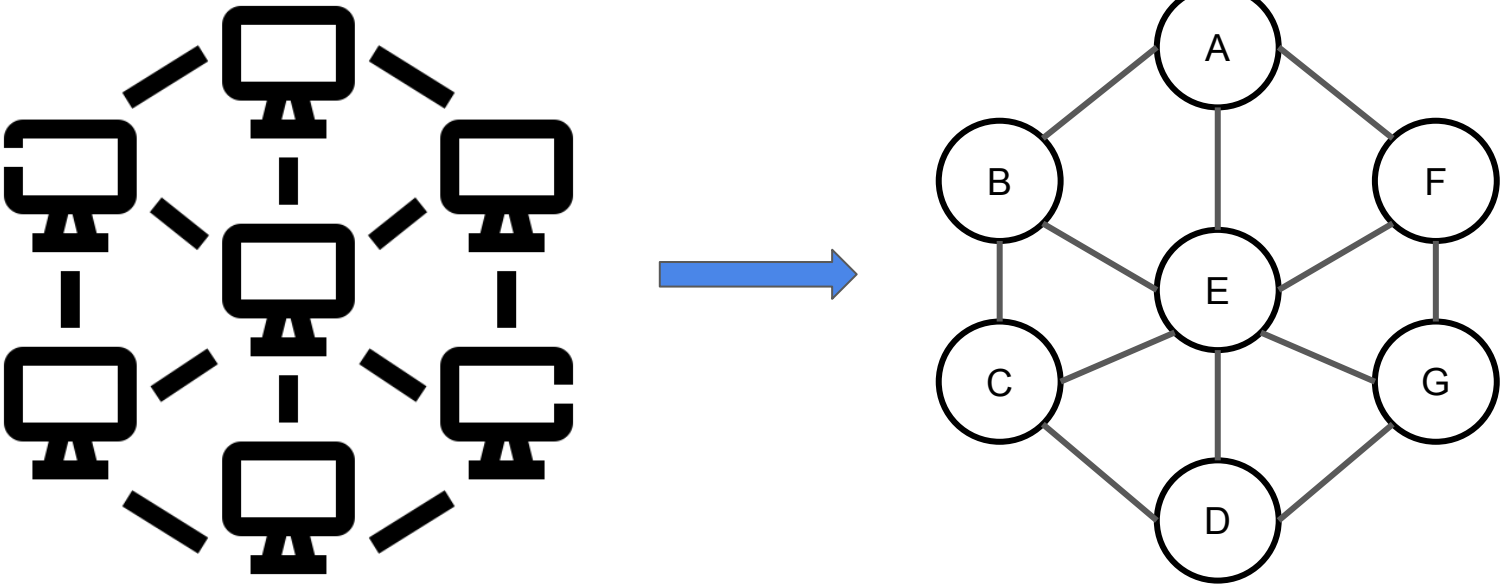
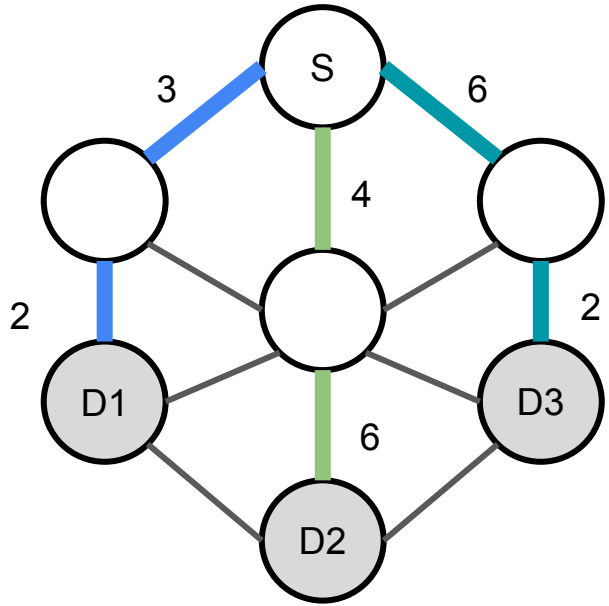
DS Final Project

A Brief Introduction & Important Notes

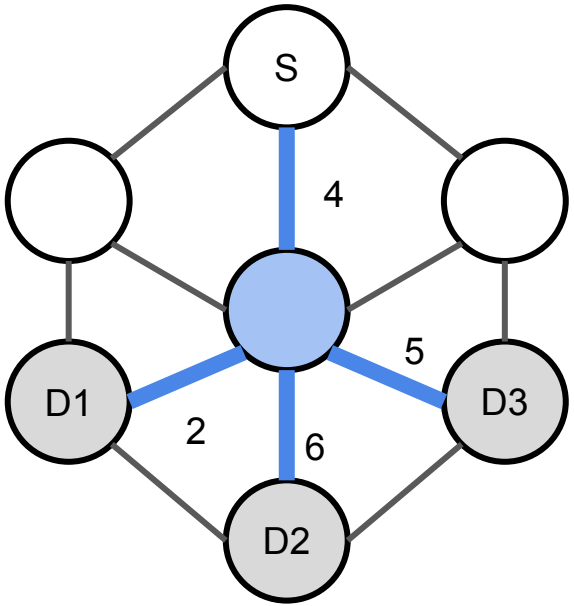
Network & Multicasting



Network & Multicasting



Without Multicasting
total cost = 23



With Multicasting
total cost = 17

Problem 1

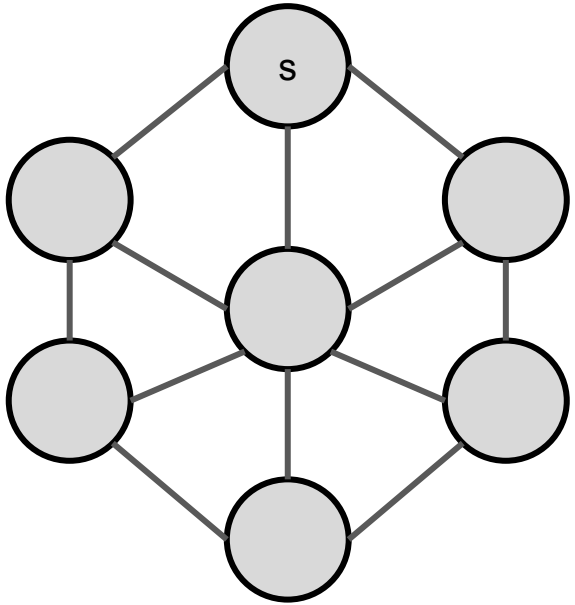
Write a C++ class *Problem1* to support

1. insert(): find multicast tree
2. stop(): remove multicast tree from G
3. rearrange(): remove all remaining and insert them into G

We have following constraints:

1. Every node is multicast destination
2. Best-effort delivery

Exists Correct Answer for each test case!



G = (V, E)

Problem 2

Write a C++ class *Problem2* to support

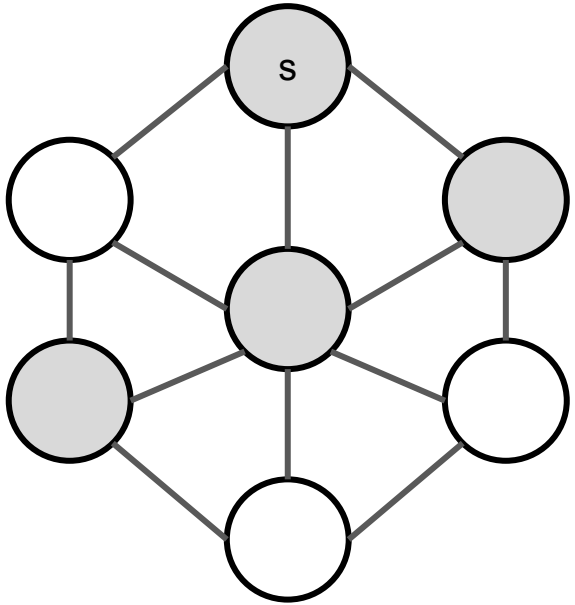
1. insert(): find multicast tree
2. stop(): remove multicast tree from G
3. rearrange(): remove all remaining and insert them into G

We have following constraints:

1. **NOT** every node is multicast destination
2. **MUST** connect all destinations to source

Your goal is to use least cost & satisfy most insert()!

No Correct Answer for each test case!



G = (V, E)

Test Case Contribution

1. You should contribute 2 test cases, one for each problem
2. The more difficult your test cases are, the higher scores you get

```
5 7
1 2 10 5
1 3 20 8
2 3 15 6
2 4 25 10
3 4 30 12
3 5 15 6
4 5 20 8

insert 1 2 {1, 2, 3, 4, 5} 10
insert 2 3 {1, 2, 3, 4, 5} 5
insert 3 4 {1, 2, 3, 4, 5} 15
stop 2
insert 4 1 {1, 2, 3, 4, 5} 5
rearrange
```

Grading Policy

30% - Problem 1 Correctness

40% - Problem 2 Performance (Cost, Penalty, Correctness)

15% - Test Case Contribution (Test Case Difficulty)

10% - Report

NO PLAGARISM!

NO LATE SUBMISSION!

Important Notes!

1. The problems are quite challenging for average student. Attempting to complete the project within a week is considered impractical
2. Due date is 2024/1/11, no late submission, start working on it as soon as possible!
3. No demo after submission, but we will randomly choose some students to explain their approach
4. We will provide some tools & sample test cases in the next update