Test 2 Review
CSCI 432

Test 2 Logistics

1. During class on Thursday 4/3.
2. You can bring your book and any notes you would like, but no electronic devices.
3. You may assume anything proven in class or on homework.
4. Four questions (15 points):
    1) Flow network (5 points).
    2) Linear program (9 points).
    3) Other (1 point).

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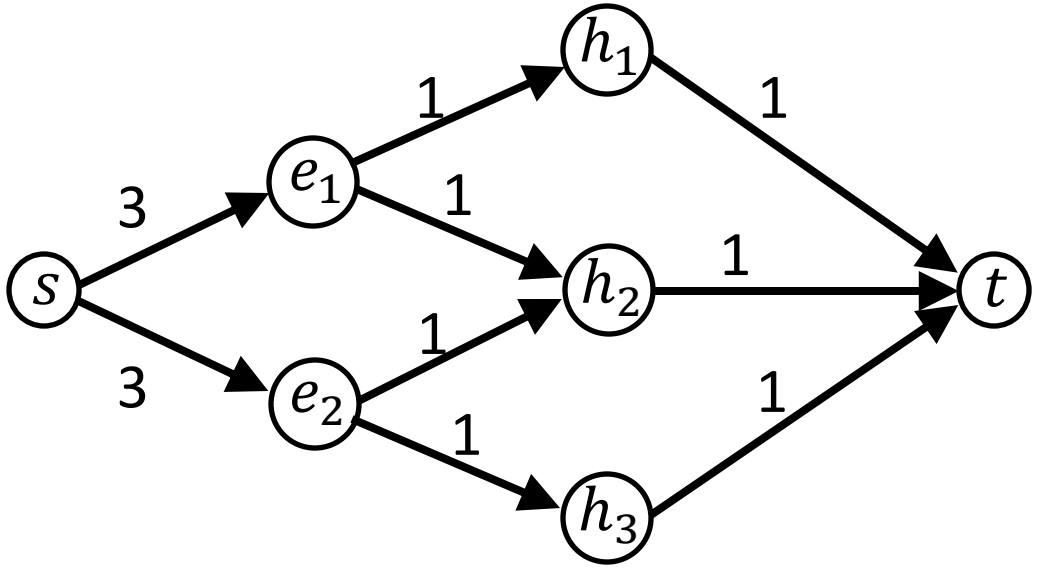
Work Scheduling

Problem: We need to make holiday schedules for our employees. Each employee has a set of holidays that they are able to work. Each employee should work at most 3 holidays. We want to maximize the number of holidays covered.

Algorithm:

1. Build flow network:
    a) Make a node for each employee, a node for each holiday, a source, and a sink.
    b) Connect the source to each employee node with a capacity of 3.
    c) Connect each holiday node to the sink with a capacity of 1.
    d) If an employee is able to work a holiday, connect them with a capacity of 1.



2. Find Max Flow.
3. If employee has outgoing edge carrying flow, assign them to work that holiday.

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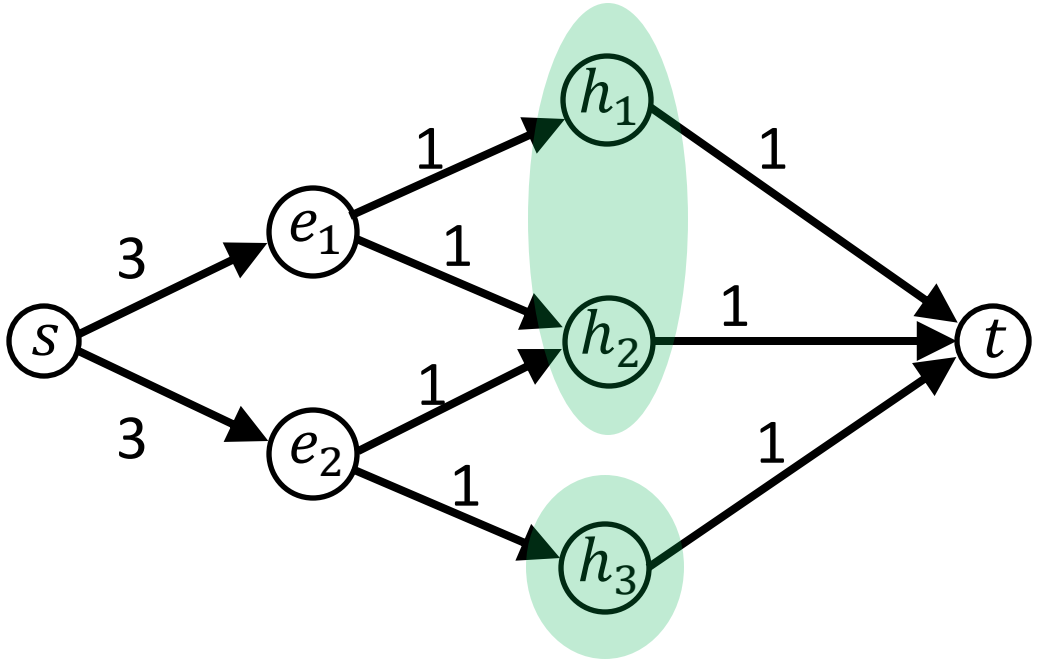
Holiday Period	Holiday	Available Employees
Thanksgiving	h_1	e_1
	h_2	e_1, e_2
Halloween	h_3	e_2



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Make a node for each holiday period. Make edge between new node and each holiday in that period. Make edge between employee and period with holiday they are available on.

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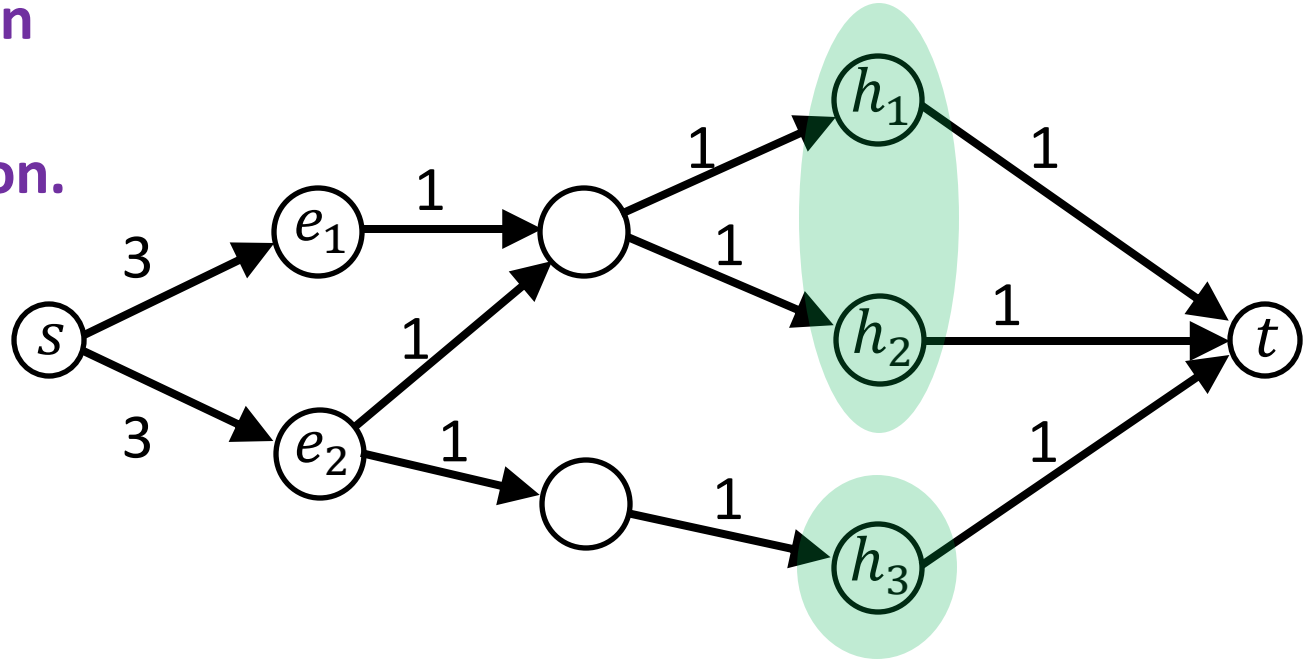

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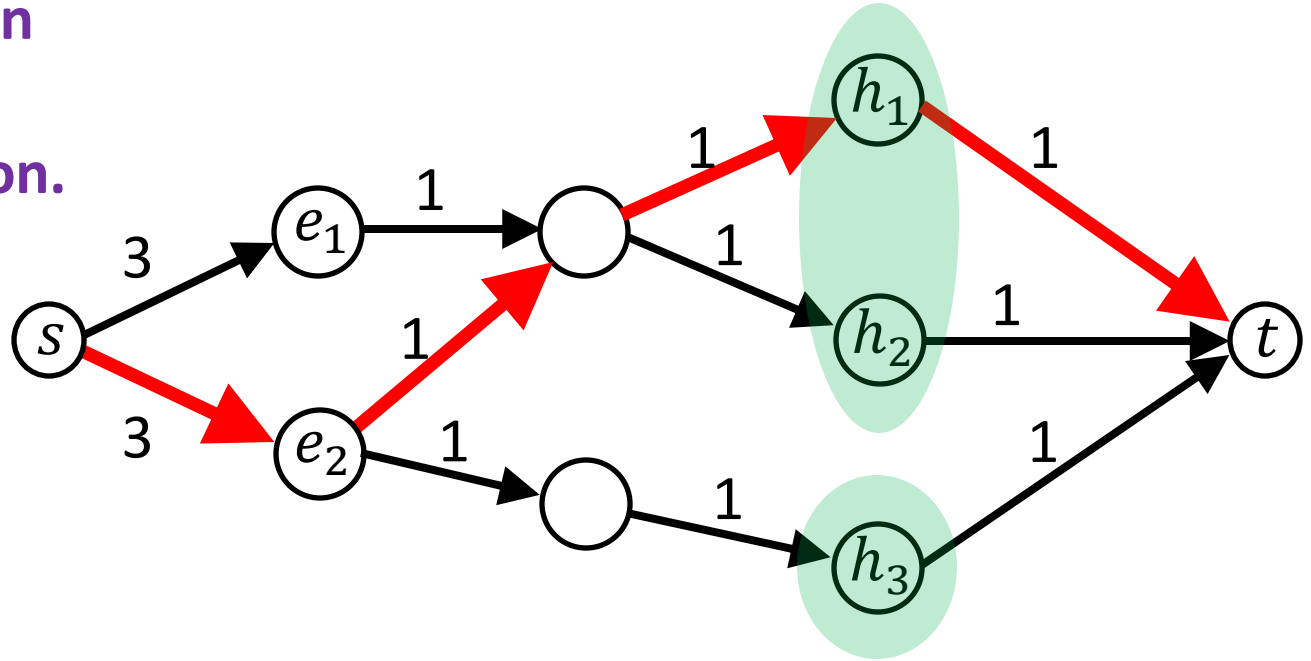

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Make a node for each holiday period and each employee that is available on a holiday in that period…

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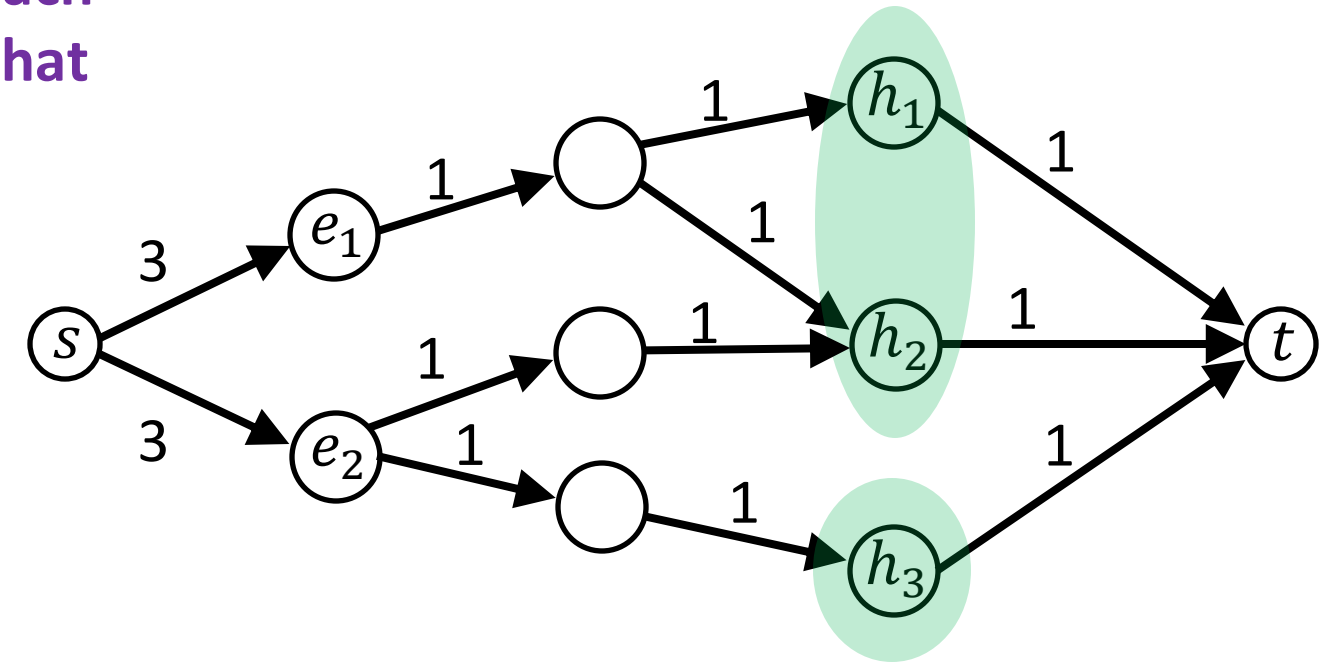

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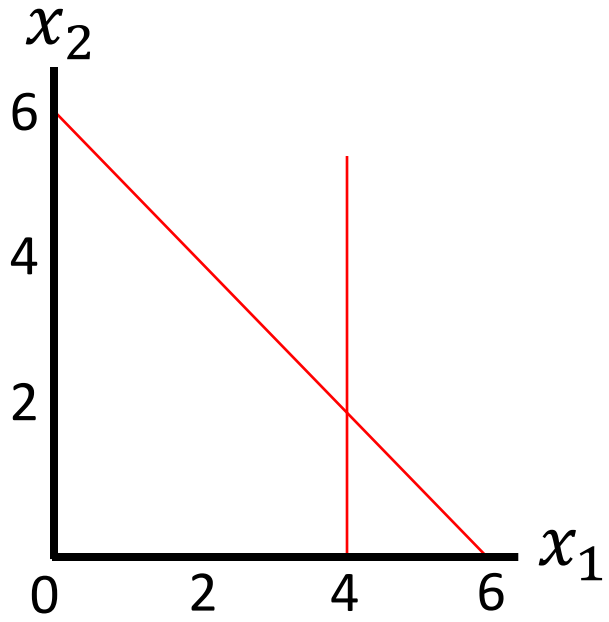

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