Property Demonstration on the Algorithms Addressing Vertex Cover Problem with Various Examples

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Recent Research Topic: Generative Model

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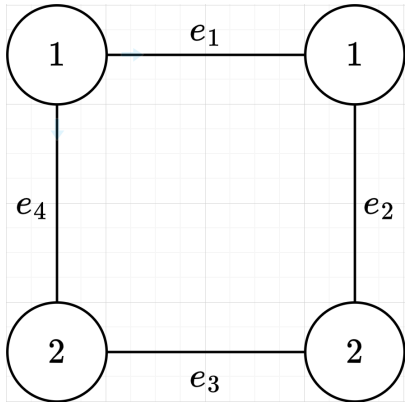
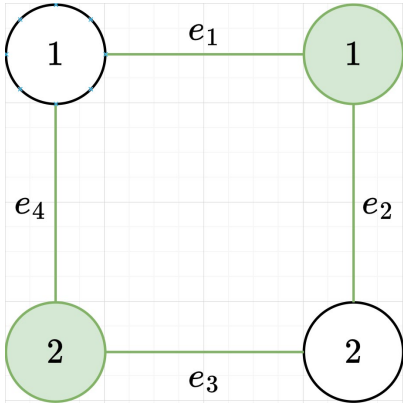
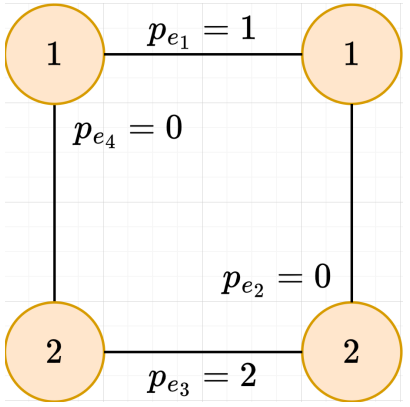
Task 8-1

Consider all 4 points with circular 4 edges in a graph.

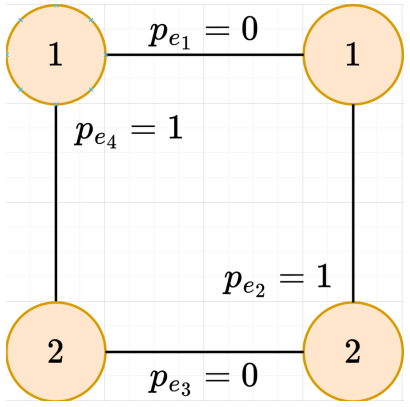




Optimal
$w^* = 3$



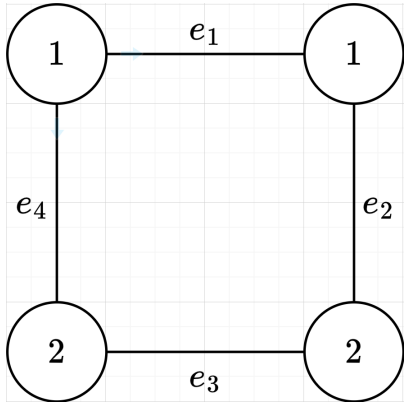
$w = 4 = 2w^*$

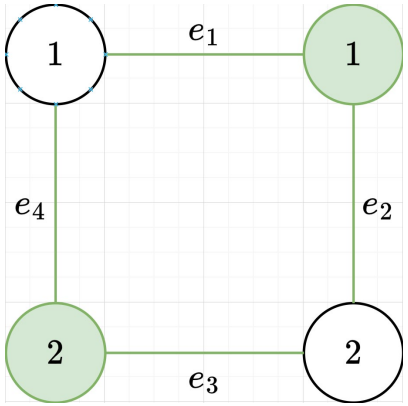


$w = 4 = 2w^*$

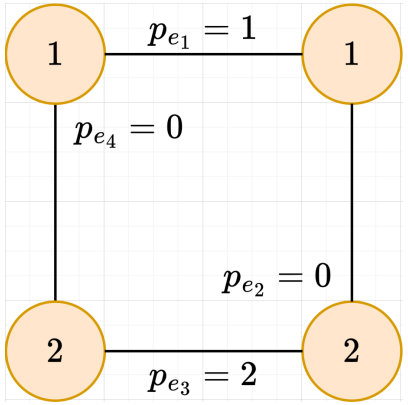
Task 8-2

Consider all 4 points with circular 4 edges in a graph.

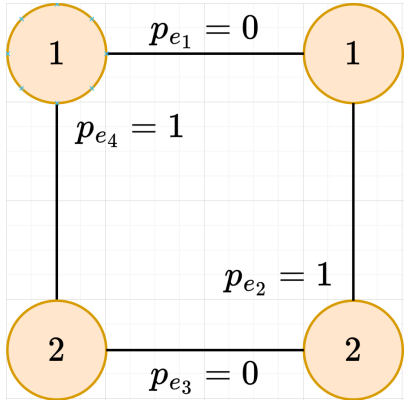




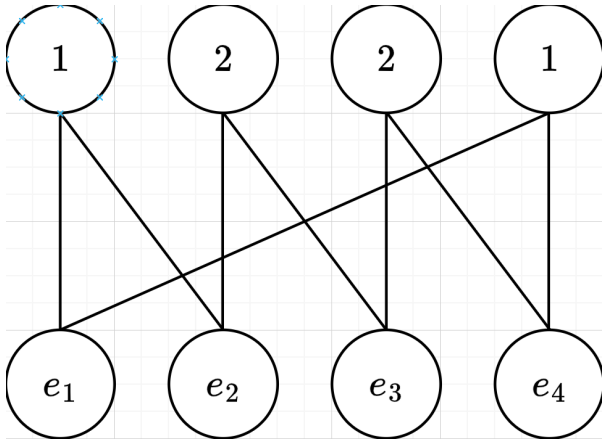
Optimal
$w^* = 3$



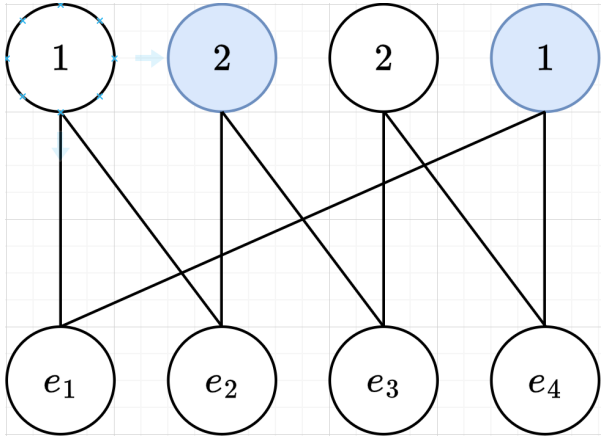
$w = 6 = 2w^*$



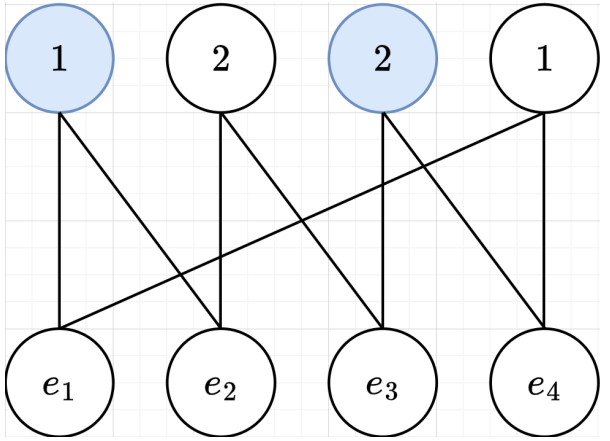
$w = 6 = 2w^*$



Set Cover
Problem

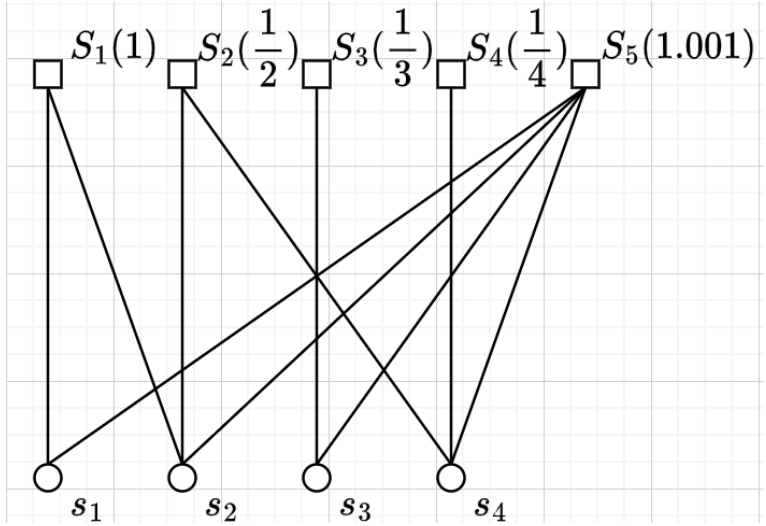


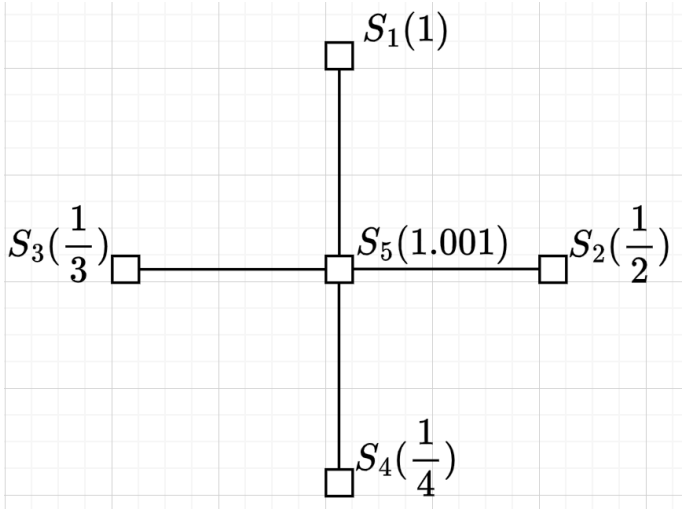
Greedy,
$w = 3 = w^* < 6$

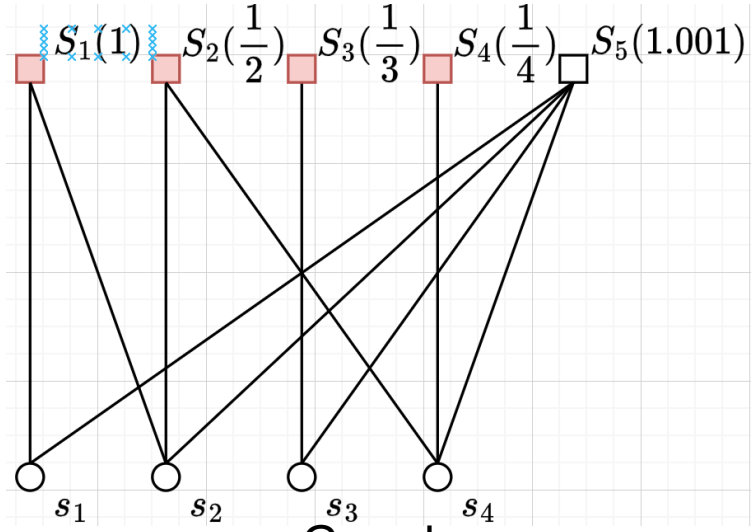


Greedy,
$w = 3 = w^* < 6$

Task 8-3

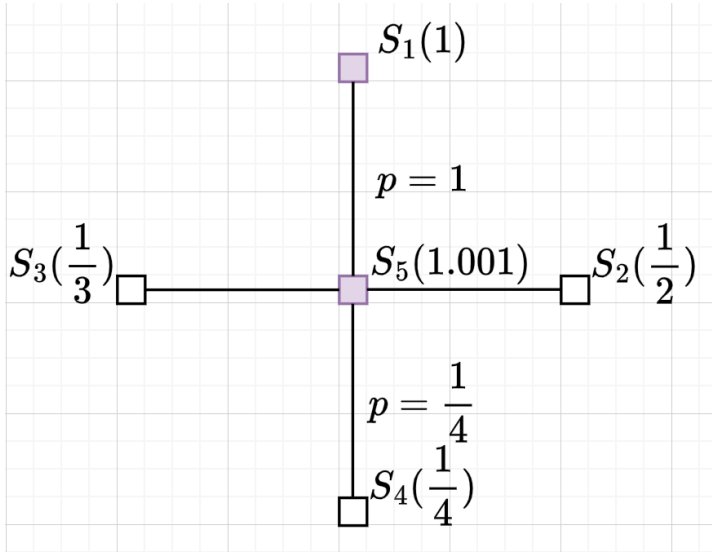






Greedy,

$$w = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} = 2.0833$$



Worst pricing,

$$w = 1 + 1.001 = 2.001 < 2.0833$$