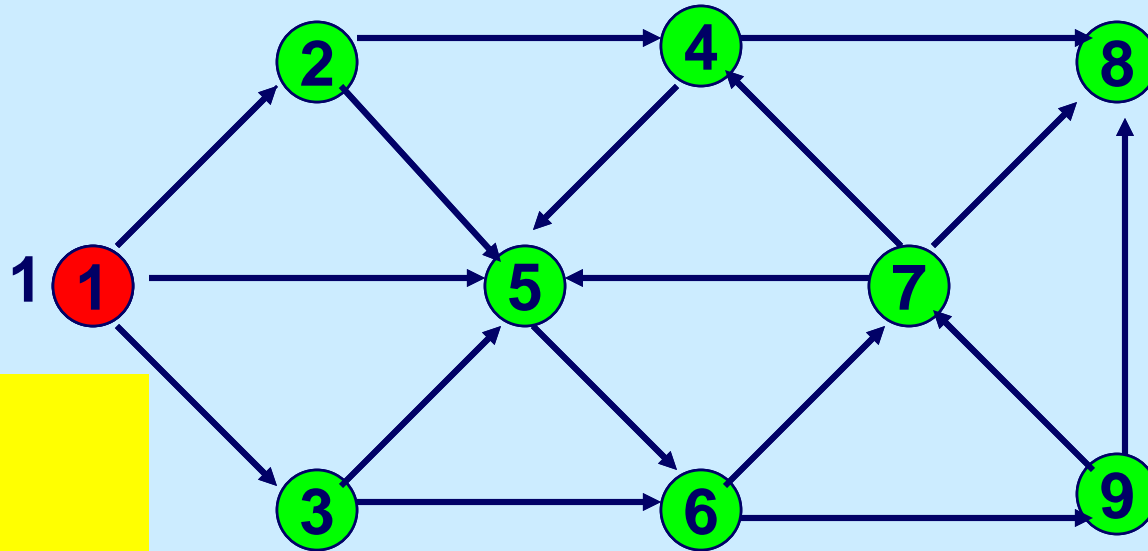


15.082 and 6.855J

Breadth First Search

Breadth first search animation

Initialize



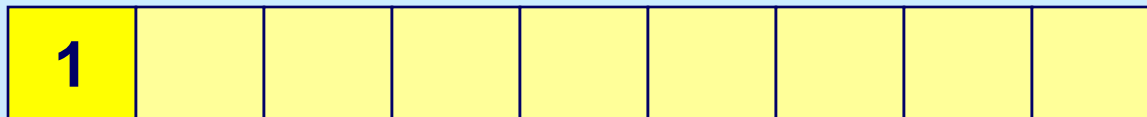
$\text{pred}(1) = 0$

$\text{next} := 1$

$\text{order}(\text{next}) = 1$

$\text{LIST} := \{1\}$

LIST

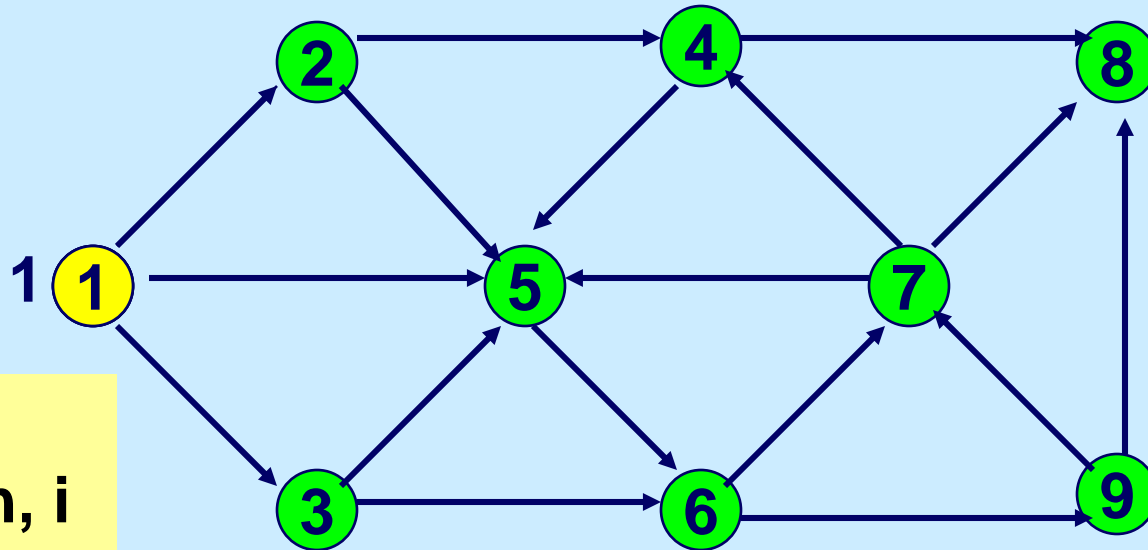


next

1

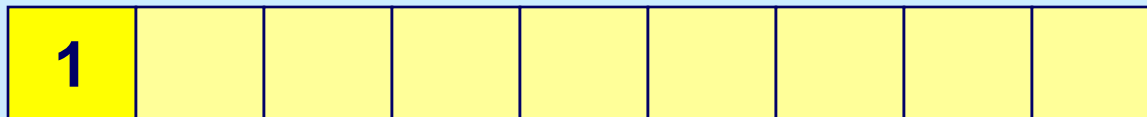
Breadth first search animation

Select a node i in LIST



In breadth first search, i is the first node in LIST

LIST

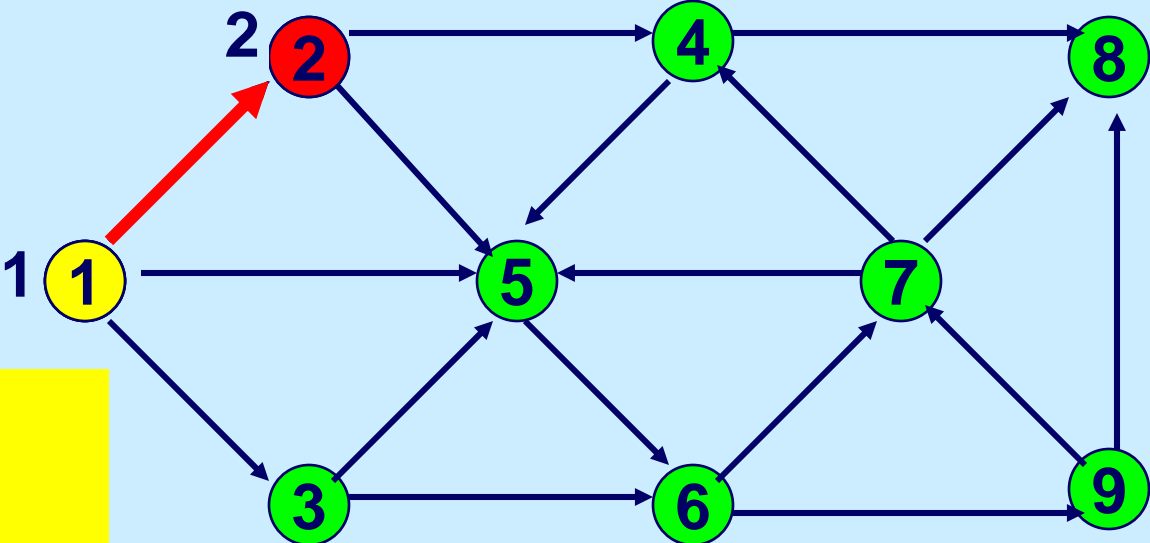


next

1

Breadth first search animation

If node i is incident to an admissible arc...



Next :=
Next + 1
order(j) := next
add j to LIST

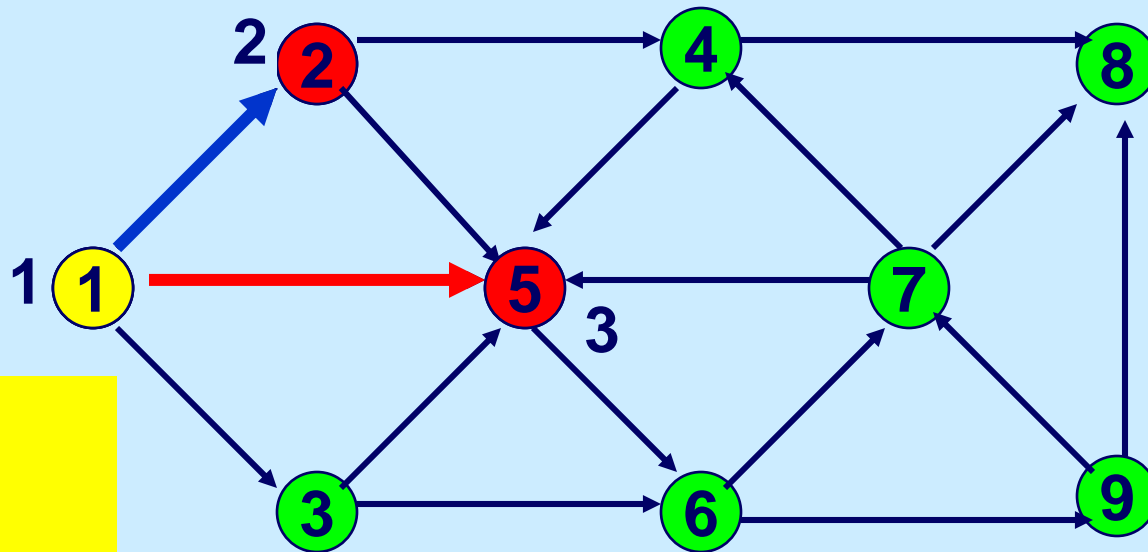
LIST

| | | | | | | | | | |
|---|---|--|--|--|--|--|--|--|--|
| 1 | 2 | | | | | | | | |
|---|---|--|--|--|--|--|--|--|--|

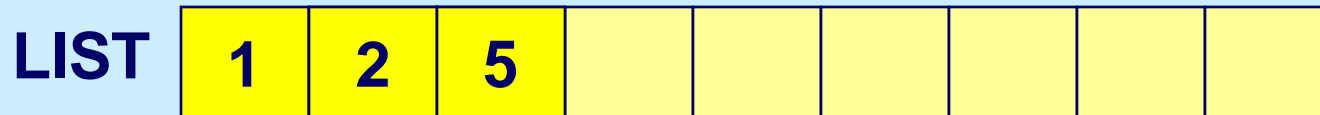
next

| |
|---|
| 2 |
|---|

If node i is incident to an admissible arc...

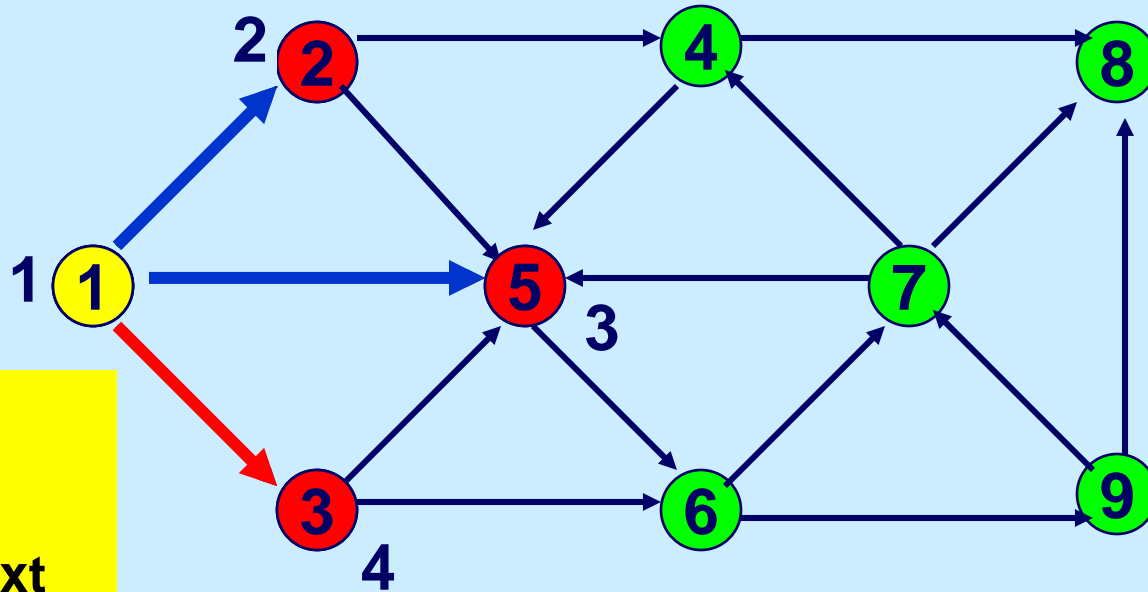


Next :=
Next + 1
order(j) := next
add j to LIST



Breadth first search animation

If node i is incident to an admissible arc...



Next :=
Next + 1
order(j) := next
add j to LIST

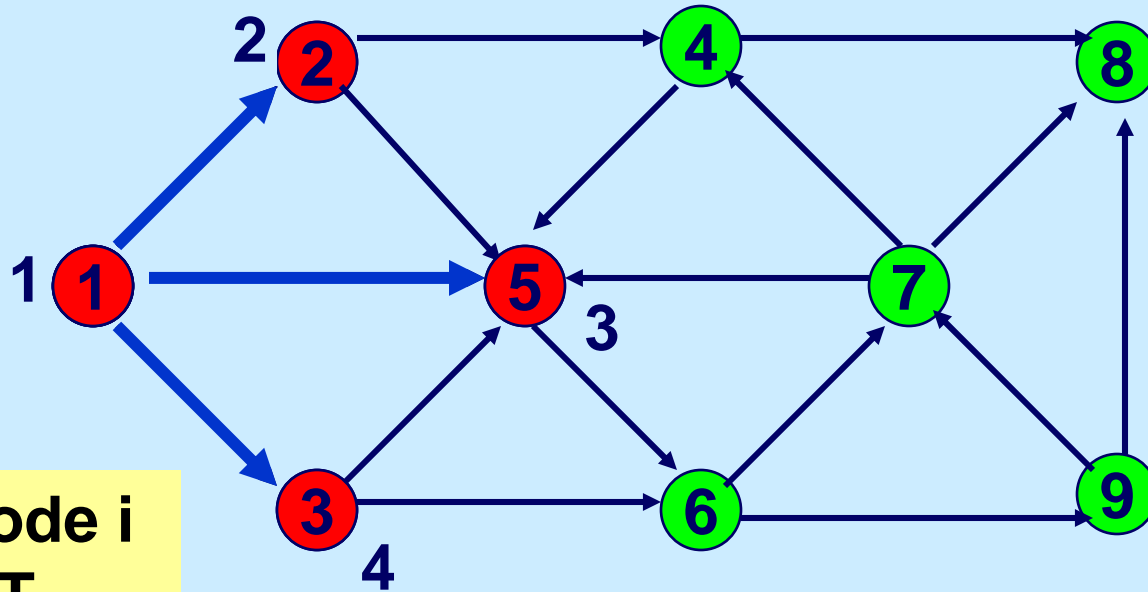
| | | | | | | | | | |
|------|---|---|---|---|--|--|--|--|--|
| LIST | 1 | 2 | 5 | 3 | | | | | |
|------|---|---|---|---|--|--|--|--|--|

next

| |
|---|
| 4 |
|---|

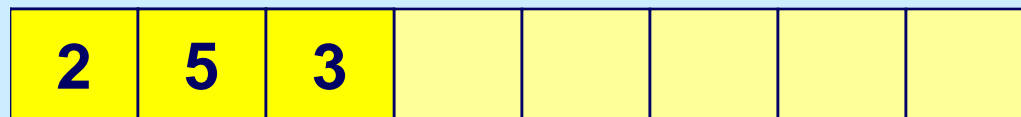
Breadth first search animation

If node i is not incident to an admissible arc...



Delete node i from LIST

LIST

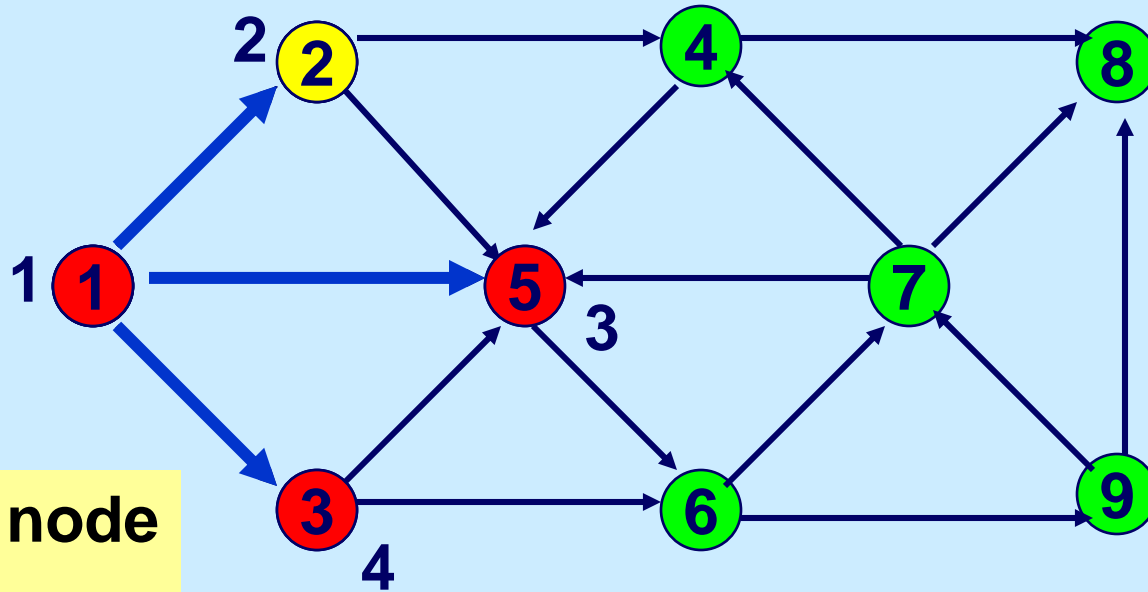


next

4

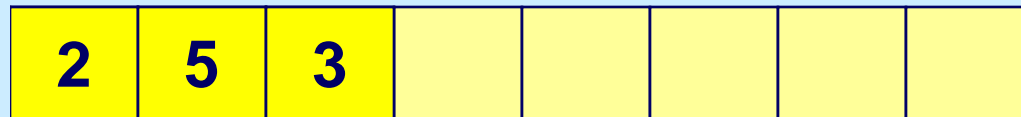
Breadth first search animation

Select Node i



The first node on LIST becomes node i

LIST

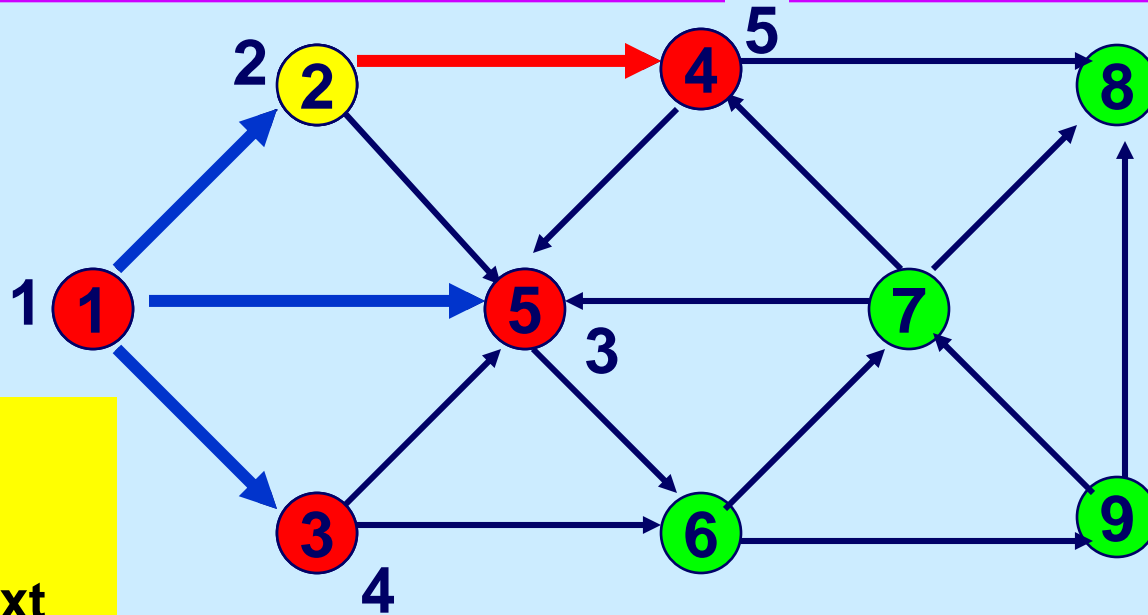


next

4

Breadth first search animation

If node i is incident to an admissible arc...



Next :=
Next + 1
order(j) := next
add j to LIST

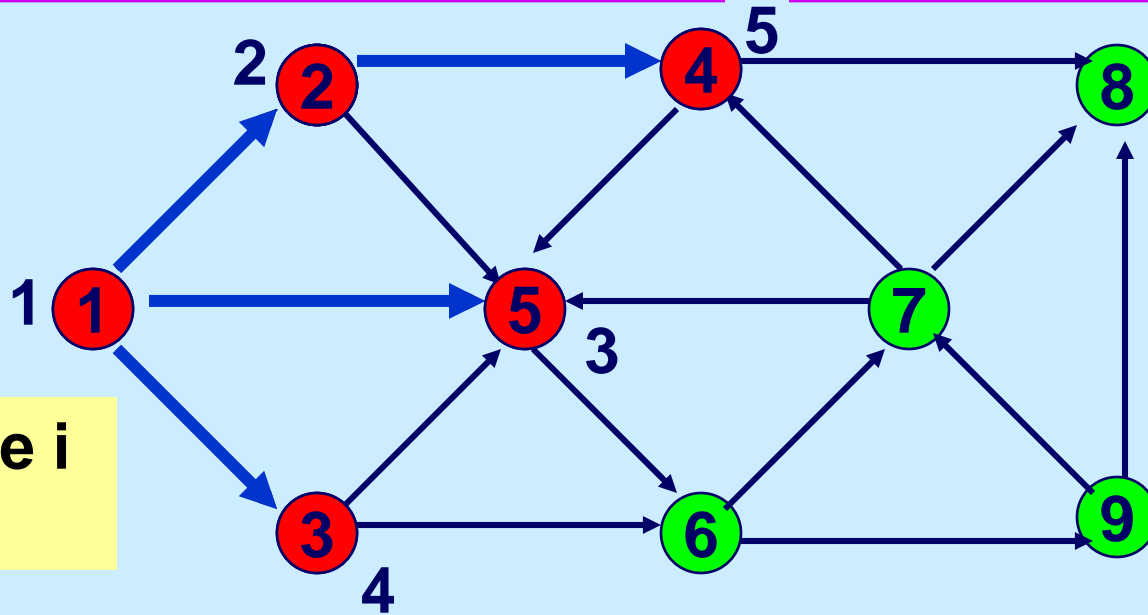
LIST



next 5

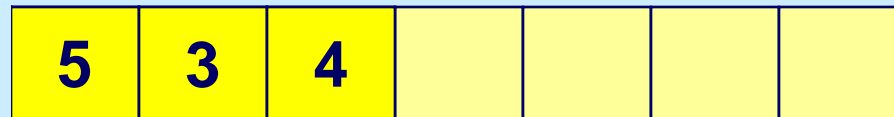
Breadth first search animation

If node i is not incident to an admissible arc...



Delete node i from LIST

LIST

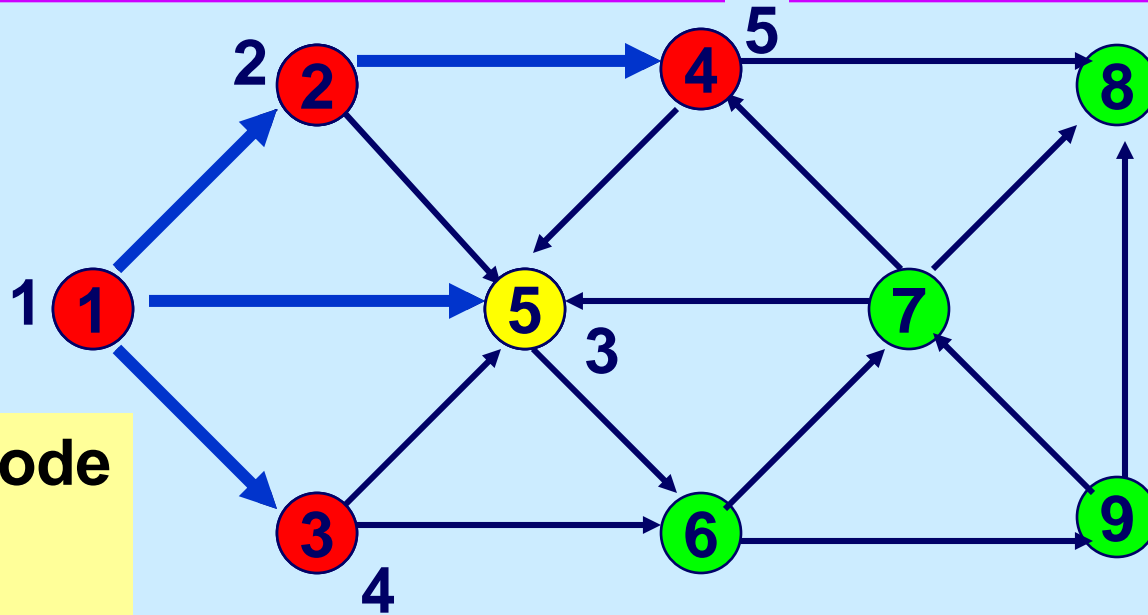


next

5

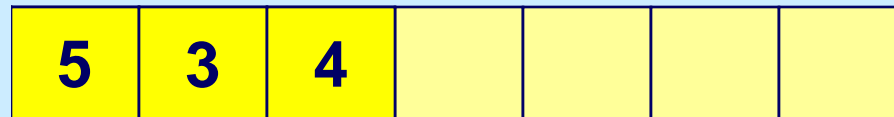
Breadth first search animation

Select a node



The first node on LIST becomes node i

LIST

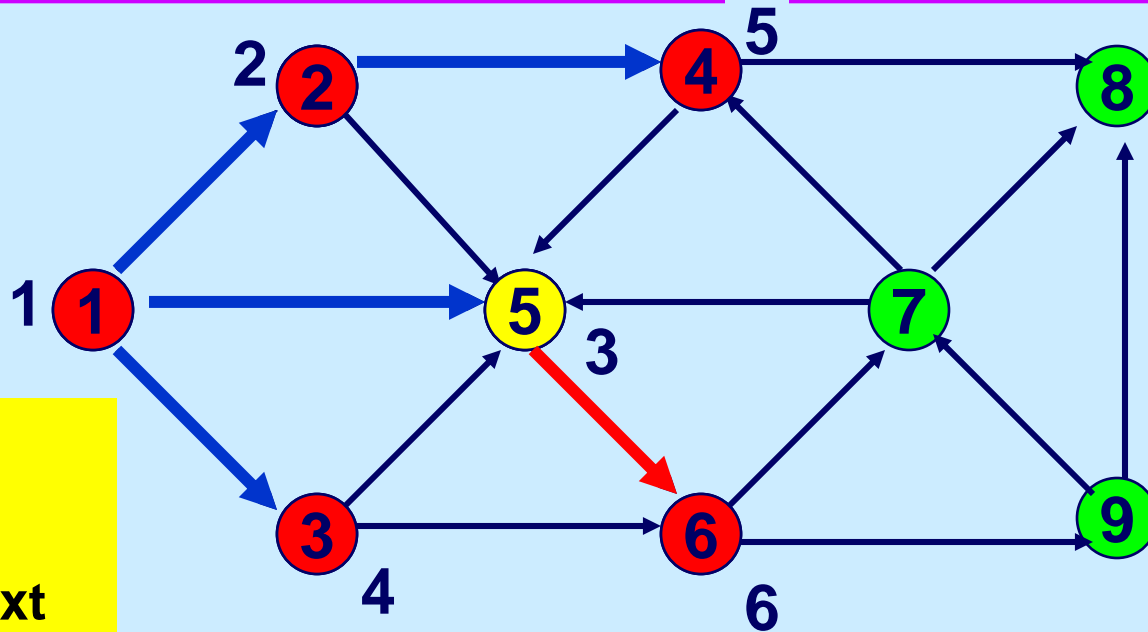


next

5

Breadth first search animation

If node i is incident to an admissible arc...



Next :=
Next + 1
order(j) := next
add j to LIST

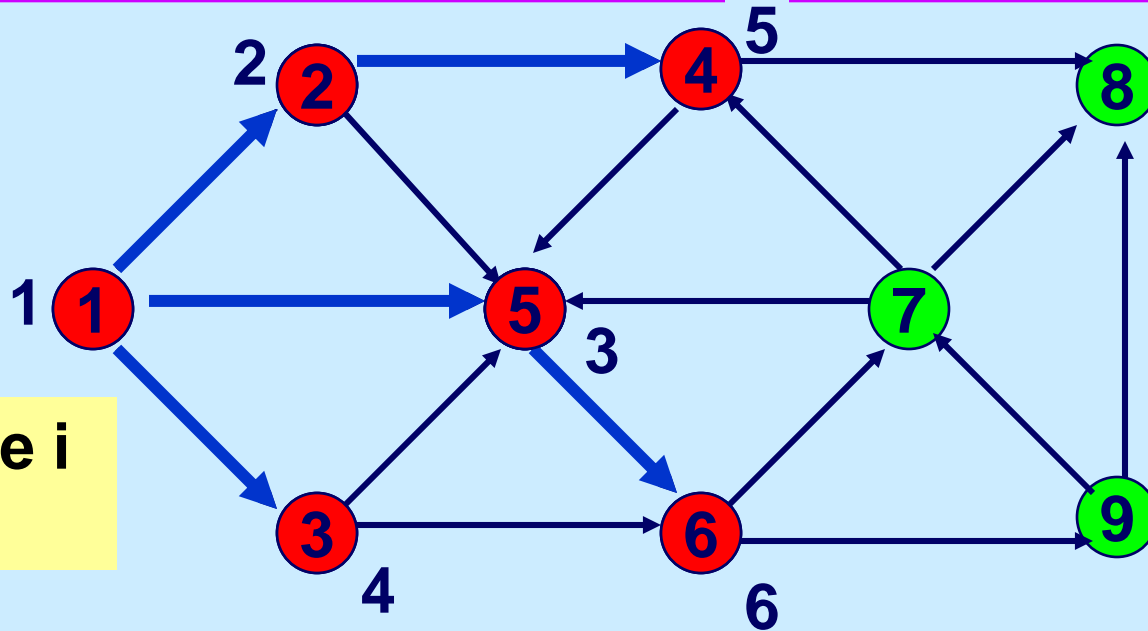
LIST



next 6

Breadth first search animation

If node i is not incident to an admissible arc...



Delete node i from LIST

LIST

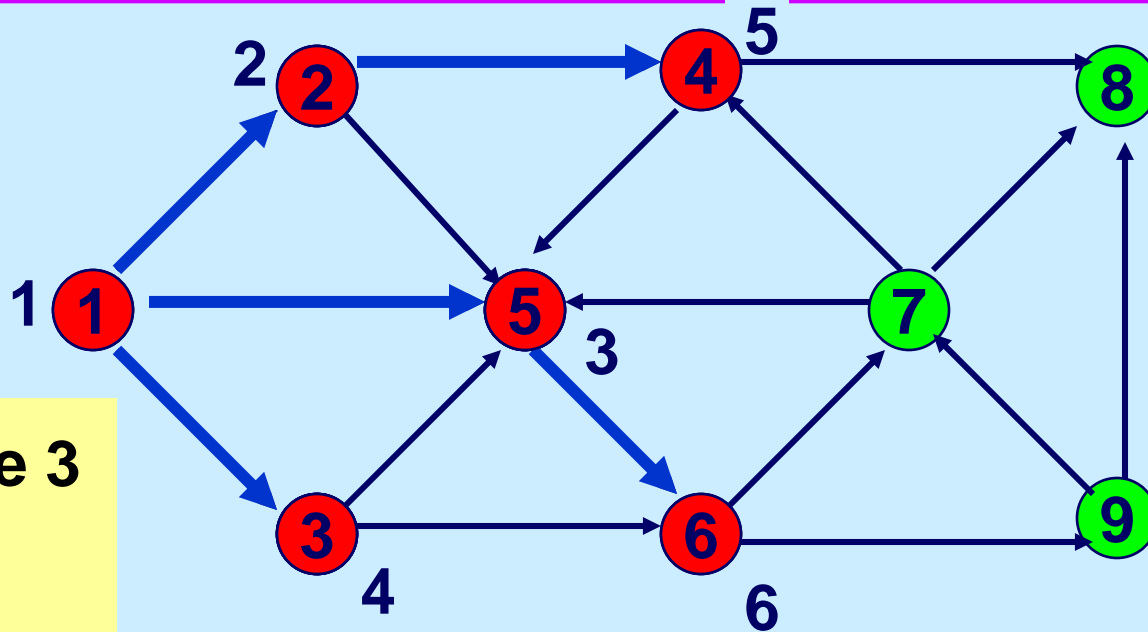


next

6

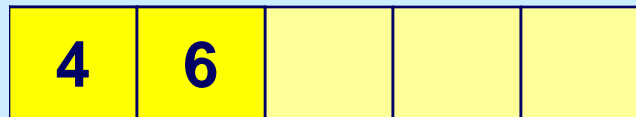
Breadth first search animation

Select node 3



delete node 3
from LIST

LIST

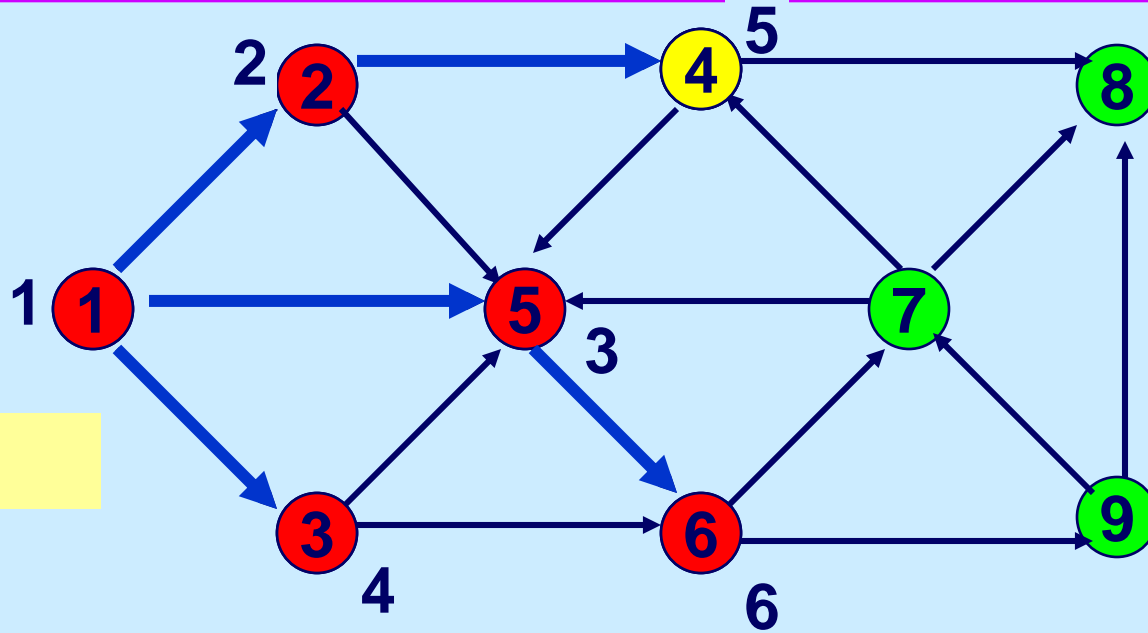


next

6

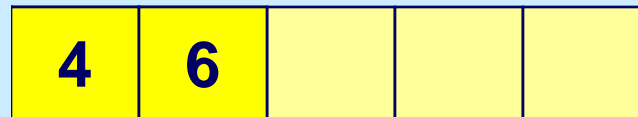
Breadth first search animation

Select a node



$i := 4$

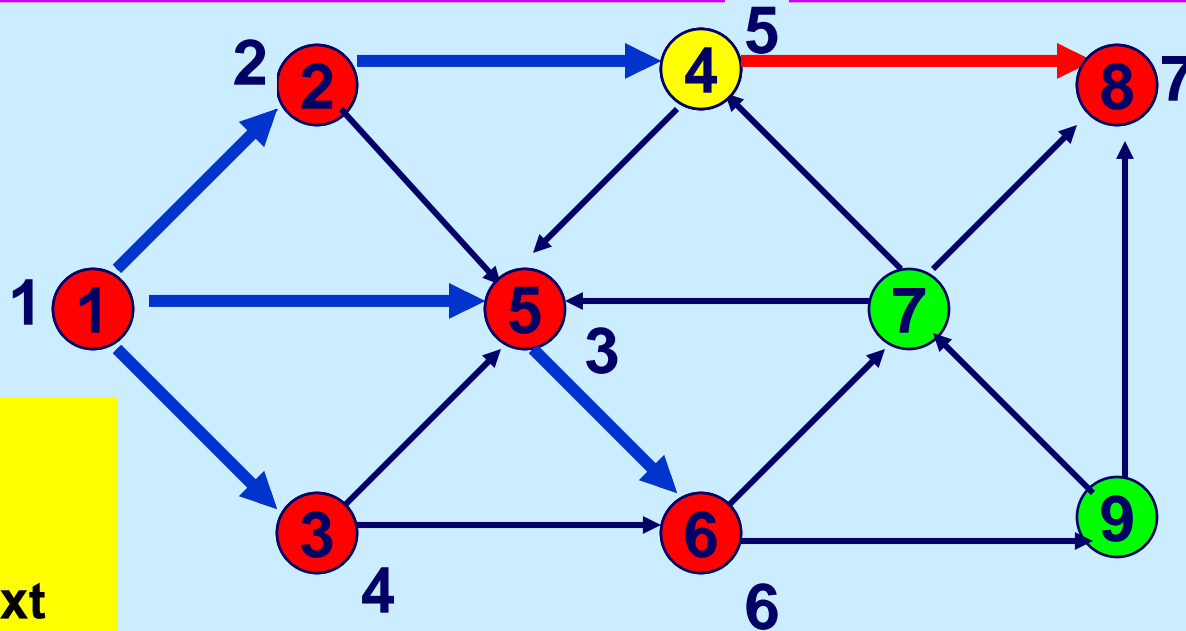
LIST



next 6

Breadth first search animation

If node i is incident to an admissible arc...



Next :=
Next + 1
order(j) := next
add j to LIST

LIST

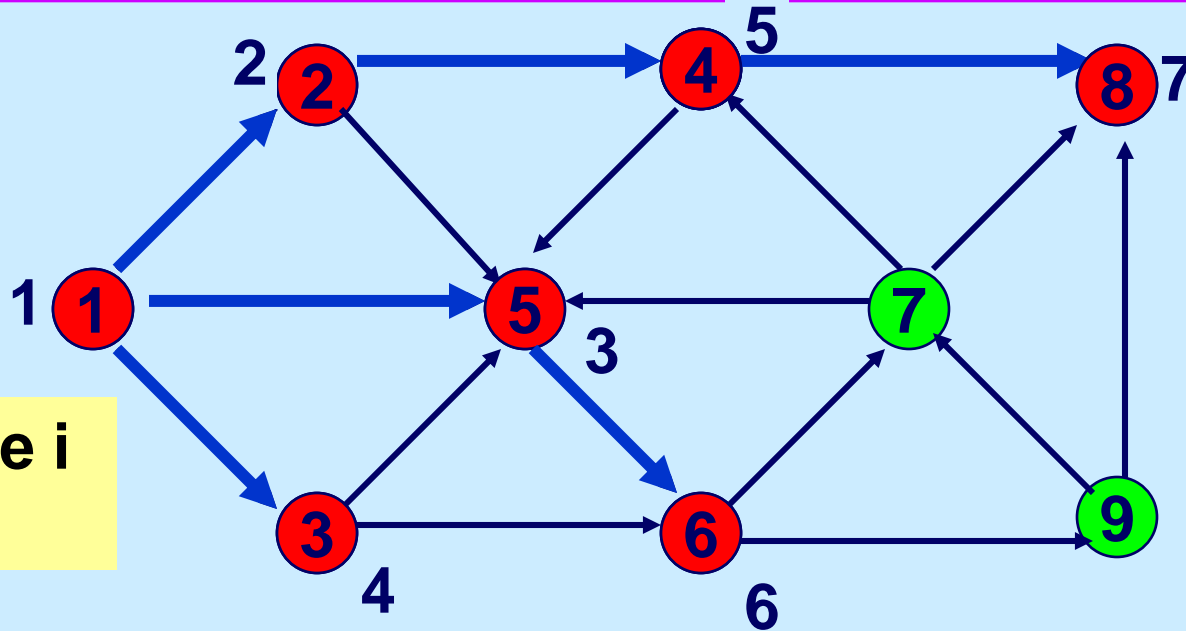


next

| |
|---|
| 7 |
|---|

Breadth first search animation

If node i is not incident to an admissible arc...



LIST

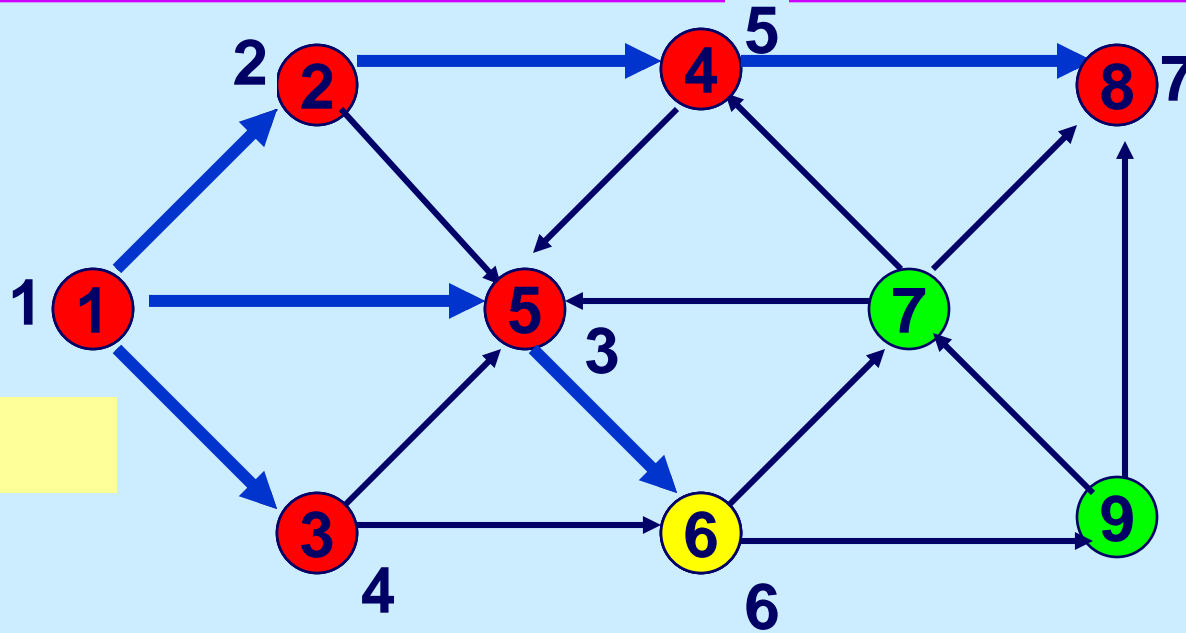


next



Breadth first search animation

Select node i



i := 6

LIST

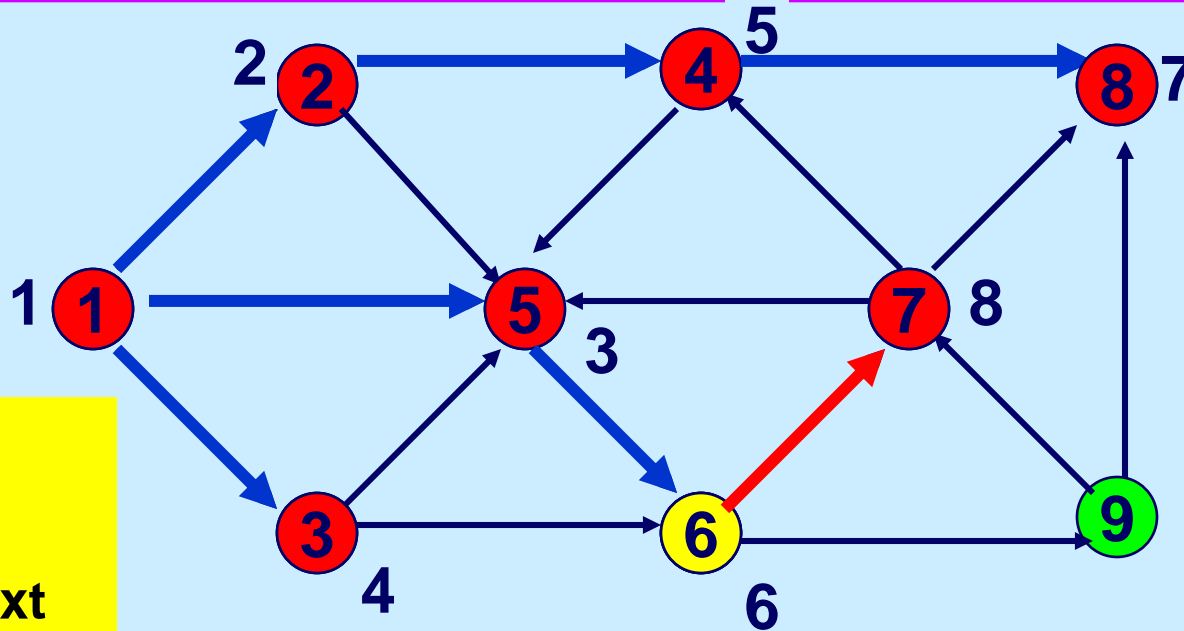


next

7

Breadth first search animation

If node i is incident to an admissible arc...



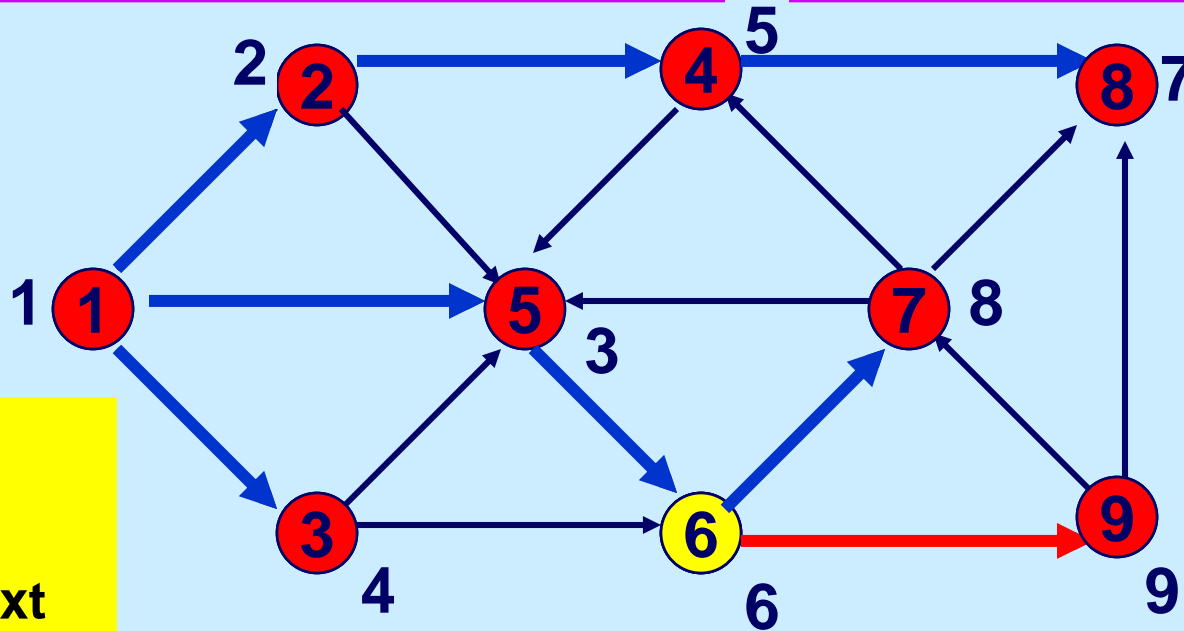
Next :=
Next + 1
order(j) := next
add j to LIST

LIST



Breadth first search animation

If node i is incident to an admissible arc...



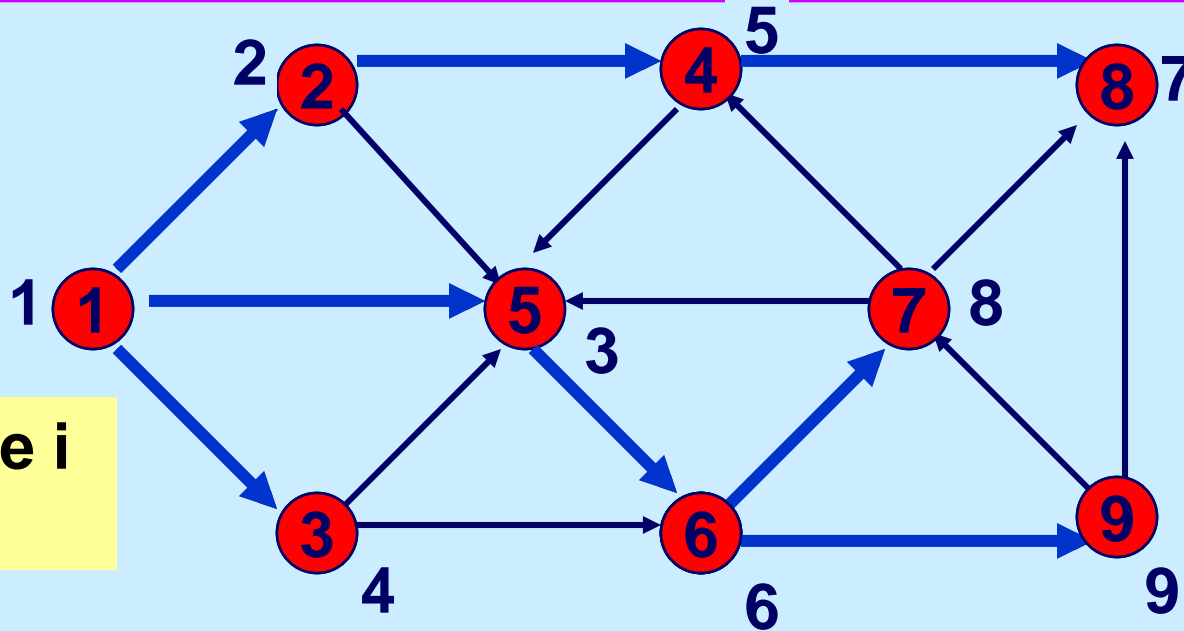
Next :=
Next + 1
order(j) := next
add j to LIST

LIST



Breadth first search animation

If node i is not incident to an admissible arc...



Delete node i
from LIST

LIST

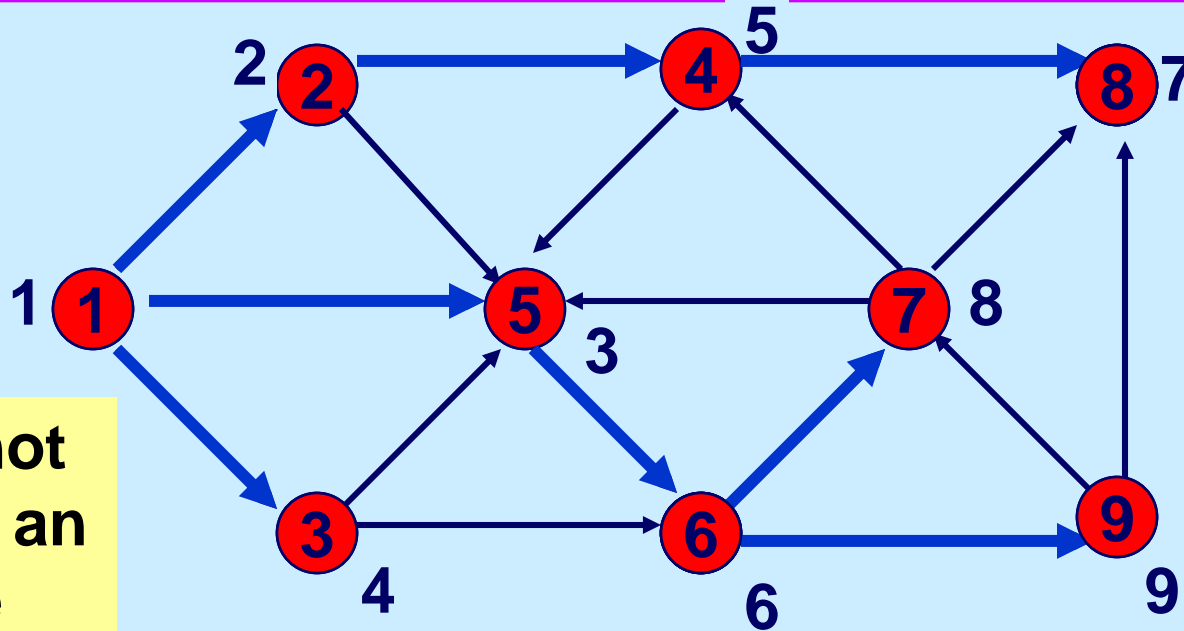


next



Breadth first search animation

Select node 8



node 8 is not incident to an admissible arc; delete it from LIST

LIST

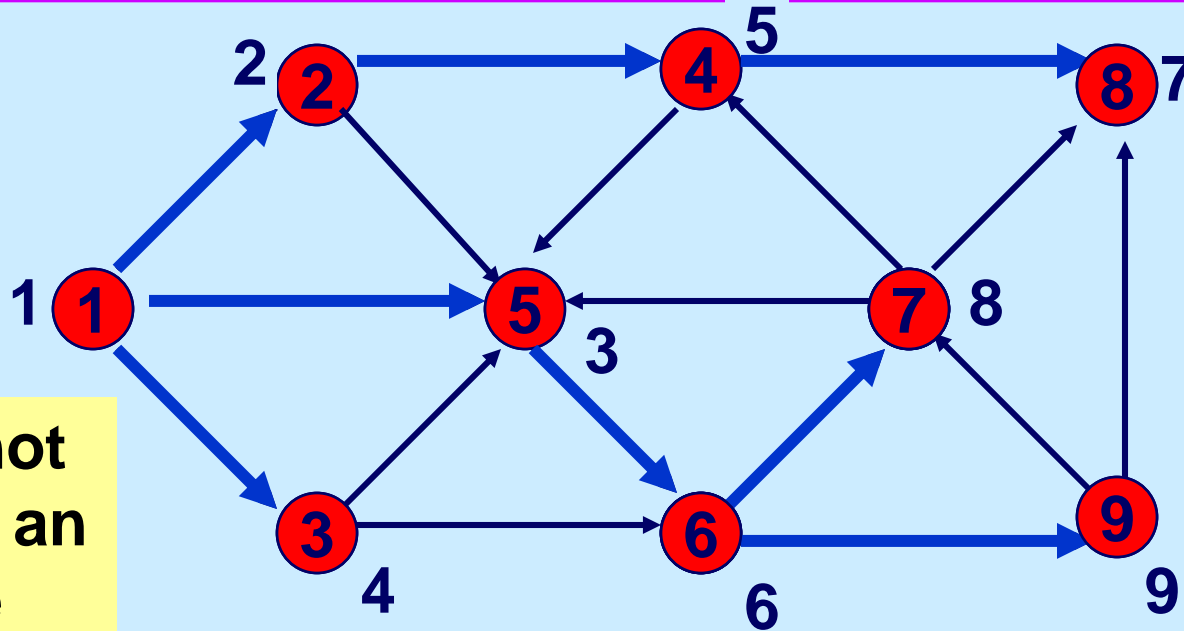


next

| |
|---|
| 9 |
|---|

Breadth first search animation

Select node 7



node 7 is not incident to an admissible arc; delete it from LIST

LIST

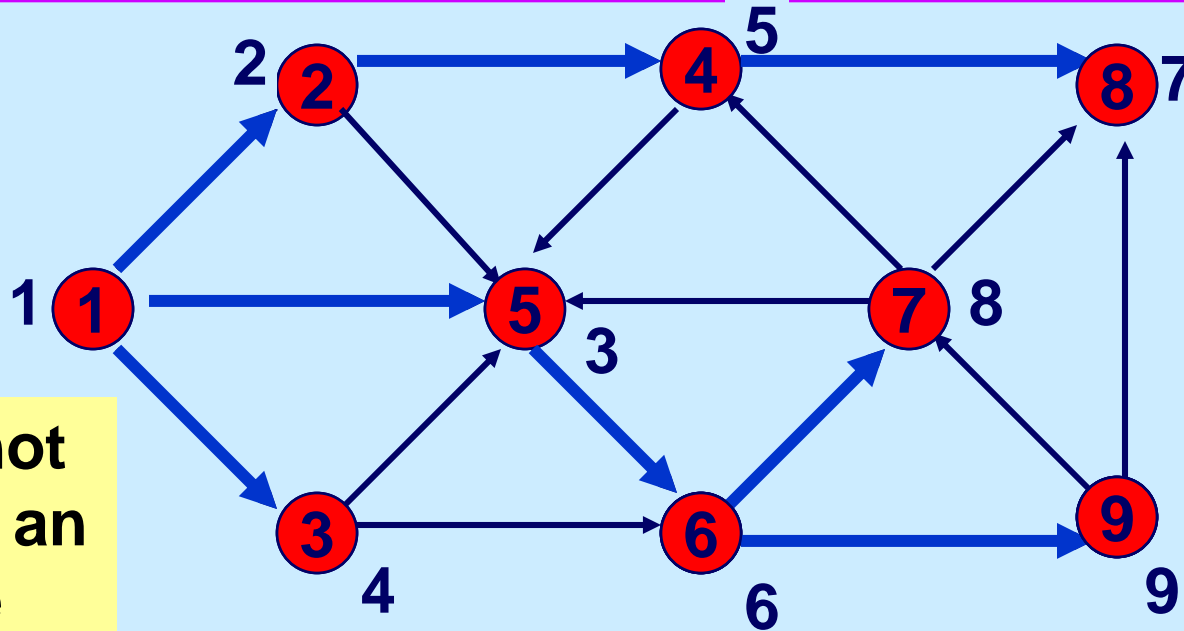
9

next

9

Breadth first search animation

Select node 9



node 9 is not incident to an admissible arc; delete it from LIST

LIST

next 9

Breadth first search animation

THE END
