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Panda Cubs, Distributed Networks and Others

How They Survive in Distributed Networks and Why?

September 2, 2021

Contents

Outline for Elements

1. Elements
   - Blocks
   - List Environments
   - Illustrations

2. Overlays

Definition

The definition below is from Angluin 1980.

Definition

Here is a definition block.

Theorem

The following is proved in Yamashita and Kameda 1996, pp. 74–75.

Theorem

Here is a theorem block.

Alert

If you want to alert something, just do it.

Notice

I can eat glass. It does not hurt me.

You Can Also Define by Yourself

Conjecture

An (x, bx)-biregular graph $G = (U \cup V, E)$ is the union of b edge-disjoint bipartite x-regular subgraphs.

Unordered/Order List

What a panda cub can bite:

- Bamboos
- Cookies
- Glass, of course

What you have to do next:

1. Eat
2. Pray
3. Love

List With Item Labels

Morgan An American financier and banker

Bach A German composer and musician

Naipaul A Trinidad and Tobago-born British writer

Figures

(Photo by Pascal Müller on Unsplash)

Tables

Degree Tree D_i (Key)	D_1	D_2	$\dots$	D_κ
Degree Tree Class V_{D_i} (Value)	V_{D_1}	V_{D_2}	$\dots$	V_{D_κ}

Table 1

ID	Age	Salary	Panda
1	11	11111	11
2	7	78	0
3	121	0	302
4	43	18744	1
5	88	-342	6344

Table 2

Outline for Overlays

\pause

The command \pause makes the text following it to be shown only from the next slide on, which is a command using \onslide internally.
An example:

\pause

The command \pause makes the text following it to be shown only from the next slide on, which is a command using \onslide internally.
An example:

- One

\pause

The command \pause makes the text following it to be shown only from the next slide on, which is a command using \onslide internally.

An example:

- One
- Two

The command \pause makes the text following it to be shown only from the next slide on, which is a command using \onslide internally.
An example:

- One
- Two
- Three

\uncover, \visible & \only

\uncover The text occupies space and is still typeset, but it is not shown or only shown as if transparent

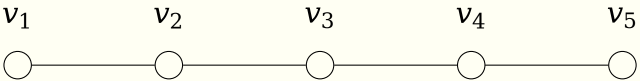
\visible It is almost the same as \uncover, except that if the text is not shown, it is never shown transparently, but rather it is not shown at all

\only The text is inserted only into the specified slides and for other slides, it is thrown away and occupies no space

Examples of \uncover, \visible & \only

A labelling is a set of local labelling functions.

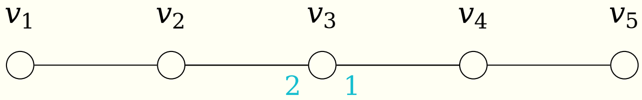
- The vertex-labelled graph G



Examples of \uncover, \visible & \only

A labelling is a set of local labelling functions.

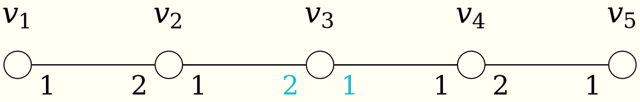
- The vertex-labelled graph G
- The local labelling function f_{v_3}, for $f_{v_3}(v_2) = 2$ and $f_{v_3}(v_4) = 1$



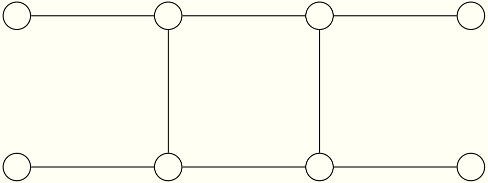
Examples of \uncover, \visible & \only

A labelling is a set of local labelling functions.

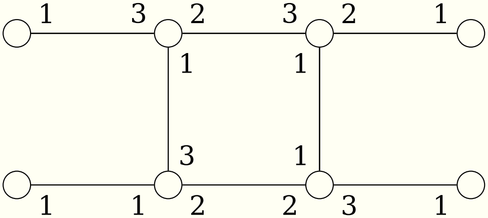
- The vertex-labelled graph G
- The local labelling function f_{v_3}, for $f_{v_3}(v_2) = 2$ and $f_{v_3}(v_4) = 1$
- The labelling $\mathbf{f} = \{f_{v_1}, f_{v_2}, f_{v_3}, f_{v_3}, f_{v_4}, f_{v_5}\}$



Examples of \uncover, \visible & \only (Cont.)

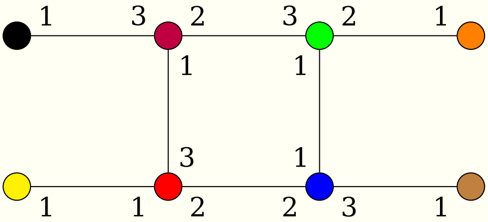


Examples of \uncover, \visible & \only (Cont.)



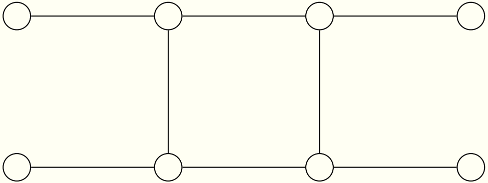
$$s_{\mathbf{f}} = 1$$

Examples of \uncover, \visible & \only (Cont.)

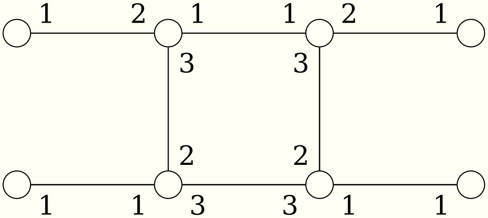


$$s_{\mathbf{f}} = 1$$

Examples of \uncover, \visible & \only (Cont.)

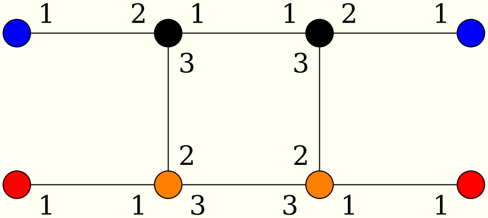


Examples of \uncover, \visible & \only (Cont.)



$$s_{\mathbf{f}} = 2$$

Examples of \uncover, \visible & \only (Cont.)



$$s_{\mathbf{f}} = 2$$

References

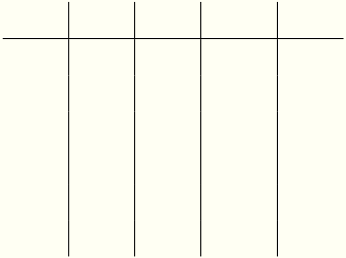
- Angluin, Dana (1980). “Local and global properties in networks of processors”. In: *Proceedings of the twelfth annual ACM symposium on Theory of computing*. Acm, pp. 82–93 (cit. on p. 4).
- Yamashita, Masafumi and Tsunehiko Kameda (1996). “Computing on anonymous networks: part I—characterizing the solvable cases”. In: *IEEE Transactions on parallel and distributed systems* 7.1, pp. 69–89 (cit. on p. 5).

Thank you very much!

Q & A

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:



$$1 \leq s_{\mathbf{f}} \leq 36$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1				
v_1				

$$1 \leq s_{\mathbf{f}} \leq 36$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2			
v_1	v_2			

$$1 \leq s_{\mathbf{f}} \leq 18$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2			
v_1	v_2			
	v_3			

$$2 \leq s_{\mathbf{f}} \leq 18$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3		
v_1	v_2	v_4		
	v_3			

$$2 \leq s_{\mathbf{f}} \leq 12$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
	v_3			

$$2 \leq s_{\mathbf{f}} \leq 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
	v_3	v_6		

$$2 \leq s_{\mathbf{f}} \leq 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
	v_3	v_6	v_7	

$$2 \le s_{\mathbf{f}} \le 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
v_8	v_3	v_6	v_7	

$$2 \leq s_{\mathbf{f}} \leq 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
v_8	v_3	v_6	v_7	
		v_9		

$$3 \leq s_{\mathbf{f}} \leq 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
v_8	v_3	v_6	v_7	
		v_9	v_{10}	

$$3 \leq s_{\mathbf{f}} \leq 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
v_8	v_3	v_6	v_7	
		v_9	v_{10}	
			v_{11}	

$$6 \leq s_{\mathbf{f}} \leq 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	
v_1	v_2	v_4	v_5	
v_8	v_3	v_6	v_7	
		v_9	v_{10}	
			v_{11}	
			v_{12}	

$$6 \leq s_{\mathbf{f}} \leq 9$$

One More Example

Given a graph with 36 vertices, $s_{\mathbf{f}}$ can be 1, 2, 3, 4, 6, 9, 12, 18 or 36:

T_1	T_2	T_3	T_4	T_5
v_1	v_2	v_4	v_5	$\square$
v_8	v_3	v_6	v_7	
$\square$	$\square$	v_9	v_{10}	
		$\square$	v_{11}	
			v_{12}	
			$\square$	

$$6 \leq s_{\mathbf{f}} \leq 9$$

The squares above are v_{13}'s possible places.

Can You Explain the Order of Terms in List of Symbols?

- It is automatically generated by the external *MakeIndex* program along with LaTeX package `nomencl`, using default settings
- Yes, it even looks bizarre to me as well

Your Paper is Hard to Understand . . .

After today's presentation, do you feel a little better?

$$\text{Your answer} = \begin{cases} \text{Yes} & \text{Phew, thank you!} \\ \text{No} & \text{Is it too late to say sorry?} \end{cases}$$