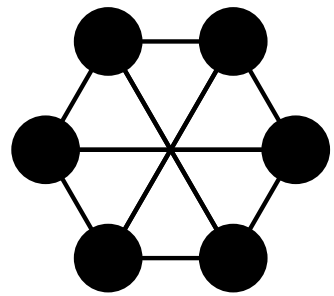
Entrance Slip (due 5 min past the hour):

- What is the minimum number of repeated edges in a tracing of this figure?



Today we examine optimal exhaustive routes and Eulerization.

Context: glow puzzle strategy

- I expect you to have mastered glow puzzle now
- Now we move beyond the frivolous game to this year's Nobel prize
- Not all glow puzzles are solvable; sometimes you have to repeat edges
- Today we want to find the best "near-solution"
- Which edges have to be repeated?

Activity: Repair the glow

- The worksheet has several impossible glow puzzles
- They become possible if you can repeat edges
- For each puzzle, find a tracing that uses the minimum number of repeated edges
- Do you need to repeat any edge more than once?
- How do you know which edges to repeat?

Fast: 5.7 Eulerization and semi-Eulerization

- An **Eulerization** of a graph is a list of edges to be repeated to get an Euler cycle
- A **semi-Eulerization** of a graph is a list of edges to be repeated to get an Euler path
- An **optimal Eulerization** is an Eulerization with the fewest (repeated) edges
- You never need to repeat an edge more than once
- Step 0: List the odd vertices
- Step 1: Pair them up
- Step 2: Find the minimal length path between pairs
- Step 3: Repeat 1 and 2 until you find the minimum total minimal length

Assignment and exit slip

- Read 5.1 - 5.7
- Be ready for practice exam tomorrow
- Be working on your glow puzzle level; due two weeks from when the assignment is posted to blackboard
- **Exit slip:** Find an Eulerization of this graph: