Wrap-up
CSCI 338

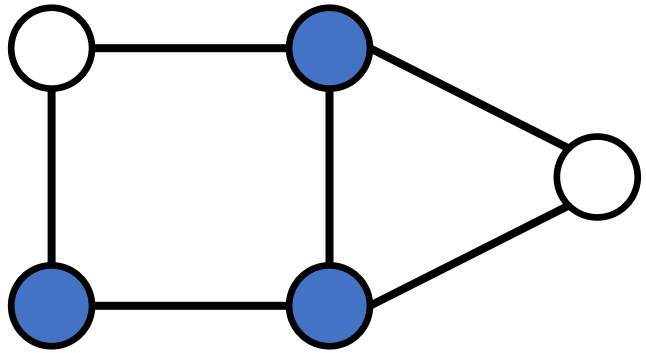
Semester Wrap-up

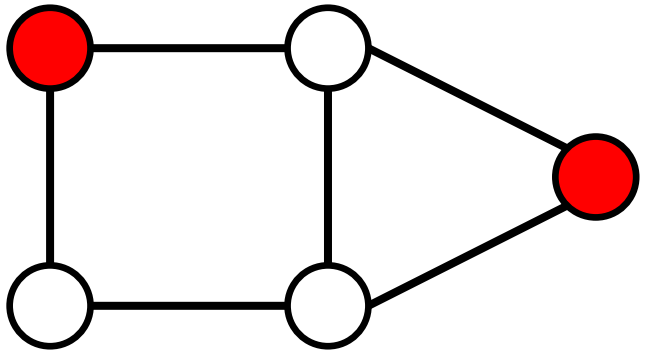
1. Check all of your grades and let me know about issues.
2. No office hours on Wednesday (5/1).
3. Test 3 on Wednesday (5/1).
4. ‘Current Final Course Grade’ in D2L will be the final letter grade you get if you do not show up to the final.
5. Final Exam review on Friday (5/3).

Test 3 Logistics

1. During class on Wednesday (5/1).
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 homeworks unless specifically told you can't.
4. Three questions:
    1) Show a problem is in P.
    2) Show a problem is in NP-Complete (translation provided).
    3) Show a problem is in NP-Complete (translation not provided).

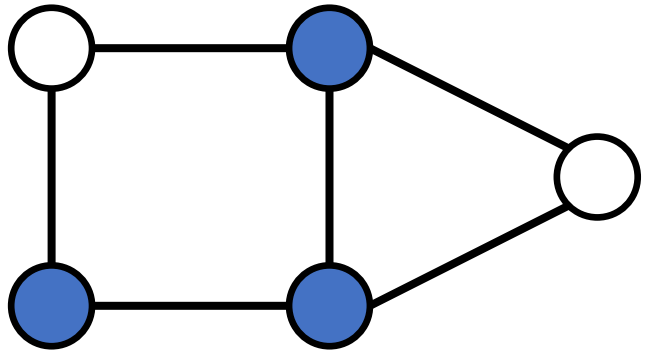
Problem 2

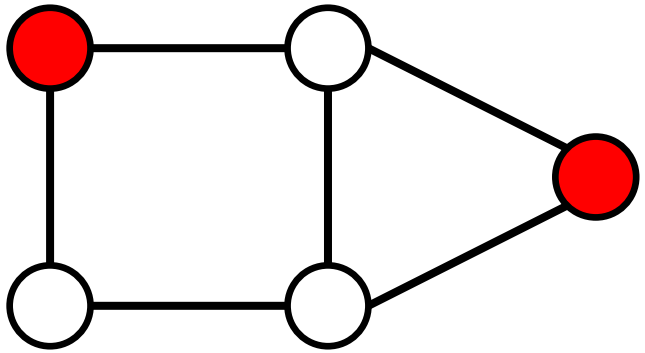




k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Problem 2

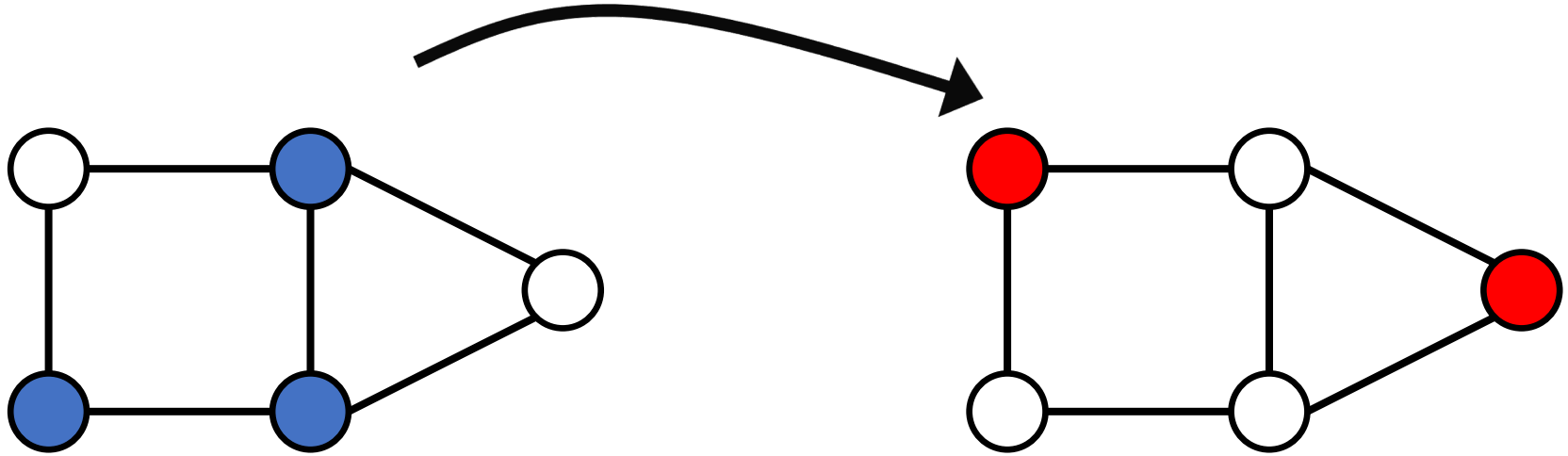




k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Suppose there is a VC of size k…

Problem 2

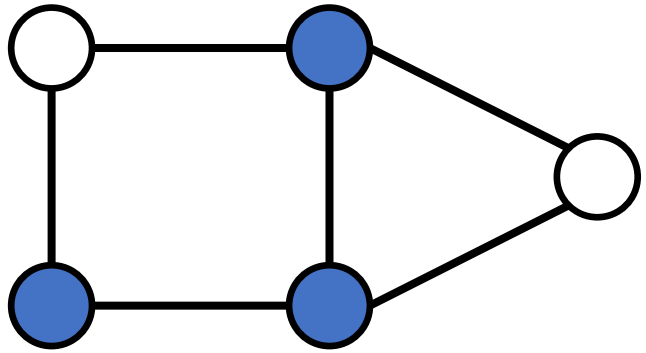


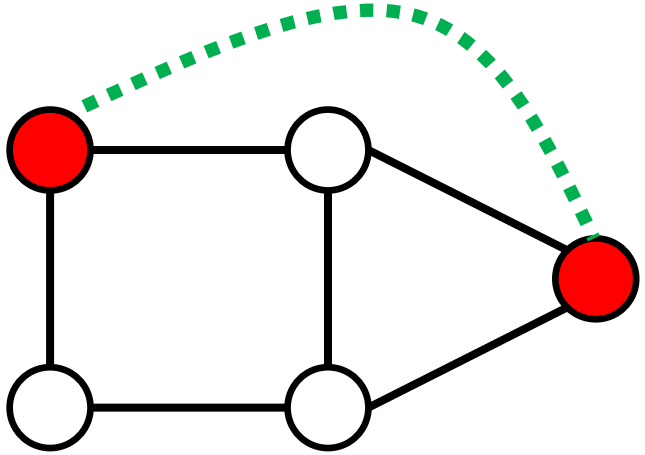
k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Suppose there is a VC of size k…

Identify the set we want to show is an IS

Problem 2

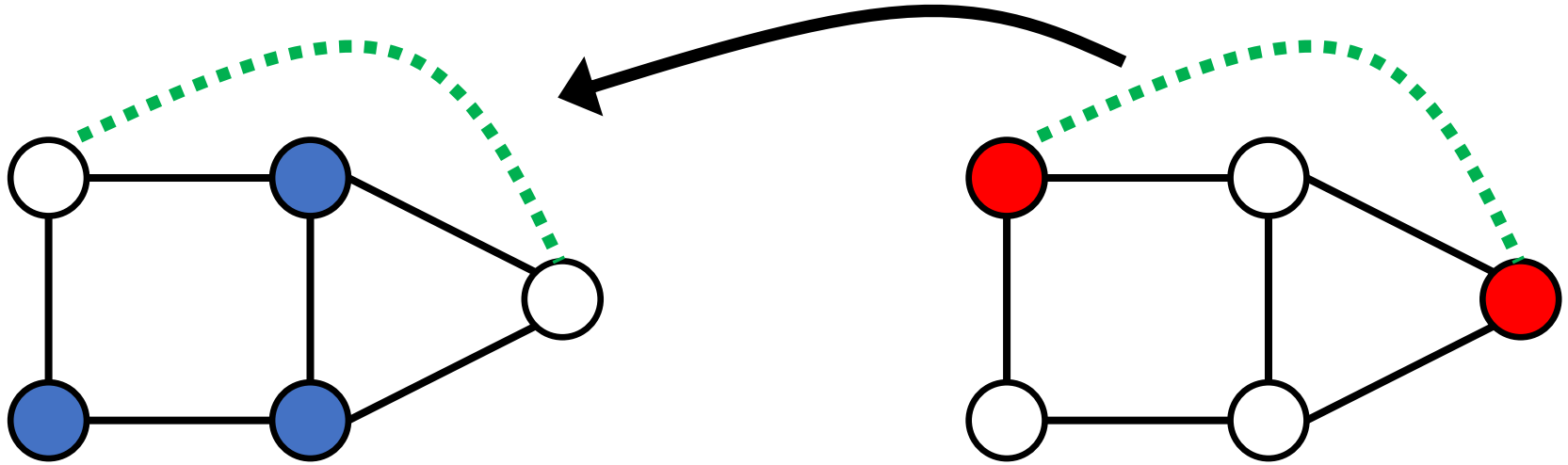




k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Suppose that set is not an IS…

Problem 2

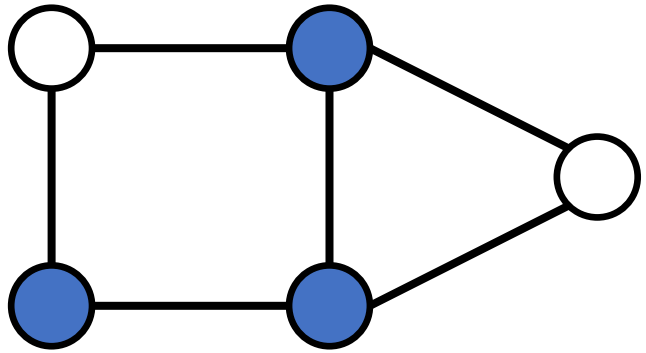


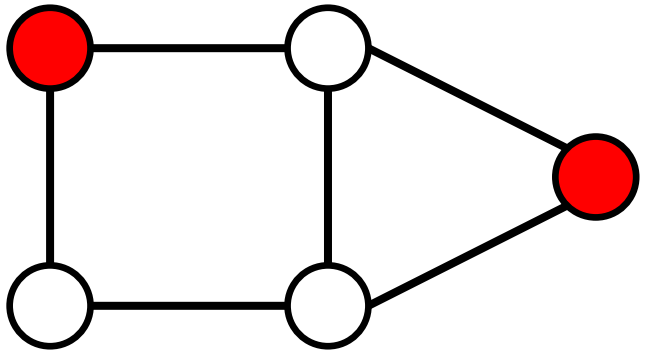
k - VC $\iff$ $(n-k)$ - IS

Contradict fact we had a VC over here.

Suppose that set is not an IS…

Problem 2

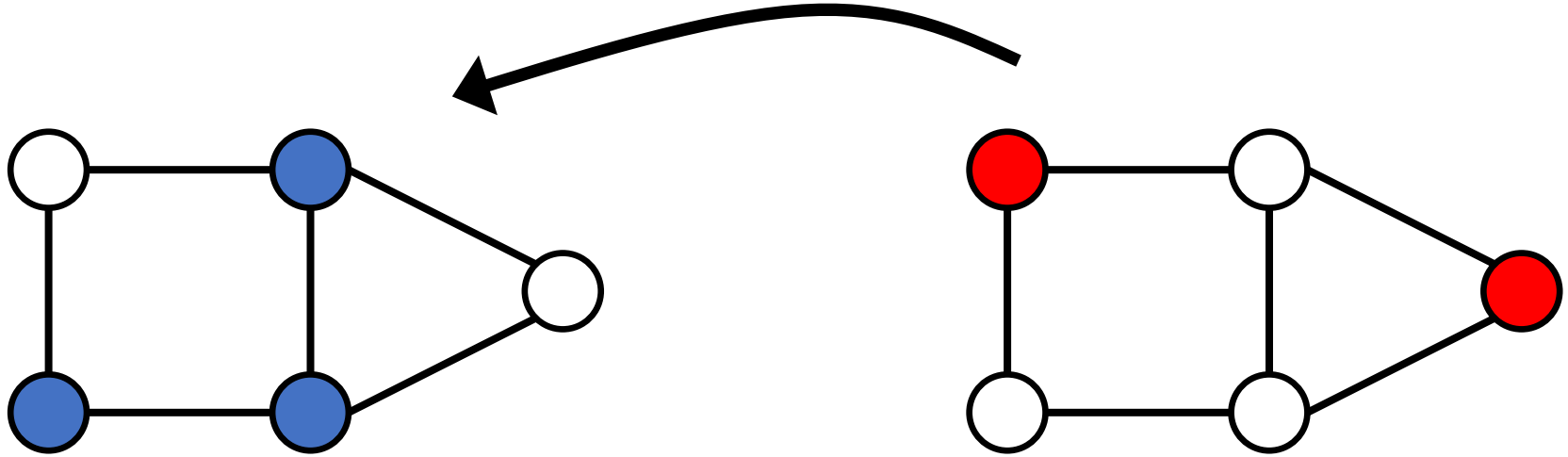




k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Suppose there is an IS of size $(n-k)$…

Problem 2

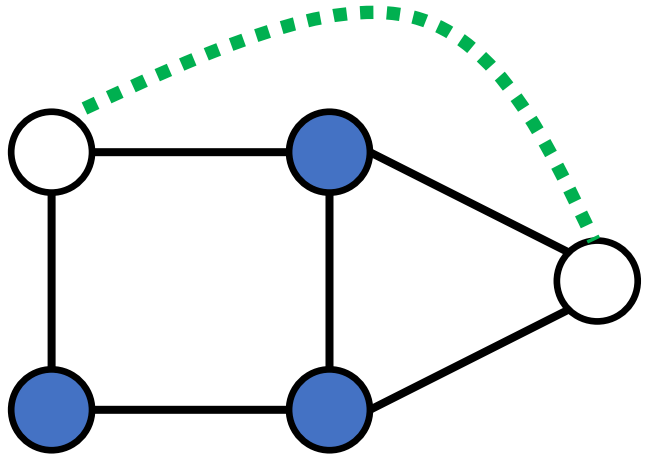


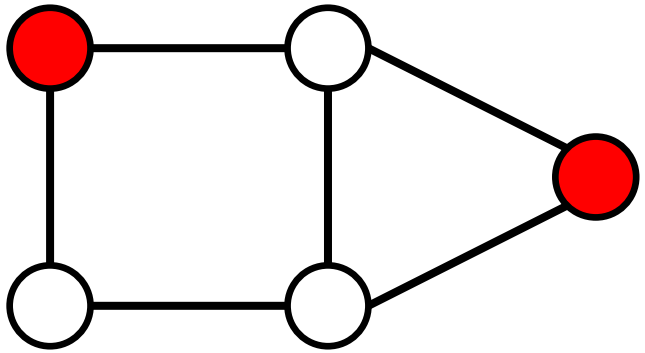
k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Identify the set we want to show is a VC.

Suppose there is an IS of size $(n-k)$…

Problem 2

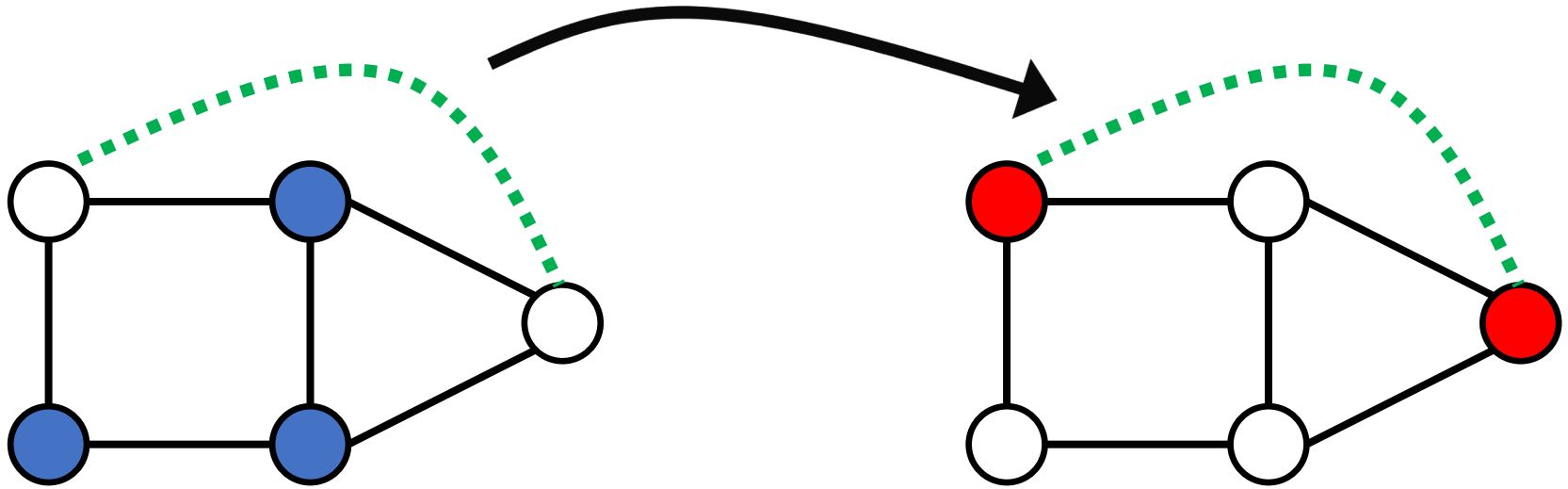




k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Suppose the set is not a VC…

Problem 2

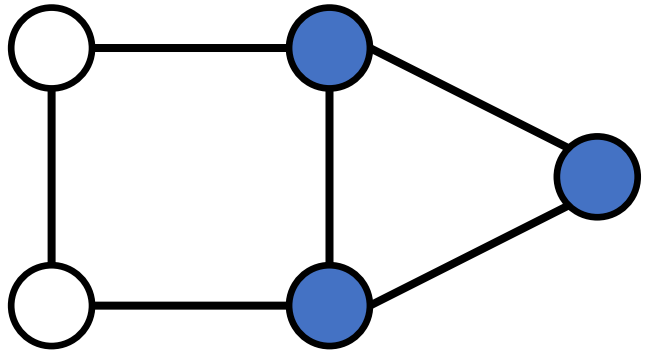


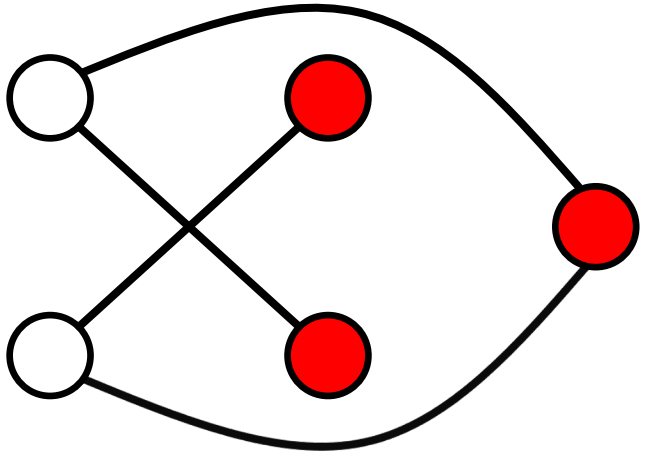
k - VC $\Longleftrightarrow$ $(n-k)$ - IS

Suppose the set is not a VC…

Contradict the fact we had an IS over here.

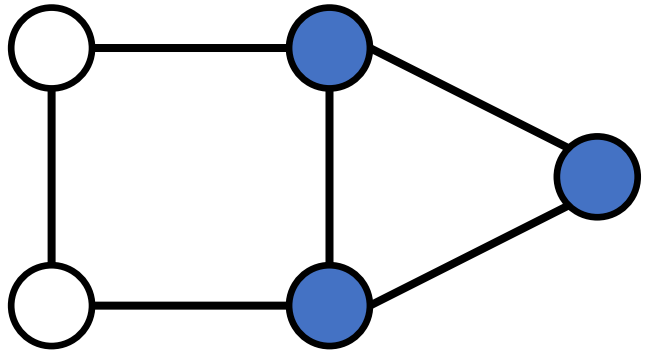
Problem 3

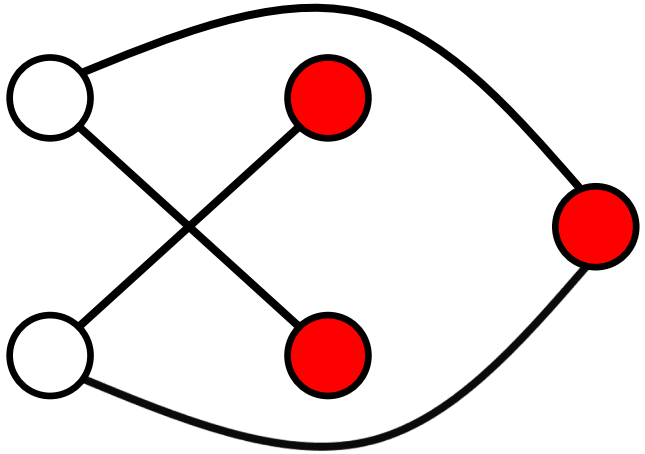




k - Clique $\Longleftrightarrow$ k - IS

Problem 3

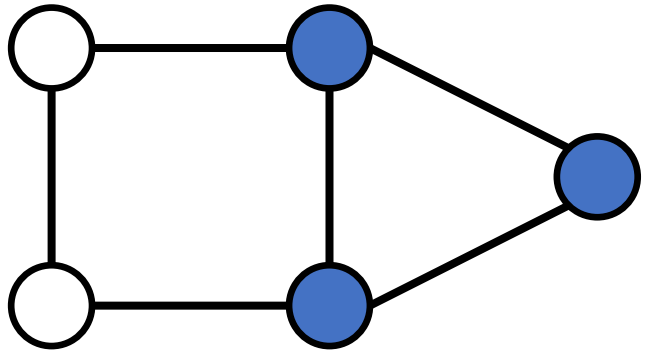


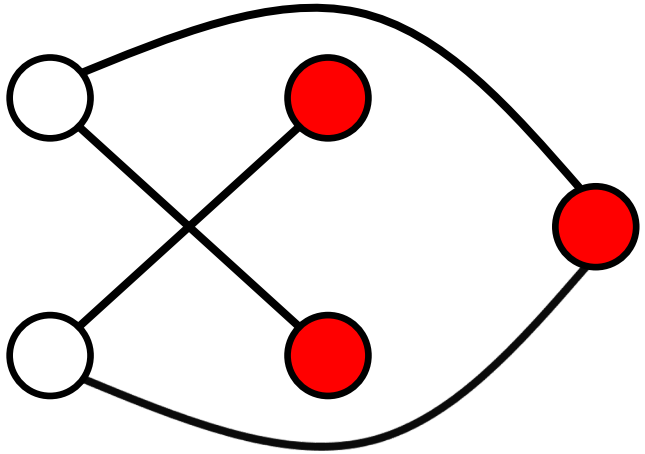


k - Clique $\Longleftrightarrow$ k - IS

Suppose there is a clique of size k…

Problem 3



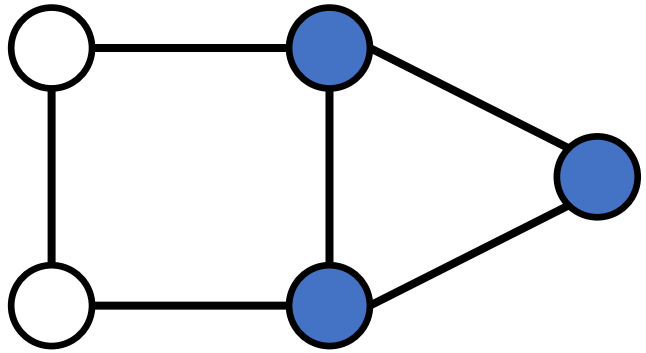


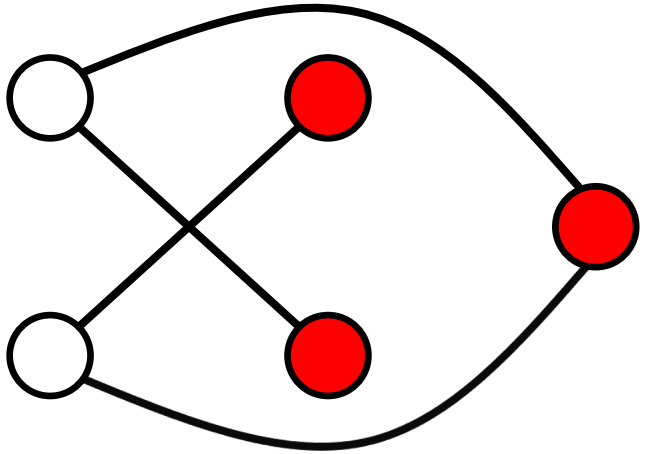
k - Clique $\Longleftrightarrow$ k - IS

Suppose there is a clique of size k…

Then none of those nodes share an edge here.

Problem 3

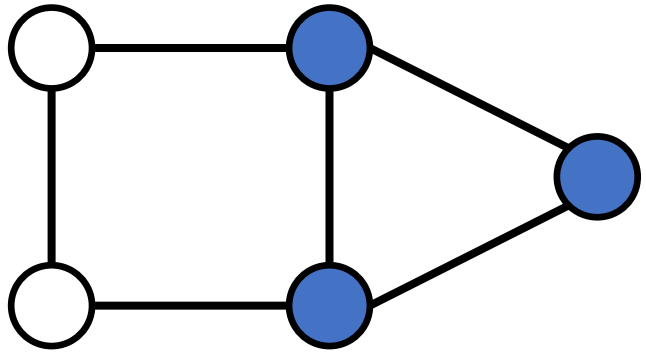


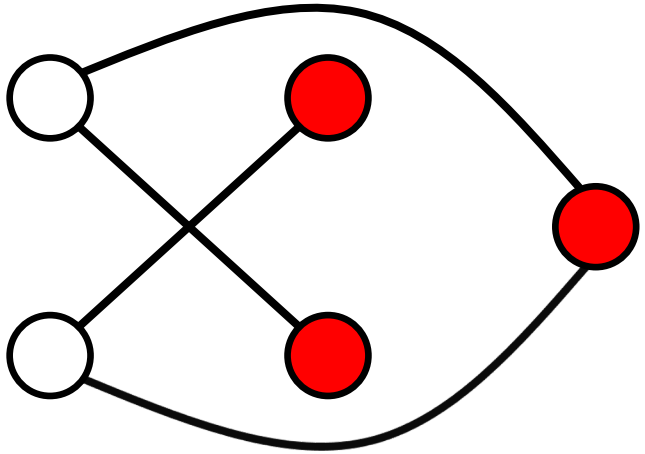


k - Clique $\Longleftrightarrow$ k - IS

Suppose there is an IS of size k…

Problem 3





k - Clique $\Longleftrightarrow$ k - IS

Then all of those nodes share an edge here.

Suppose there is an IS of size k…

2nd Problem 3 (traditionally called problem 4)

ϕ

Can be set to true

$\Longleftrightarrow$

$\phi \wedge (z \vee \bar{z})$

Can be set to true with two different assignments

2nd Problem 3 (traditionally called problem 4)

ϕ $\iff$ $\phi \wedge (z \vee \bar{z})$

Can be set to true $\iff$ Can be set to true with two different assignments

Suppose ϕ can be set to true…

2nd Problem 3 (traditionally called problem 4)

ϕ

$\phi \wedge (z \vee \bar{z})$

Can be set to true $\iff$ Can be set to true with two different assignments

Suppose ϕ can be set to true…

Consider:

1. Same ϕ assignment, $z = T$.
2. Same ϕ assignment, $z = F$.

2nd Problem 3 (traditionally called problem 4)

ϕ

Can be set to true

$\Longleftrightarrow$

$\phi \wedge (z \vee \bar{z})$

Can be set to true with two different assignments

Suppose $\phi \wedge (z \vee \bar{z})$ can be set to true…

2nd Problem 3 (traditionally called problem 4)

ϕ

Can be set to true

$\Longleftrightarrow$

$\phi \wedge (z \vee \bar{z})$

Can be set to true with two different assignments

How could ϕ not be able to be set to true?

Suppose $\phi \wedge (z \vee \bar{z})$ can be set to true…