Manual execution

Topological sorting using predecessor counting

G:

$$\begin{tikzcd}
 & 1 \arrow[d] \arrow[dr] & & \\
 & 2 \arrow[r] \arrow[dl] \arrow[d] & 3 \arrow[d] \arrow[dr] & \\
4 \arrow[r] & 5 \arrow[r] \arrow[d] & 6 \arrow[r] \arrow[dl] & 7 \\
 & 8 & &
\end{tikzcd}$$

Topological sorting orders:

I 1 2 3 4 5 6 7 8
~~II 1 3 2 6 7 4 5 8~~
~~III 1 2 4 5 3 6 7 8~~
II 1 2 3 4 5 6 8 7
III 1 2 4 5 3 6 7 8
IV 1 2 4 5 3 6 8 7
V 1 2 4 3 5 6 7 8
VI 1 2 4 3 5 6 8 7

	X, Y	count: dictionary	q: queue	sorted: list
initialization		1 2 3 4 5 6 7 8 0 1 2 1 2 2 2 2	← 1 ←	[]

iteration 1	X = 1
	Y = 2
	Y = 3
		1 2 3 4 5 6 7 8
		0 0 1 1 2 2 2 2
			← ←
			← 2 3 ←
				[1]

iteration 2	X = 2
	Y = 4
	Y = 5
	Y = 3
		1 2 3 4 5 6 7 8
		0 0 0 0 1 2 2 2
			← 3 ←
			← 3 4 5 ←
				[1, 2]

iteration 3	X = 3
	Y = 6
	Y = 7
		1 2 3 4 5 6 7 8
		0 0 0 0 1 1 1 2
			← 4 5 ←
			← 4 5 6 7 ←
				[1, 2, 3]

iteration 4	X = 4
	Y = 5
		1 2 3 4 5 6 7 8
		0 0 0 0 0 1 1 2
			← 5 6 7 ←	[1, 2, 3, 4]

iteration 5	X = 5
	Y = 6
	Y = 8
		1 2 3 4 5 6 7 8
		0 0 0 0 0 0 1 1
			← 6 7 ←
			← 6 7 8 ←
				[1, 2, 3, 4, 5]

iteration 6	X = 6
	Y = 7
	Y = 8
		1 2 3 4 5 6 7 8
		0 0 0 0 0 0 0 0
			← 7 8 ←	[1, 2, 3, 4, 5, 6]

iteration 7	X = 7	— 〃 —	← 8 ←	[1, 2, 3, 4, 5, 6, 7]
iteration 8	X = 8	— 〃 —	← ← STOP	[1, 2, 3, 4, 5, 6, 7, 8]

G is a DAG
size of (sorted) = 8