

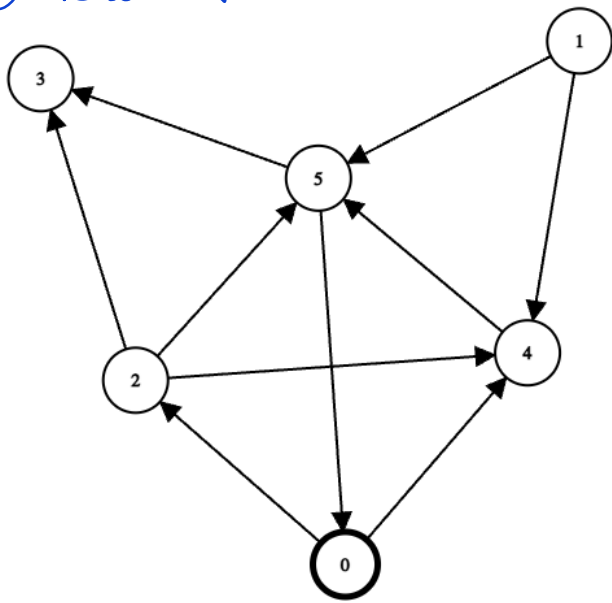
Assignment 2

Wednesday, 26 April 2023

13:12

Lowest length path between s and t using backward breadth-first from t

① From 1 to 2



N_{in} -dictionary

key value

0	- [5]
1	- []
2	- [0]
3	- [2, 5]
4	- [0, 1, 2]
5	- [1, 2, 4]

$s = 1, t = 2$	x	y	queue: q	dist - dictionary	next - dictionary	visited																								
initialization			$\leftarrow 2 \leftarrow$	<table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td></td><td></td><td>0</td><td></td><td></td><td></td></tr></table>	0	1	2	3	4	5			0				<table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	0	1	2	3	4	5							$\{2\}$
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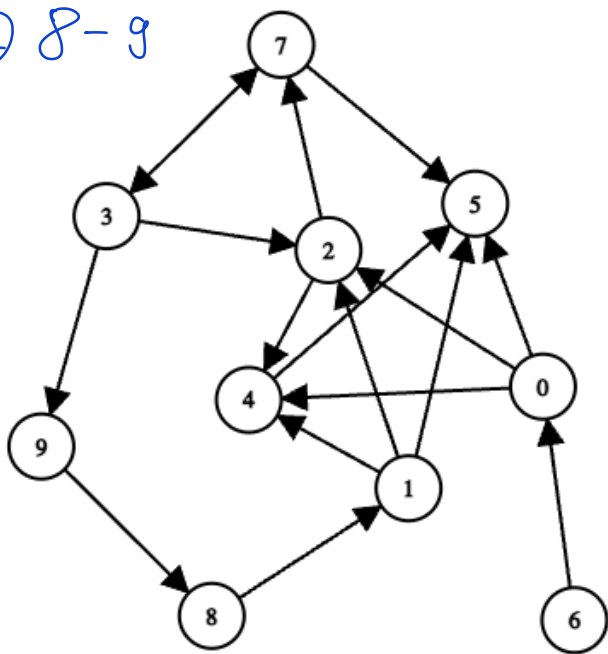
$y=s=1 \Rightarrow \text{STOP}$

The path is built from next-dictionary beginning with $s=1$

$s=1, \text{next}[1]=5, \text{next}[5]=0, \text{next}[0]=2=t$

path = [1, 5, 0, 2], length = dist[s] = dist[1] = 3

② 8-9



N_{in} -dictionary

key value

0	- [6]
1	- [8]
2	- [0, 1, 3]
3	- [7]
4	- [0, 1, 2]
5	- [0, 1, 4, 7]
6	- [3]
7	- [2, 3]
8	- [9]
9	- [3]

$s=8, t=9$	x	y	queue: q	dist_dictionary	next_dictionary	visited																																								
initialization			$\leftarrow 9 \leftarrow$	<table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td></tr></table>	0	1	2	3	4	5	6	7	8	9										0	<table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	0	1	2	3	4	5	6	7	8	9											$\{9\}$
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0	1	2	3	4	5	6	7	8	9																																					
2	2	7	1			0	3	1																																						

$y=s=8 \Rightarrow \text{STOP!}$

The path is built from next-dictionary beginning with $s=8$

0	1	2	3	4	5	6	7	8	9
2	2	7	1			0	3	1	

$s=8, \text{next}[8]=1 \rightarrow \text{next}[1]=2 \rightarrow \text{next}[2]=7 \rightarrow \text{next}[7]=3 \rightarrow \text{next}[3]=9=t$
path [8, 1, 2, 7, 3, 9], length = dist[s] = dist[8] = 5

- graph1k: 1-100: length=6
path=[1, 5, 487, 175, 699, 624, 100]
- 100-1: length=5
path=[100, 416, 354, 865, 109, 1]
- graph10k: 1-100: length=8
path=[1, 7317, 4118, 2404, 690, 1494, 739, 4722, 100]
- 100-1: length=7
path=[100, 5568, 2781, 1451, 4397, 528, 4260, 1]
- graph100k: 1-100: length=8
path=[1, 17024, 27471, 14969, 3075, 4156, 32753, 14973, 100]
- 100-1: length=8
path=[100, 44340, 54527, 6606, 53263, 95230, 28655, 58288, 1]