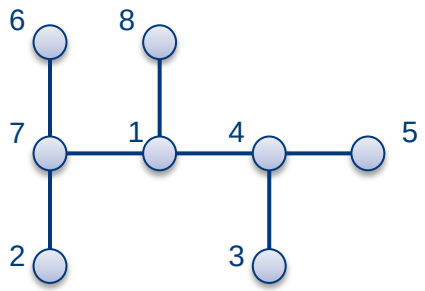
Graphs and Algorithms

장도선 교수
임소윤 조교

Lab Exercises
Week 13



This Week‘s Lecture Topics

- 5. Tour Planning (Cont'd.)
  - 5.2. Traveling Salesman Problem (Cont'd.)
  - 5.3. Chinese Postman Problem 중국인 우편배달부 문제

Part 2:
Python Programming Exercises

Remember: Always check the NetworkX reference manual
if there already exists a function that does what you want.
Or at least some part of it.

Exercise 13-2-1: TSP Heuristics

- Create a complete graph with 12 vertices.
- Assign random edge weights between 0 and 100.
- Read about TSP solving with NetworkX:
  - https://networkx.org/documentation/stable/reference/algorithms/generated/networkx.algorithms.approximation.traveling_salesman.traveling_salesman_problem.html
- Use traveling_salesman_problem() to find a good tour.
- Draw the graph and mark the edges of this tour.

Exercise 13-2-2: Augmentation

- Load and draw the undirected graph contained in file "**clausthal.layout**".
  - Make sure that the node numbers are shown in the drawing!
- Read about the functions eulerize() of NetworkX.
  - https://networkx.org/documentation/stable/reference/algorithms/generated/networkx.algorithms.euler.eulerize.html
- Check if the given graph is Eulerian. (it should not!)
- Augment this graph to become Eulerian, by using eulerize().
- Visualize the graph. Note that this is now a multigraph.

Exercise 13-2-3: Clausthal Euler Tour

- Use your code from Exercise 10-2-3.
- Find an Euler Tour.
- Display the tour in the graph using arrows and edge numbers.