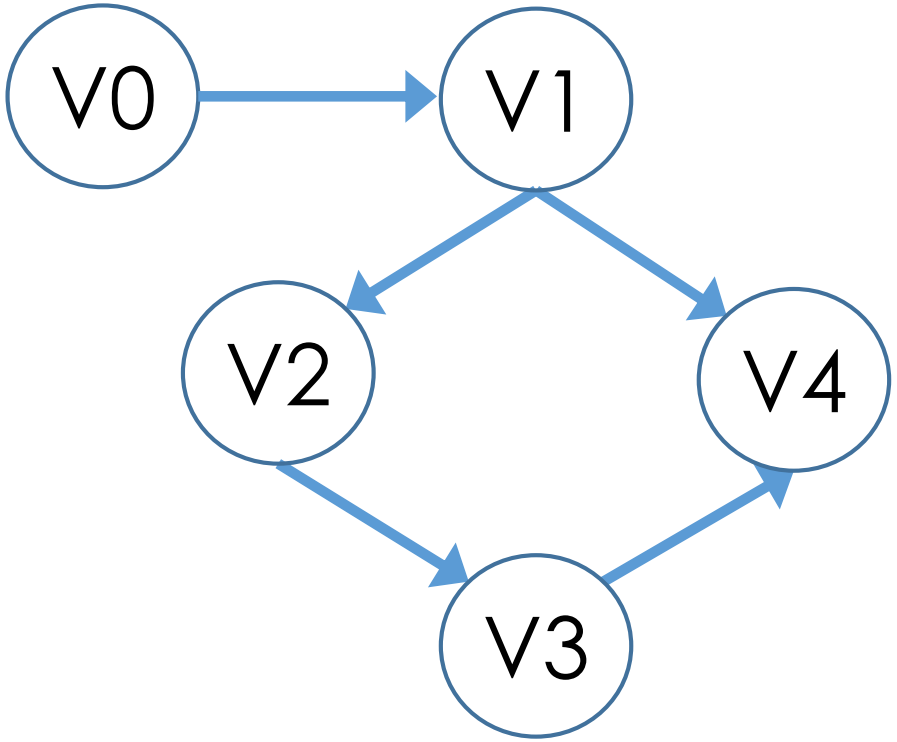
Shortest Path: Breadth First Search

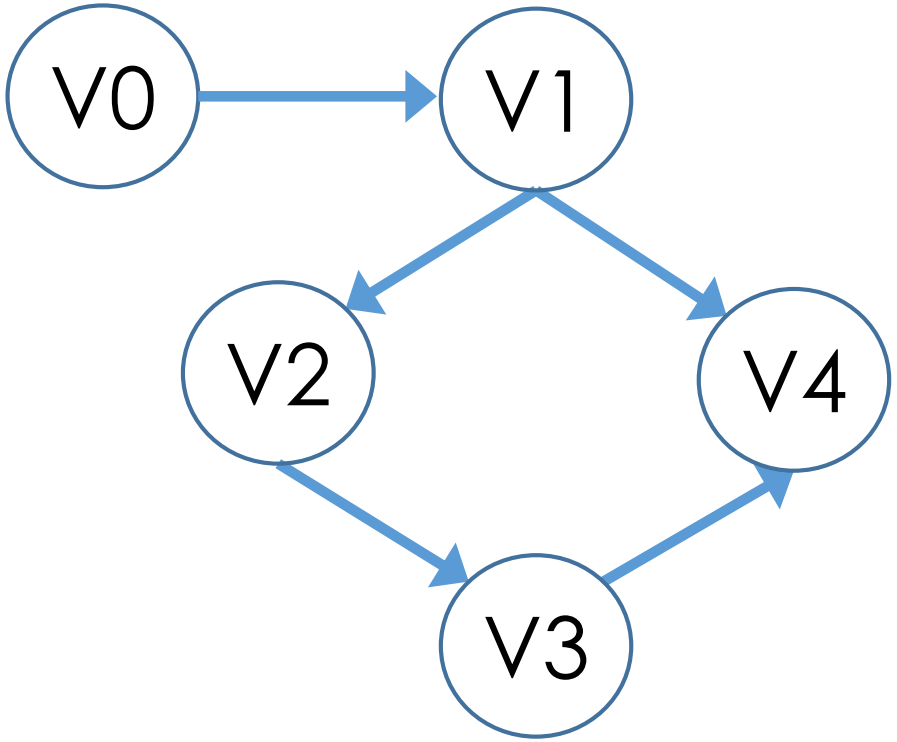
By the end of this video you will be able to…

- Describe Breadth First Search's value for an unweighted graph

Breadth First Search

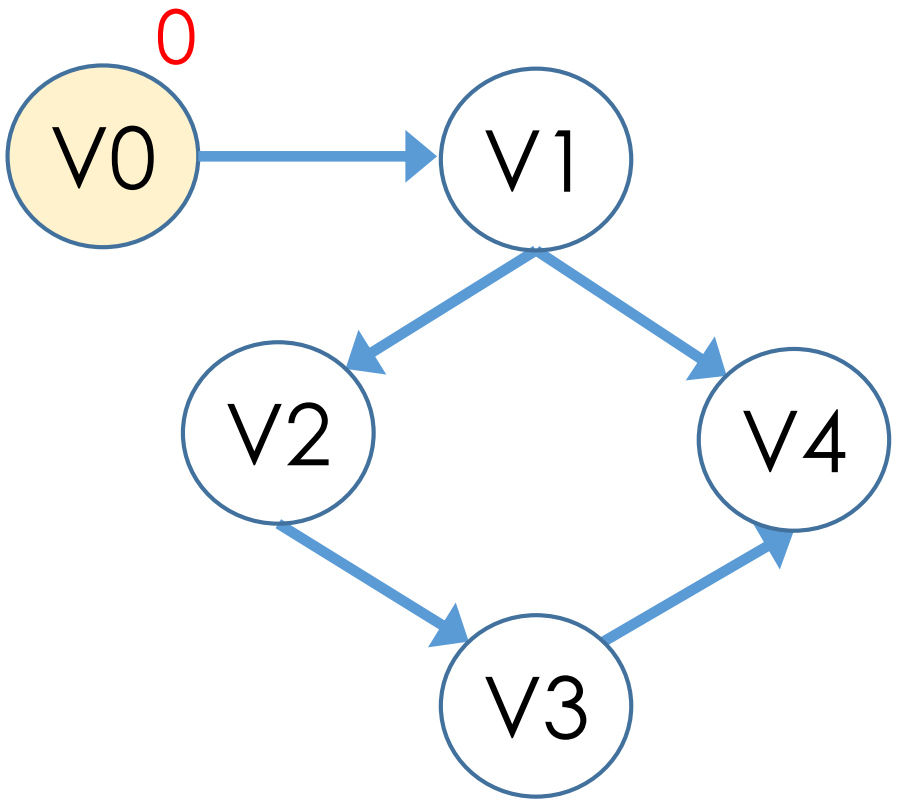


Breadth First Search



Let's try to find the distance from V0 to V4.

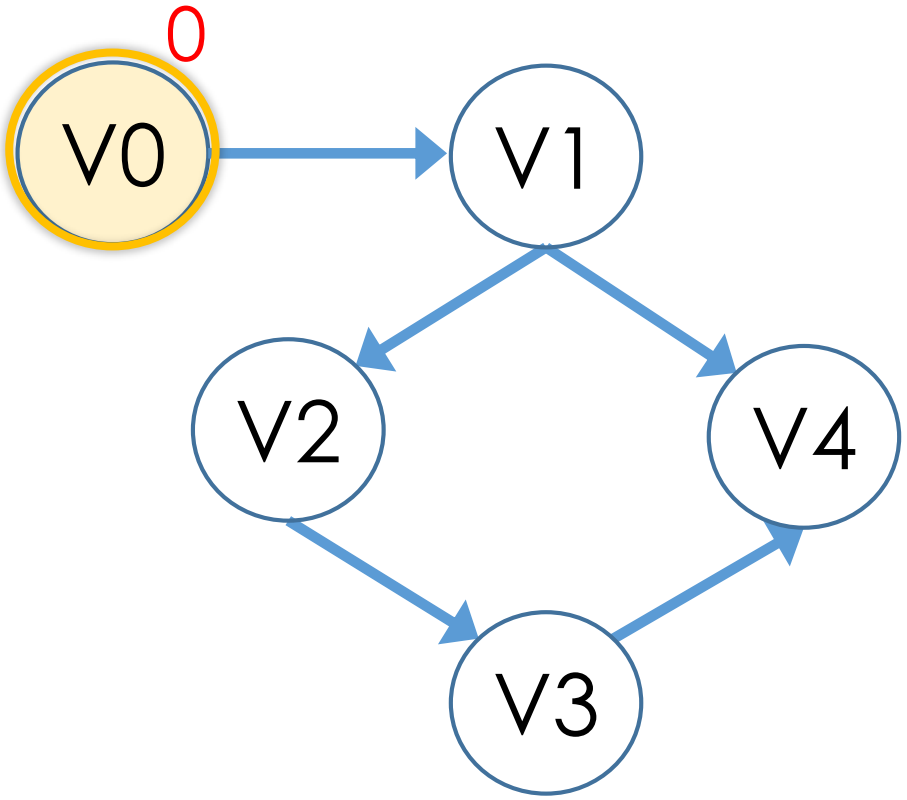
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: V0

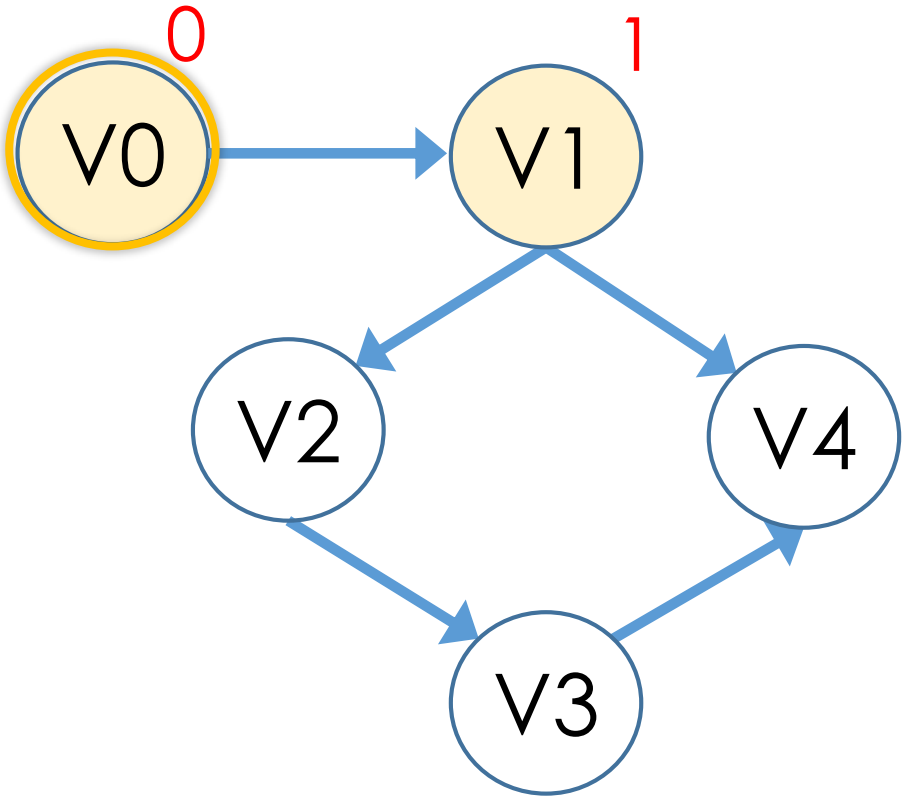
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~

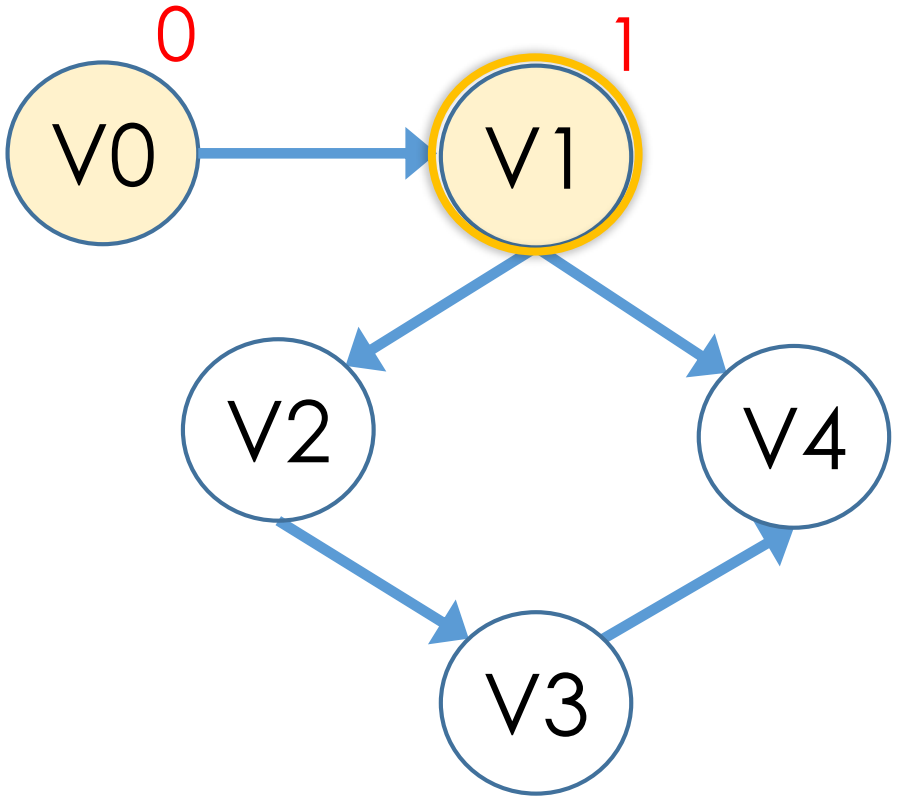
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ V1

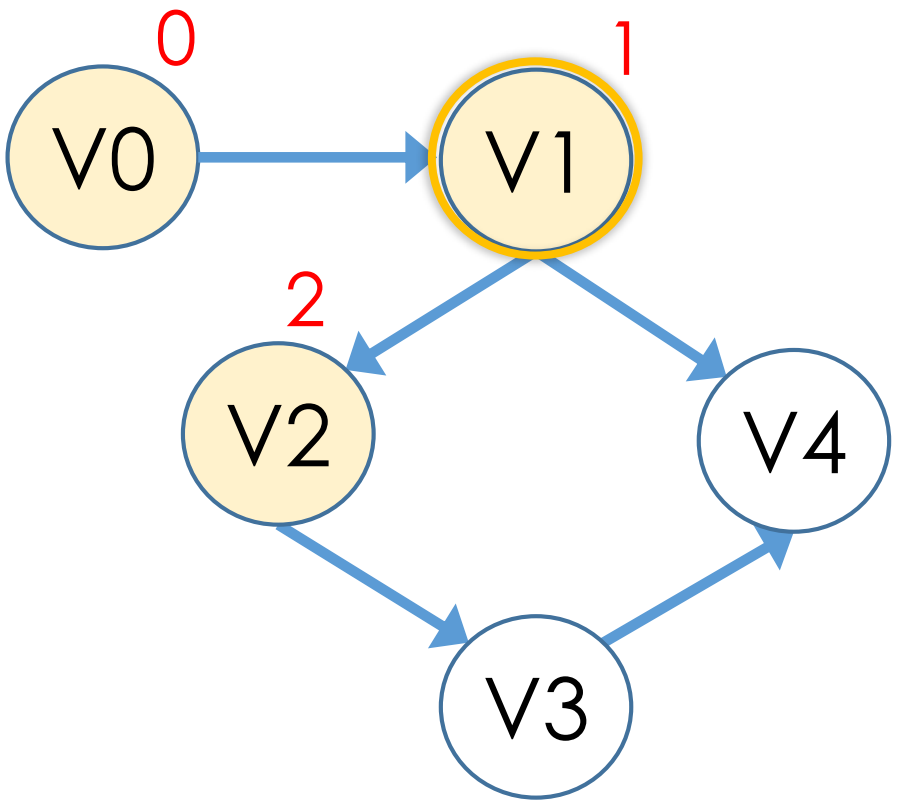
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~

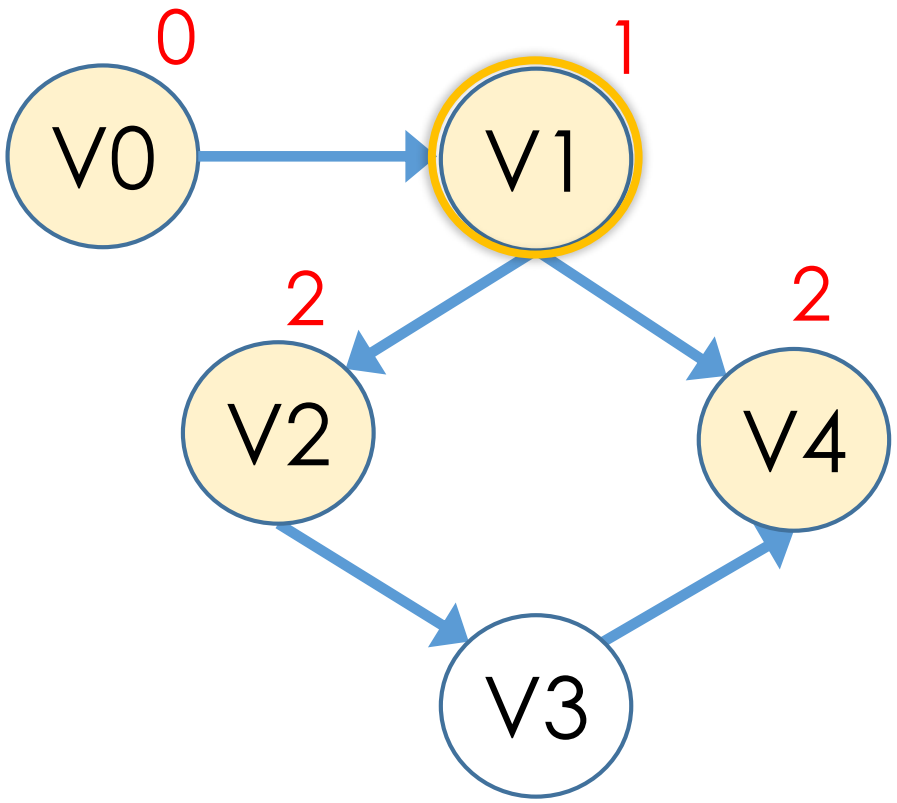
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ V2

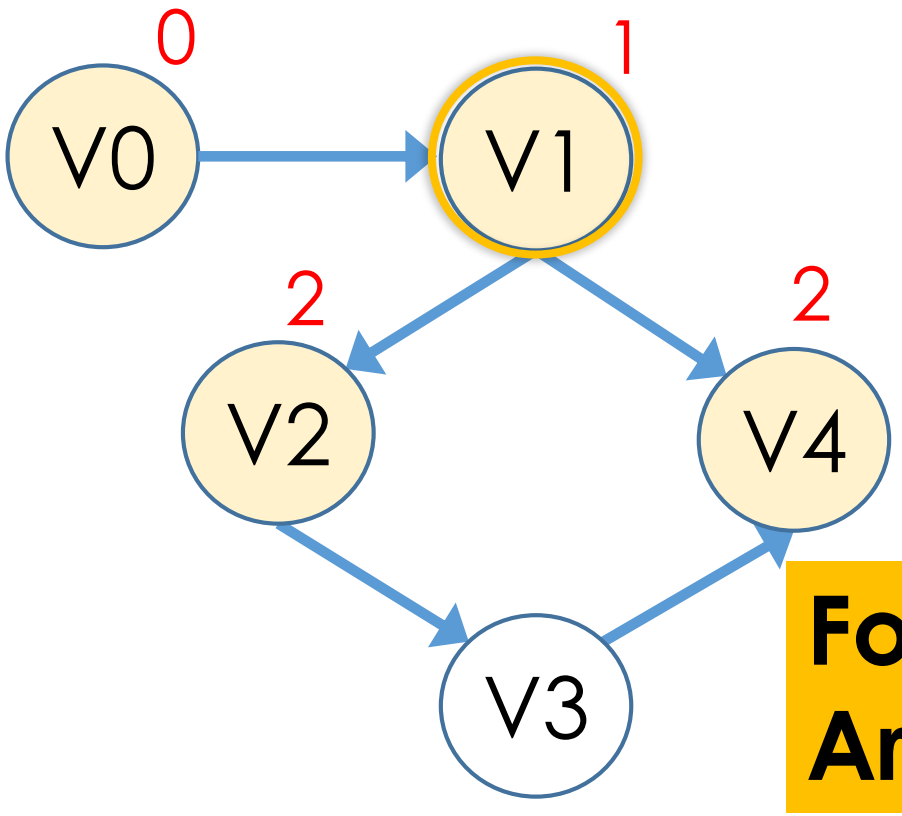
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ V2

Breadth First Search

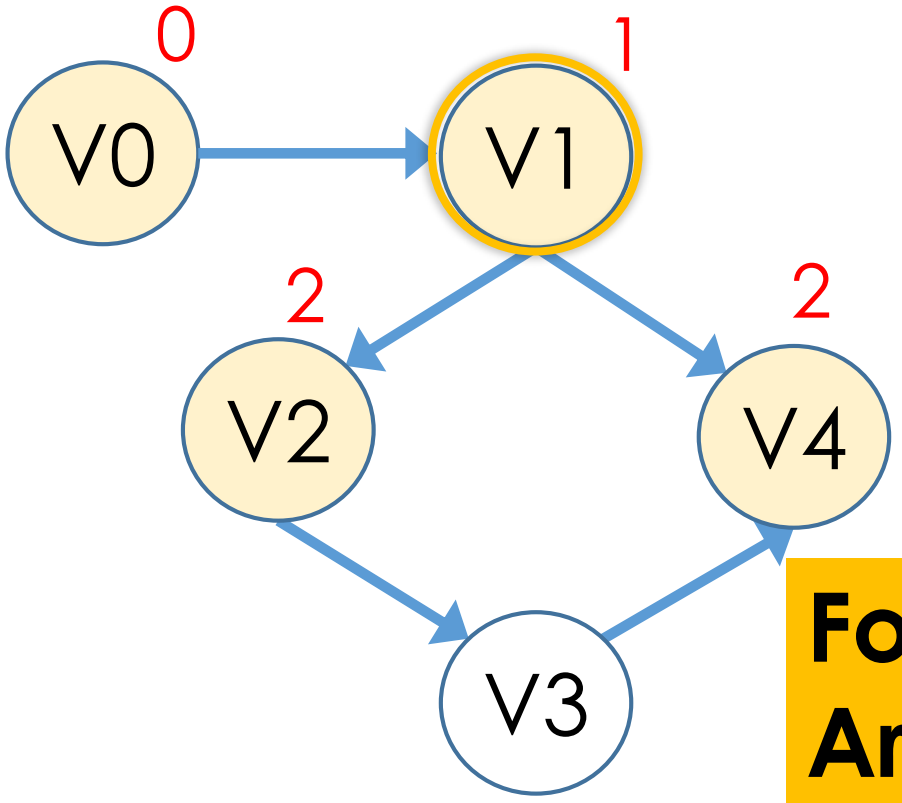


Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ V2

Found V4.
Are we done?

Breadth First Search

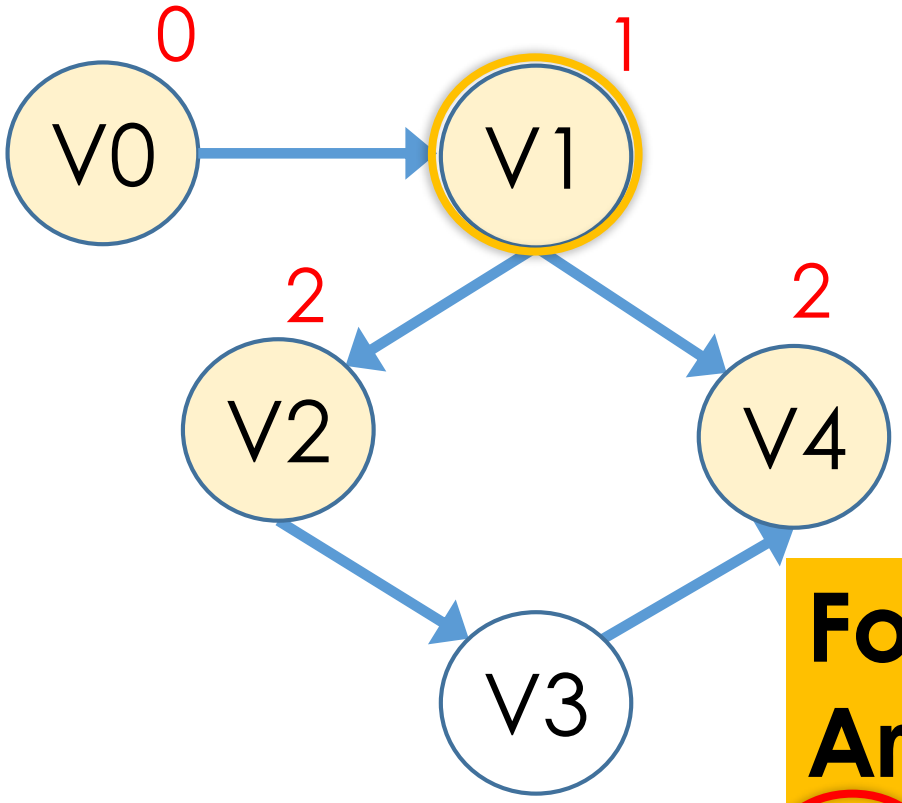


Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ V2

Found V4.
Are we done?
A. Yes
B. No
C. Maybe

Breadth First Search

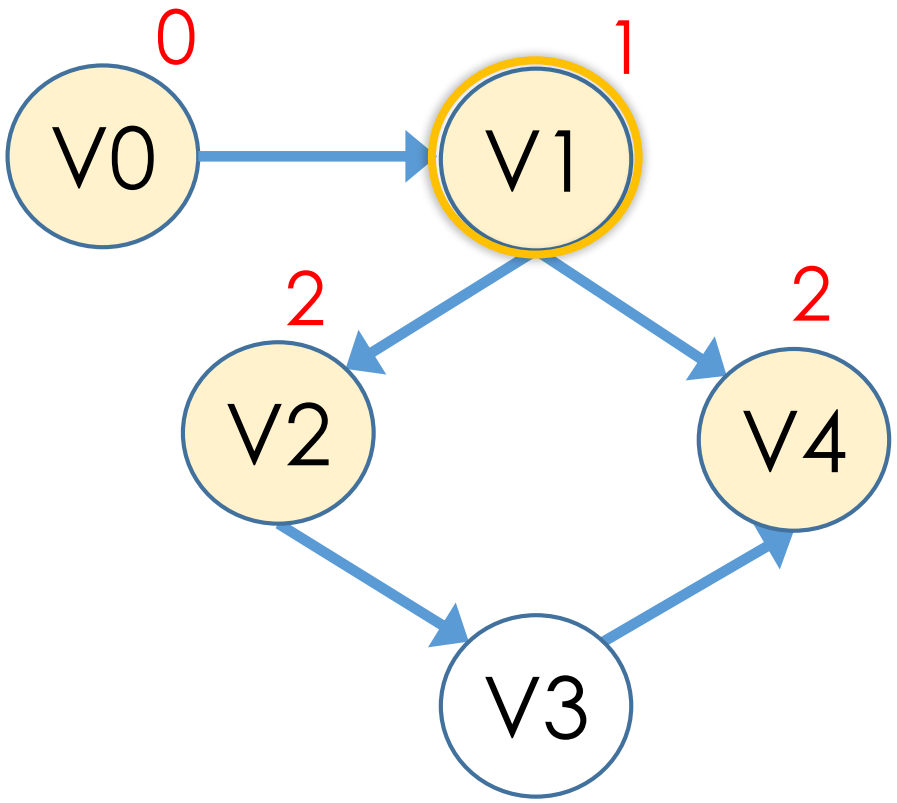


Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ V2

Found V4.
Are we done?
A. Yes
B. No
C. Maybe

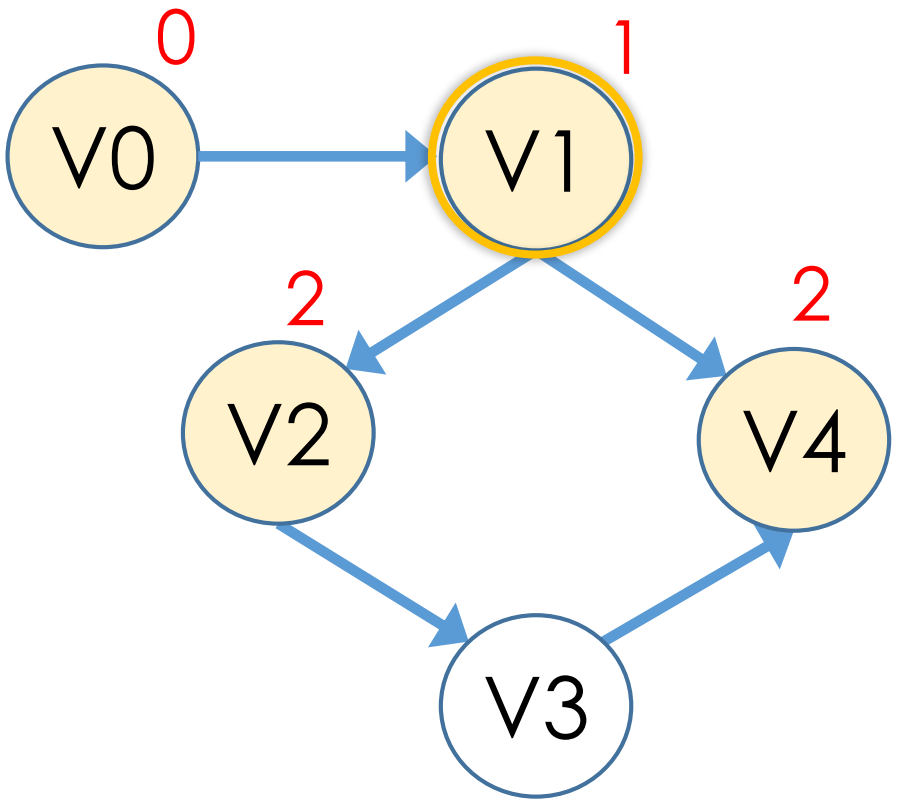
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ V2

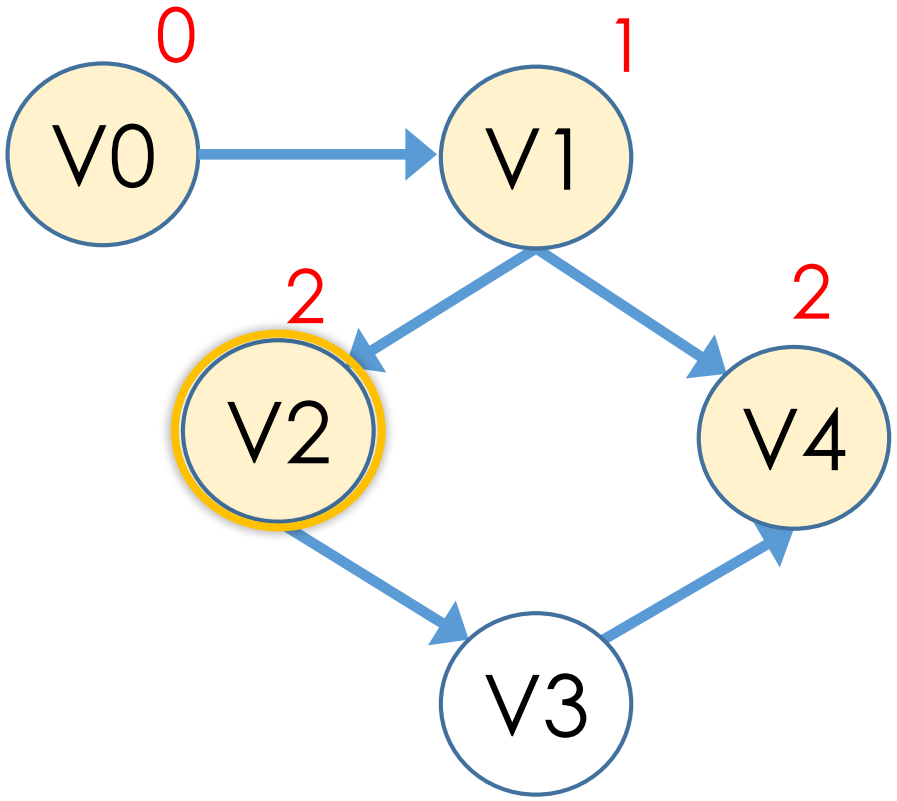
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ V2 | V4

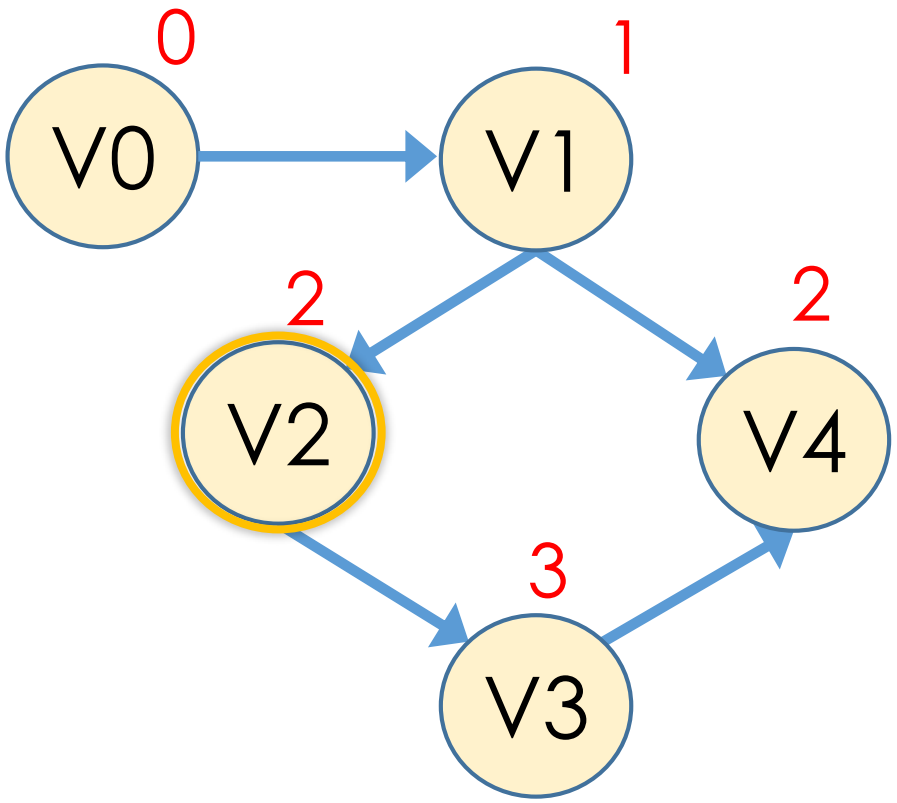
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ ~~V2~~ | V4

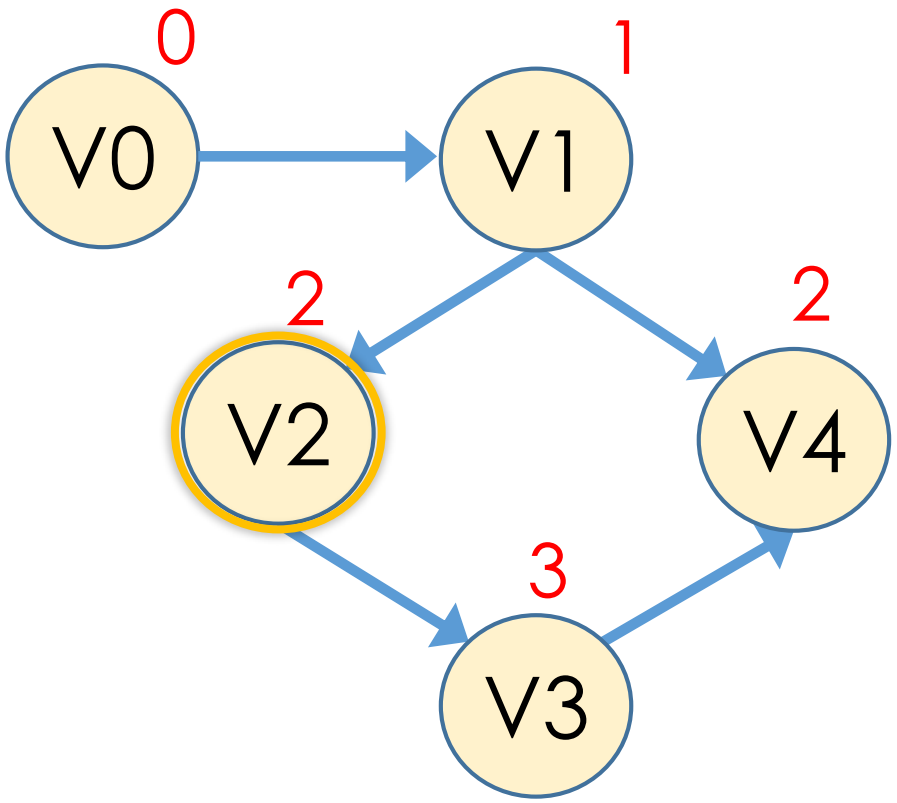
Breadth First Search



Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ ~~V2~~ | V4 V3

Breadth First Search

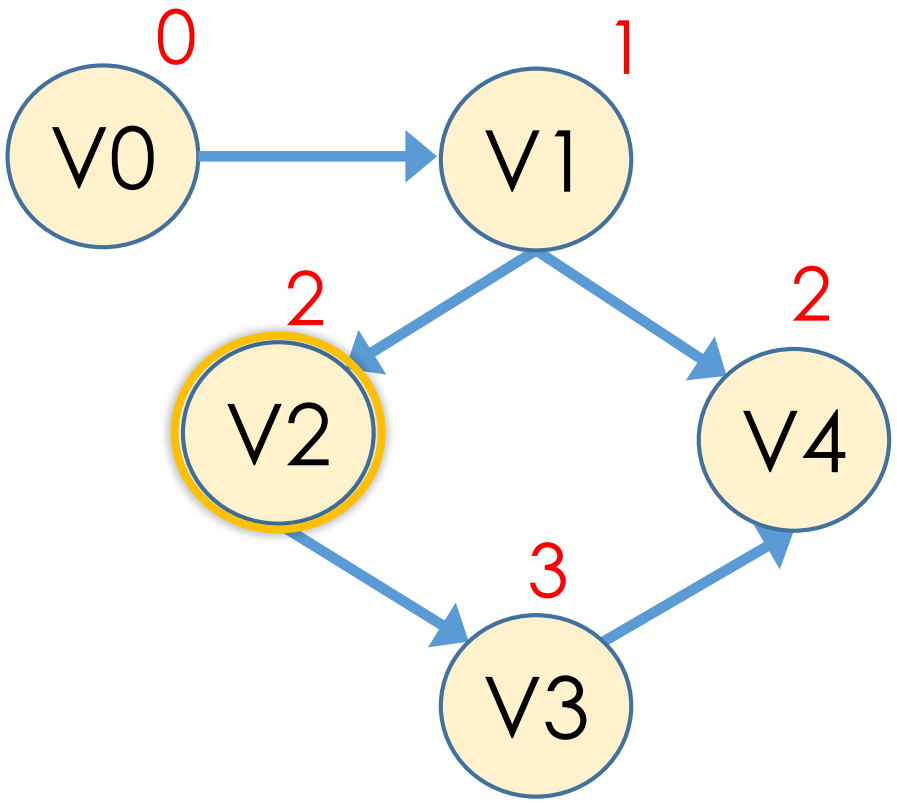


Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ ~~V2~~ | V4 V3

Empty the queue

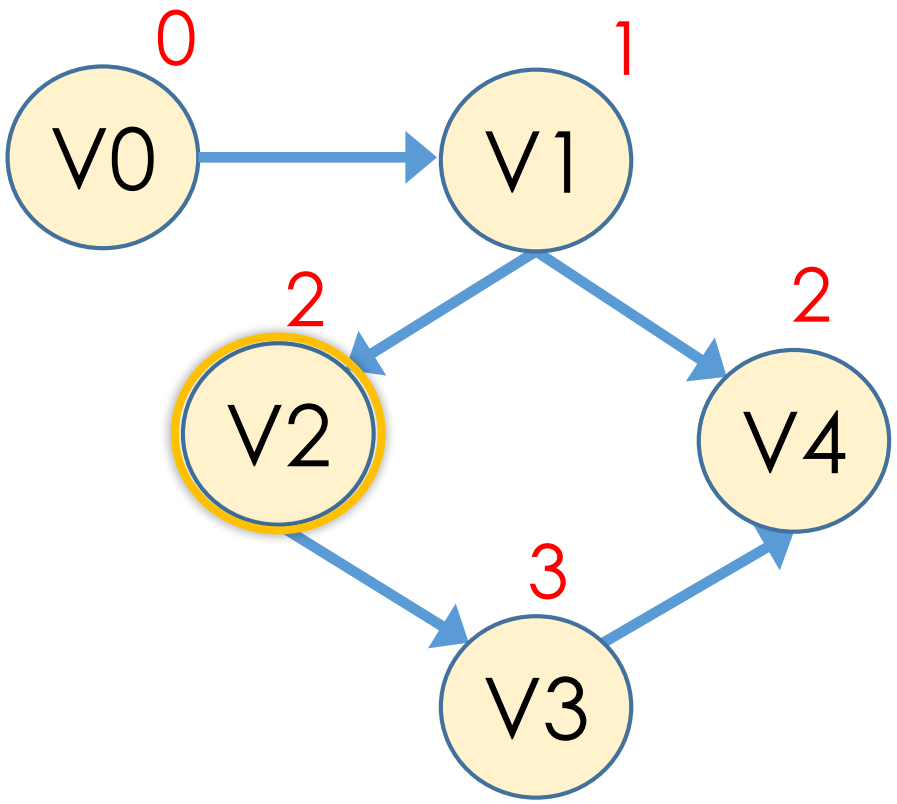
Breadth First Search



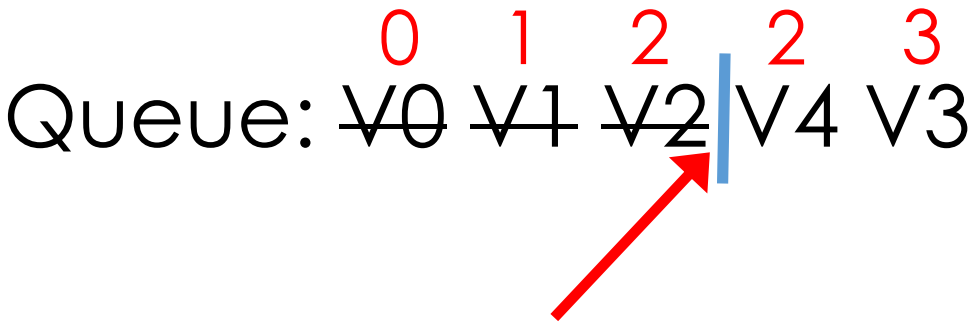
Let's try to find the distance from V0 to V4.

Queue: ~~V0~~ ~~V1~~ ~~V2~~ | V4 V3

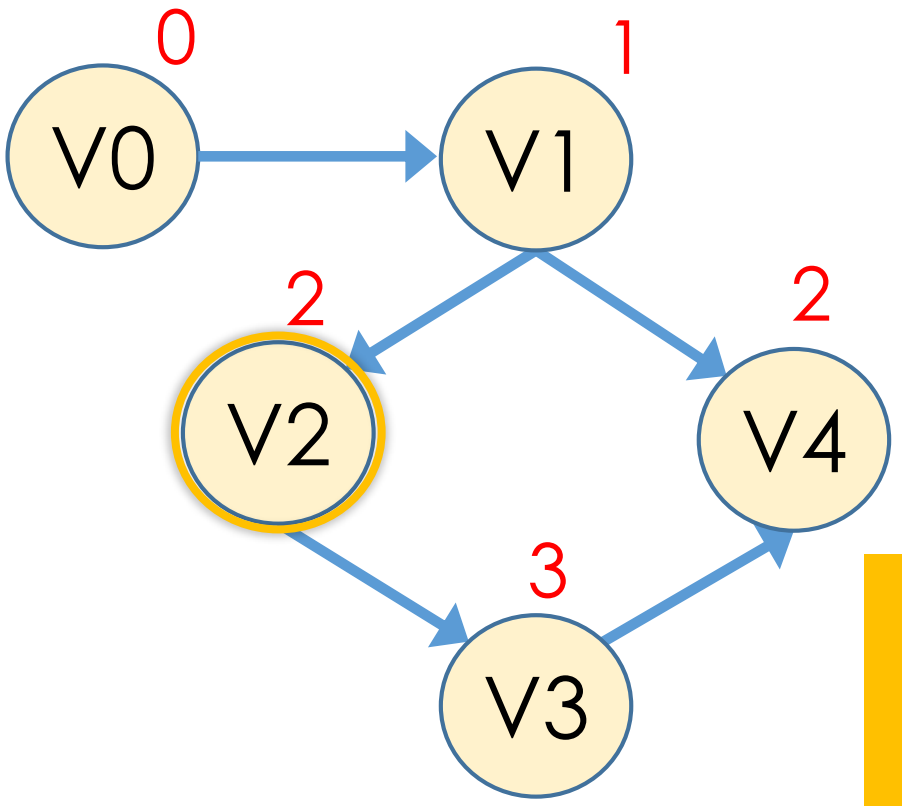
Breadth First Search



Let's try to find the distance from V0 to V4.



Breadth First Search



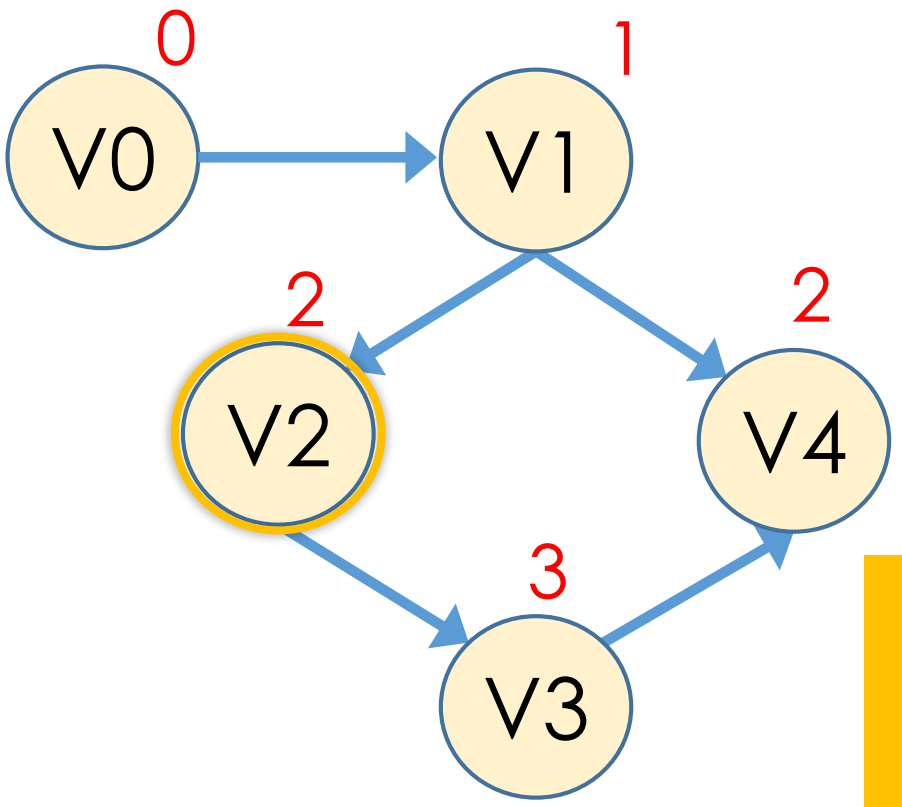
Let's try to find the distance from V0 to V4.

0 1 2 2 3

Queue: ~~V0~~ ~~V1~~ ~~V2~~ | V4 V3

New nodes are as distant or more distant

Breadth First Search



Let's try to find the distance from V0 to V4.

0 1 2 2 3

Queue: ~~V0~~ ~~V1~~ ~~V2~~ | V4 V3

Does BFS work for all graphs?