

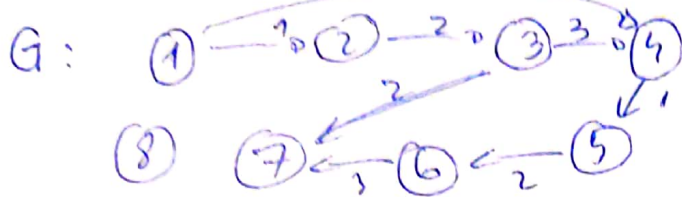
# Topological algorithm

sorting

using

predecessor

counting



topological sorting orders:

8, 1, 2, 3, 4, 5, 6, 7

1, 8, 2, 3, 4, 5, 6, 7

	x, y	count - dictionary	q: queue	sorted: list																
initialization		<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>1</td><td>1</td><td>2</td><td>1</td><td>1</td><td>2</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	1	1	2	1	1	2	0	$\leftarrow [1, 8] \leftarrow$	$[ ]$
1	2	3	4	5	6	7	8													
0	1	1	2	1	1	2	0													
iteration 1	x=1 y=2 y=4	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	1	1	1	1	2	0	$\leftarrow [8] \leftarrow$ $\leftarrow [8, 2] \leftarrow$	$[1]$
1	2	3	4	5	6	7	8													
0	0	1	1	1	1	2	0													
iteration 2	x=8	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	1	1	1	1	2	0	$\leftarrow [2] \leftarrow$	$[1, 8]$
1	2	3	4	5	6	7	8													
0	0	1	1	1	1	2	0													
iteration 3	x=2 y=3	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>2</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	0	1	1	1	2	0	$\leftarrow [4] \leftarrow$	$[1, 8, 2]$
1	2	3	4	5	6	7	8													
0	0	0	1	1	1	2	0													
iteration 4	x=3 y=4 y=7	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	0	0	1	1	1	0	$\leftarrow [7] \leftarrow$	$[1, 8, 2, 3]$
1	2	3	4	5	6	7	8													
0	0	0	0	1	1	1	0													
iteration 5	x=4 y=5	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	0	0	0	1	1	0	$\leftarrow [5] \leftarrow$	$[1, 8, 2, 3, 4]$
1	2	3	4	5	6	7	8													
0	0	0	0	0	1	1	0													
iteration 6	x=5 y=6	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	0	0	0	0	1	0	$\leftarrow [6] \leftarrow$	$[1, 8, 2, 3, 4, 5]$
1	2	3	4	5	6	7	8													
0	0	0	0	0	0	1	0													
iteration 7	x=6 y=7	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	0	0	0	0	0	0	$\leftarrow [7] \leftarrow$	$[1, 8, 2, 3, 4, 5, 6]$
1	2	3	4	5	6	7	8													
0	0	0	0	0	0	0	0													
iteration 8	x=7	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>	1	2	3	4	5	6	7	8	0	0	0	0	0	0	0	0	$\leftarrow$ stop.	$[1, 8, 2, 3, 4, 5, 6, 7]$ size of (sorted) = 8
1	2	3	4	5	6	7	8													
0	0	0	0	0	0	0	0													