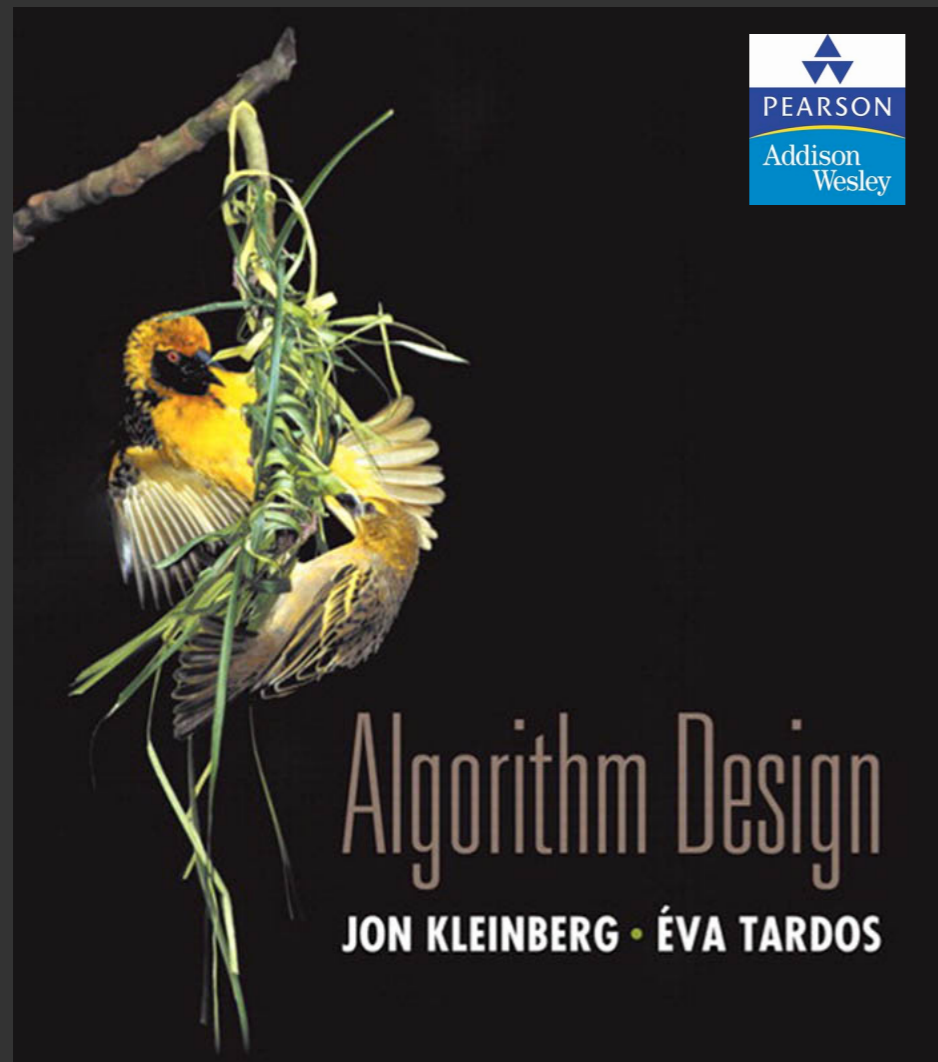


# INTRACTABILITY III

---

- ▶ *greedy independent set algorithm demo*



Lecture slides by Kevin Wayne

Copyright © 2005 Pearson–Addison Wesley

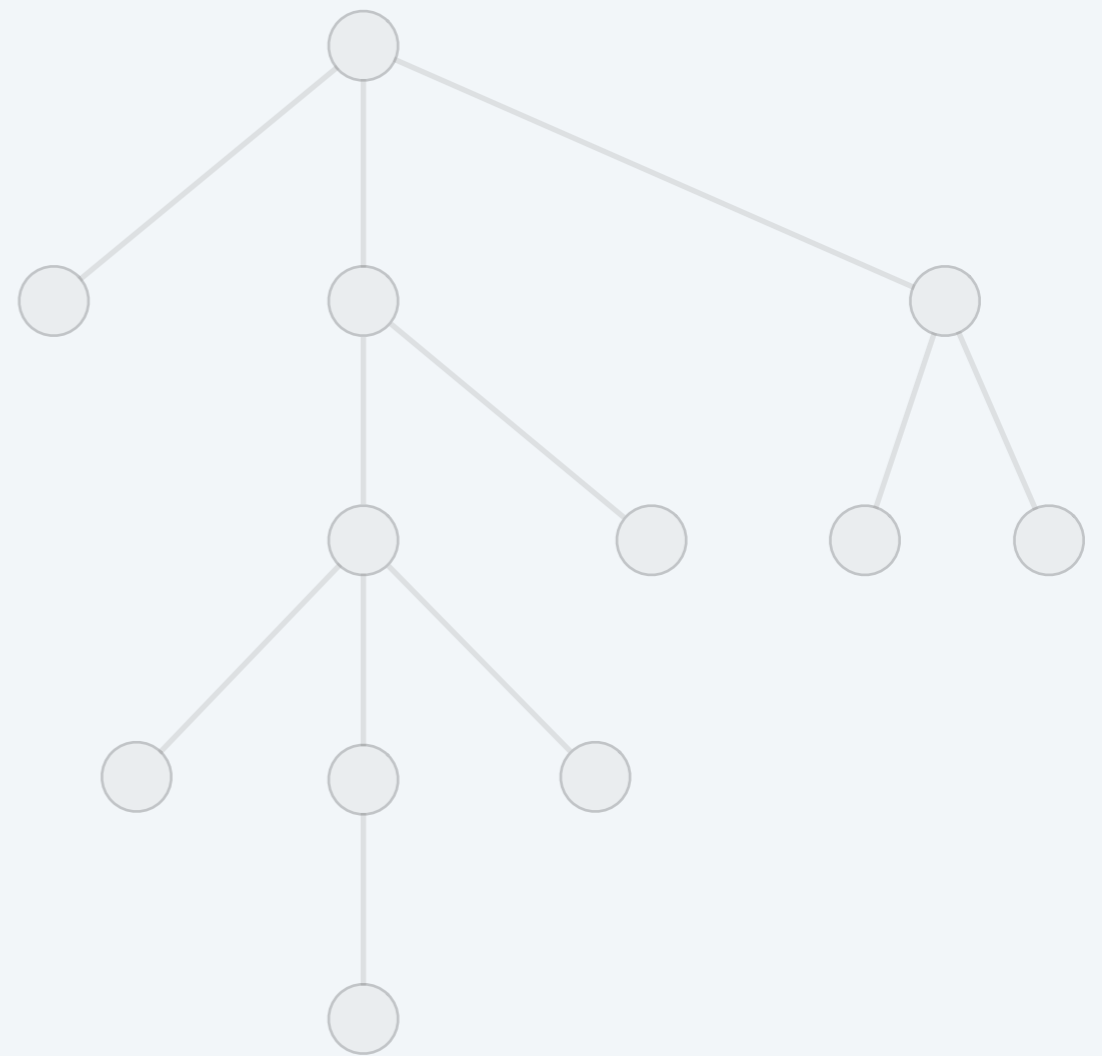
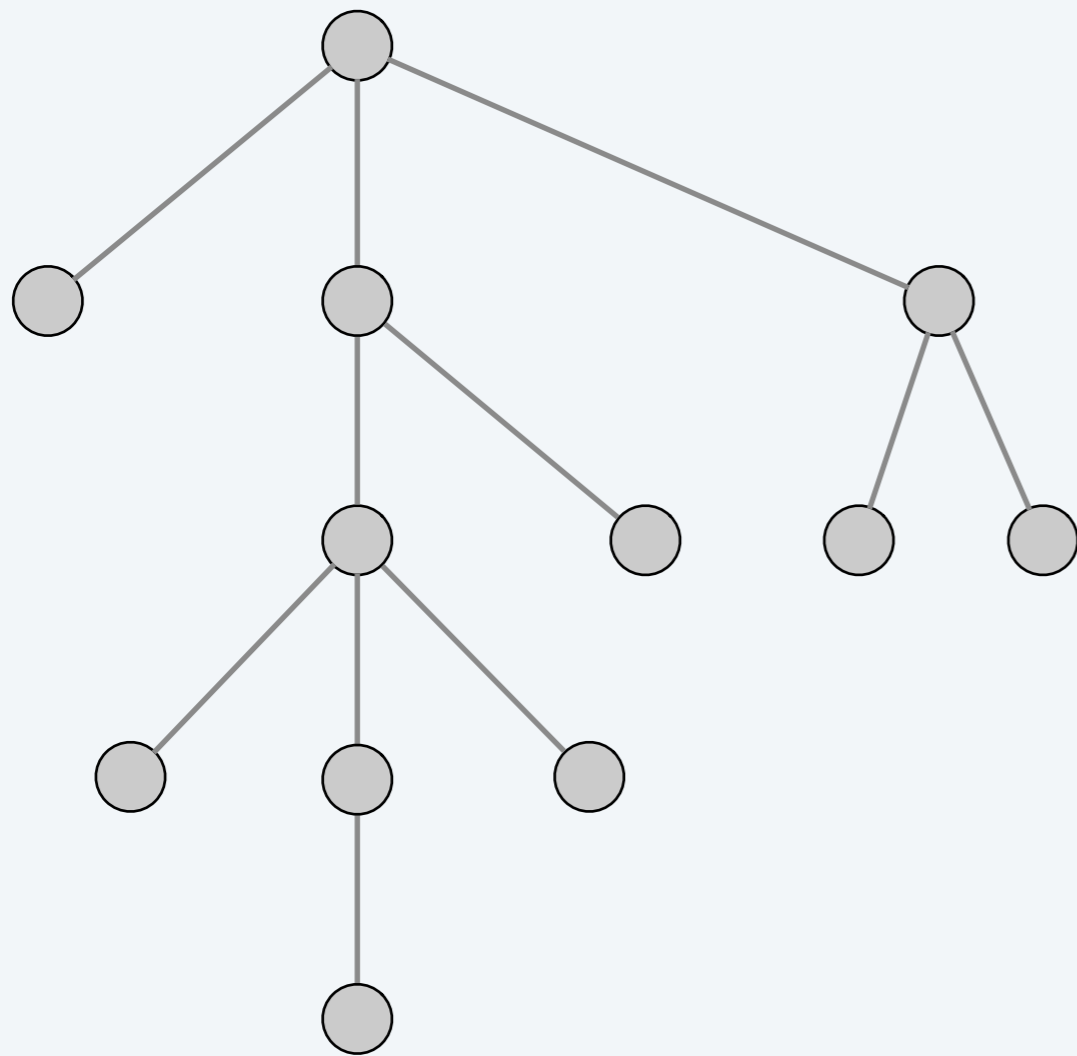
<http://www.cs.princeton.edu/~wayne/kleinberg-tardos>

# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).

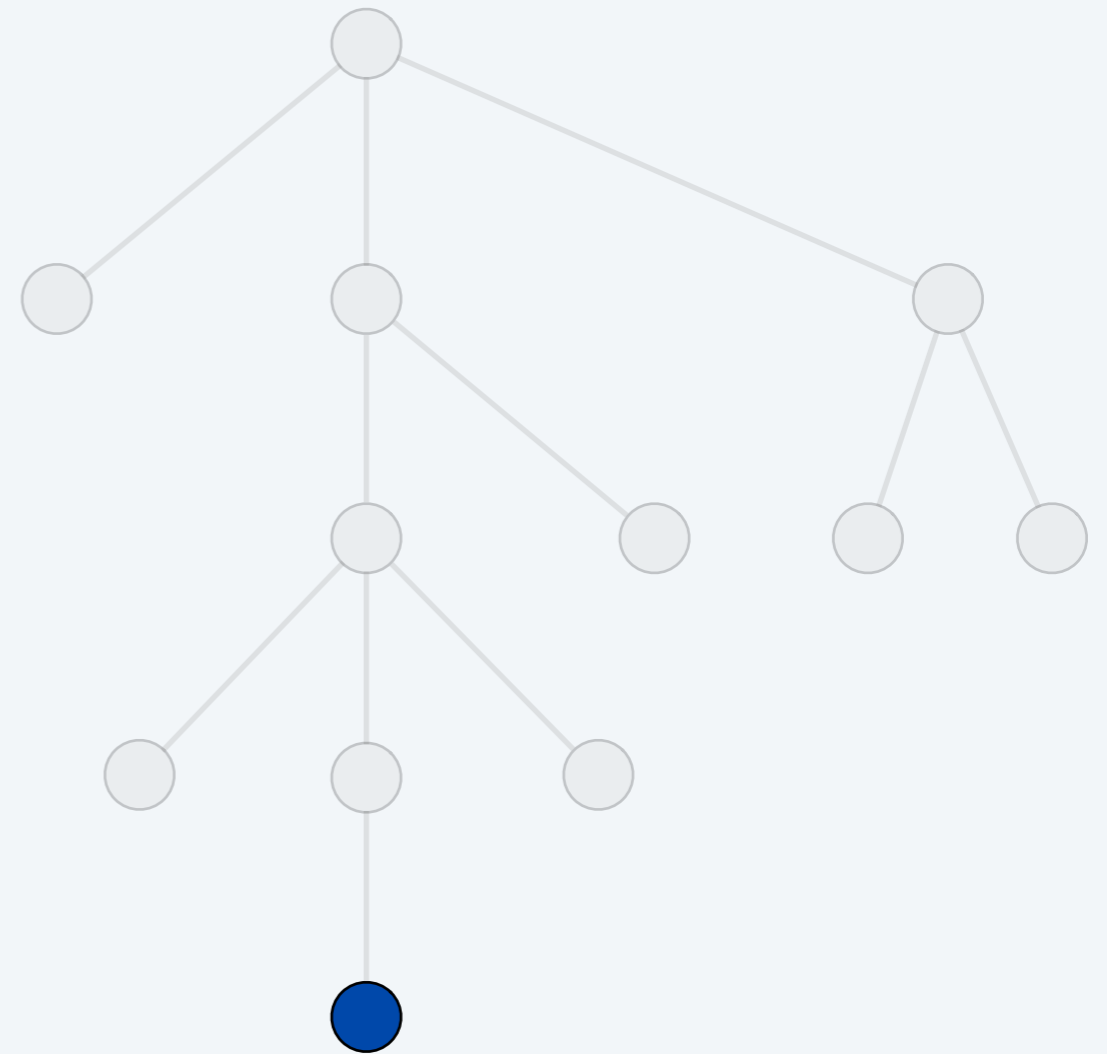
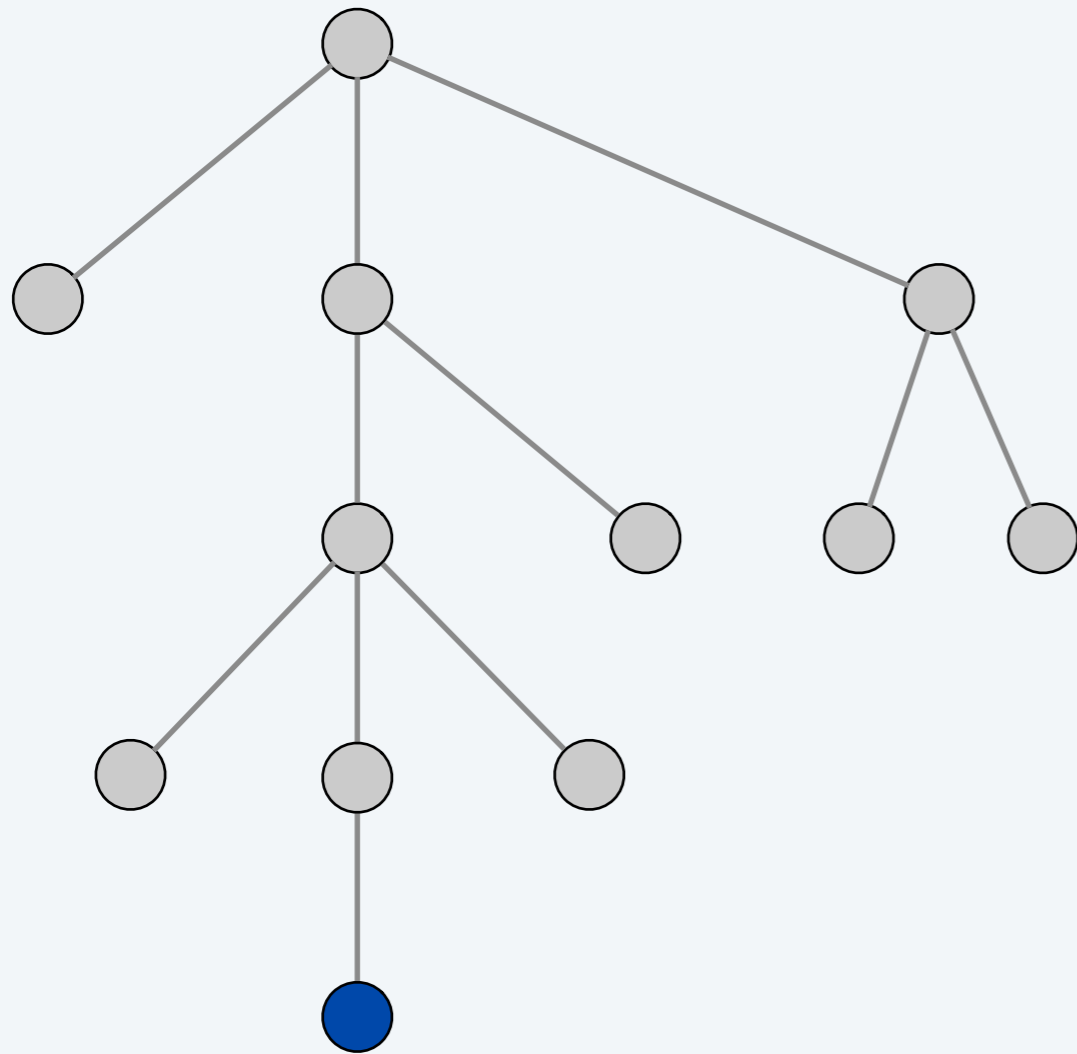


# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).

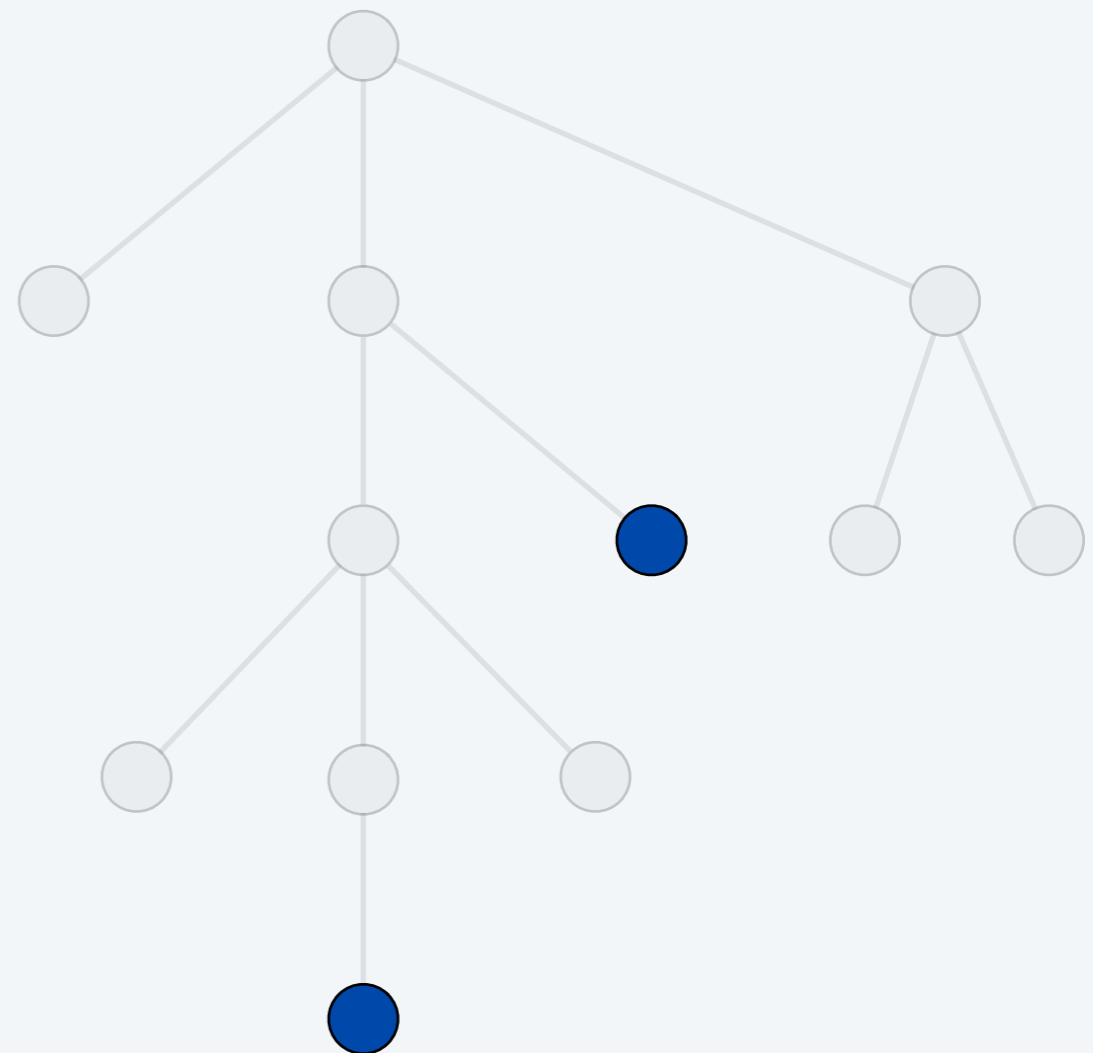
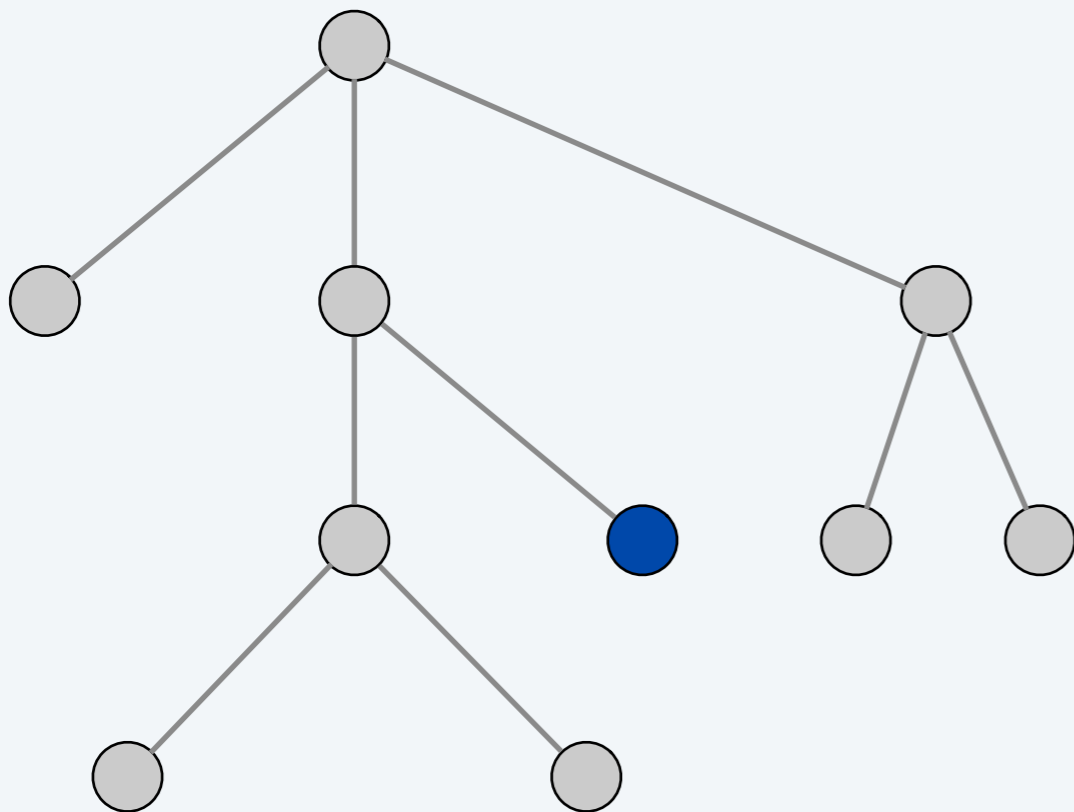


# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).

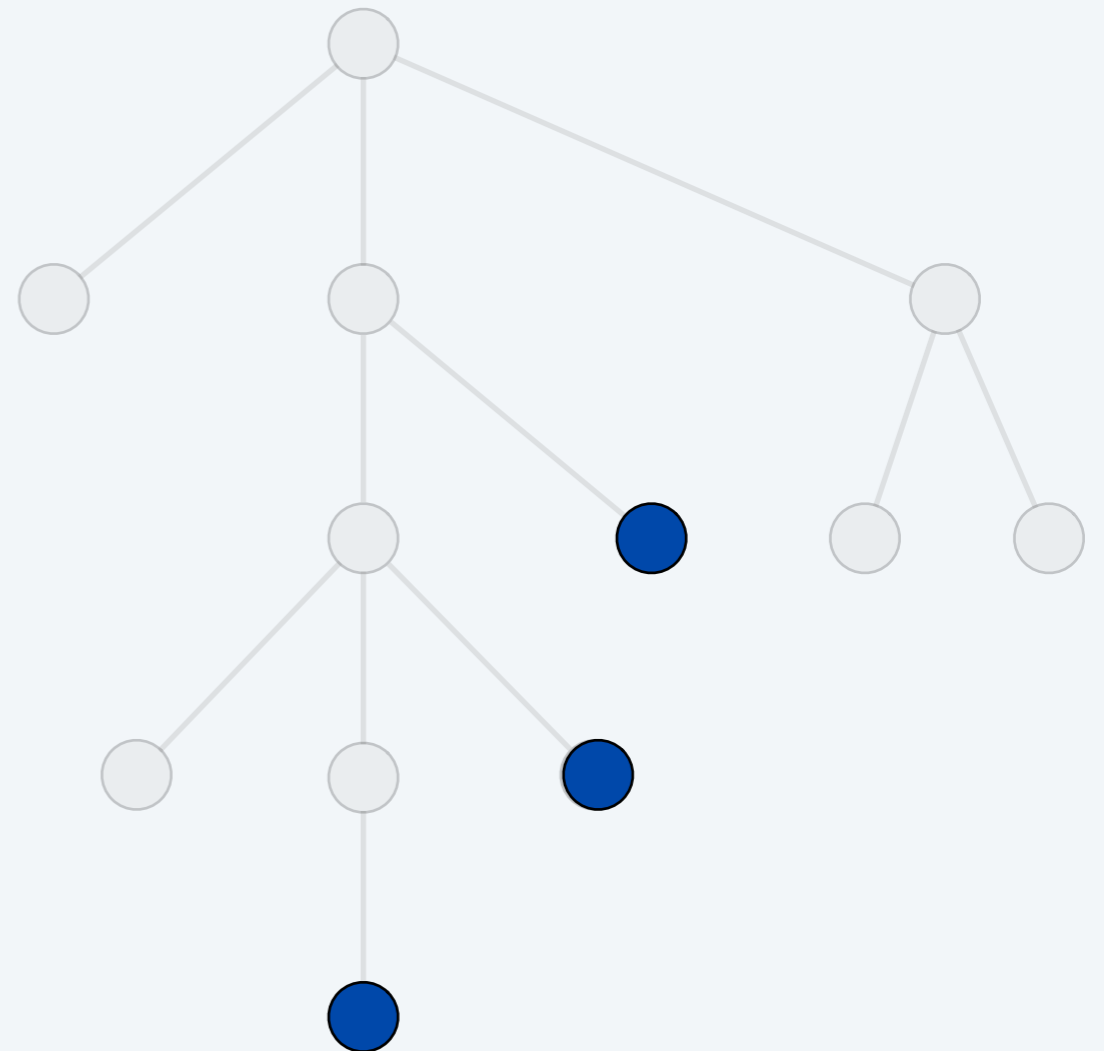
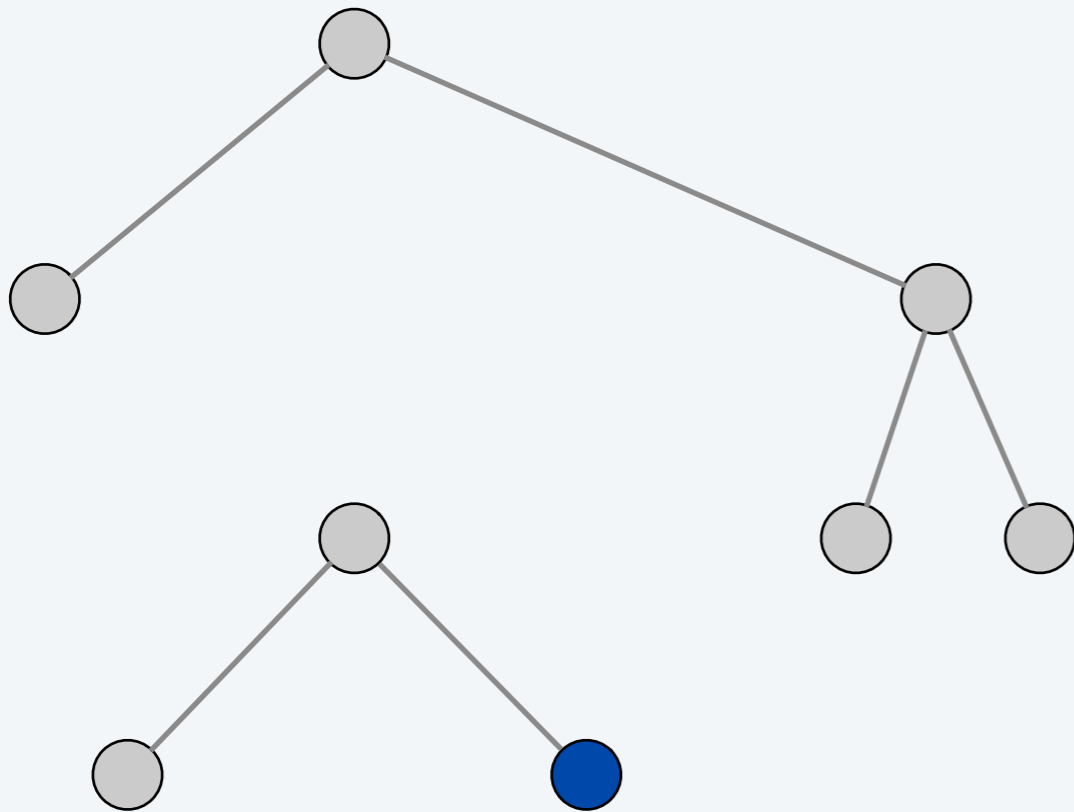


# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).

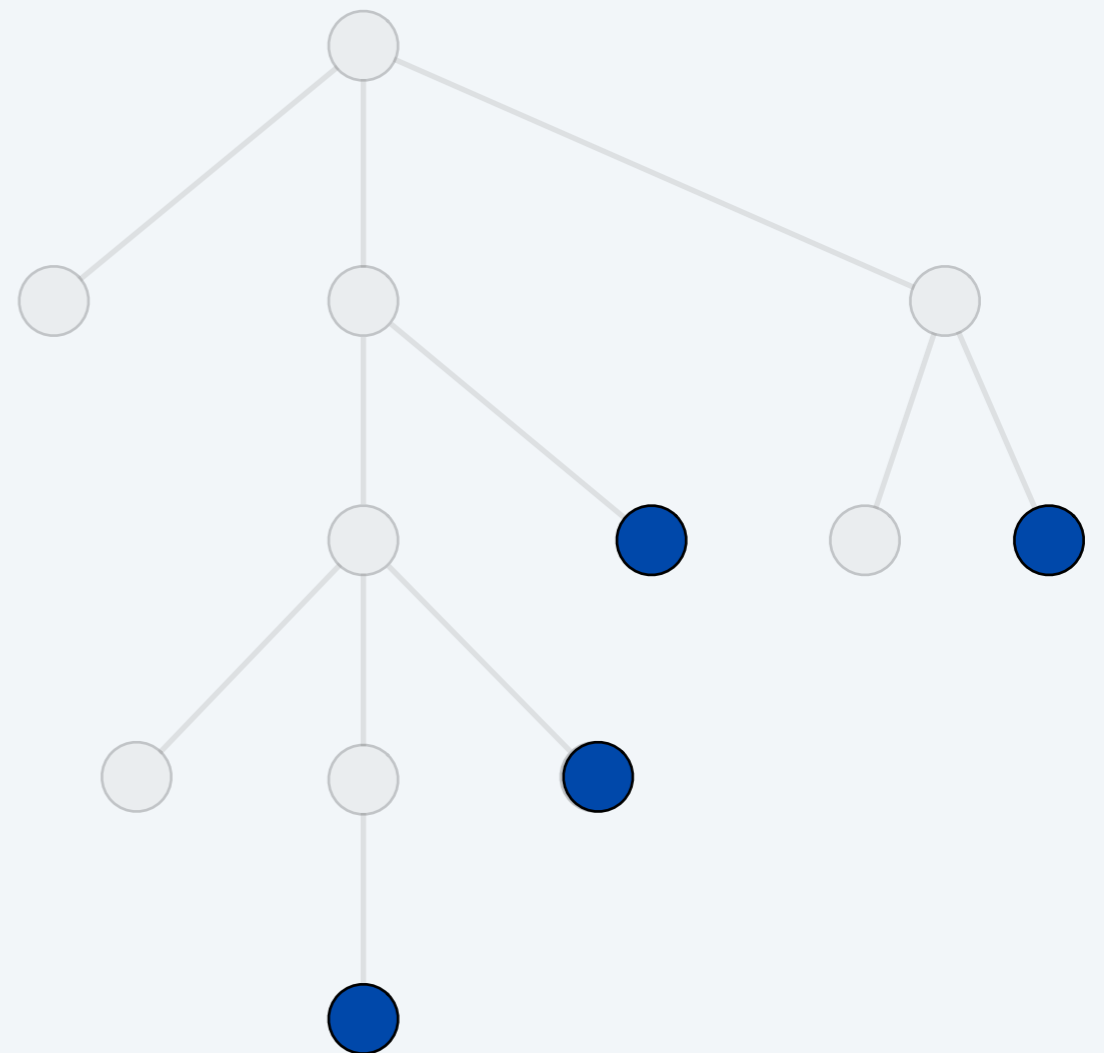
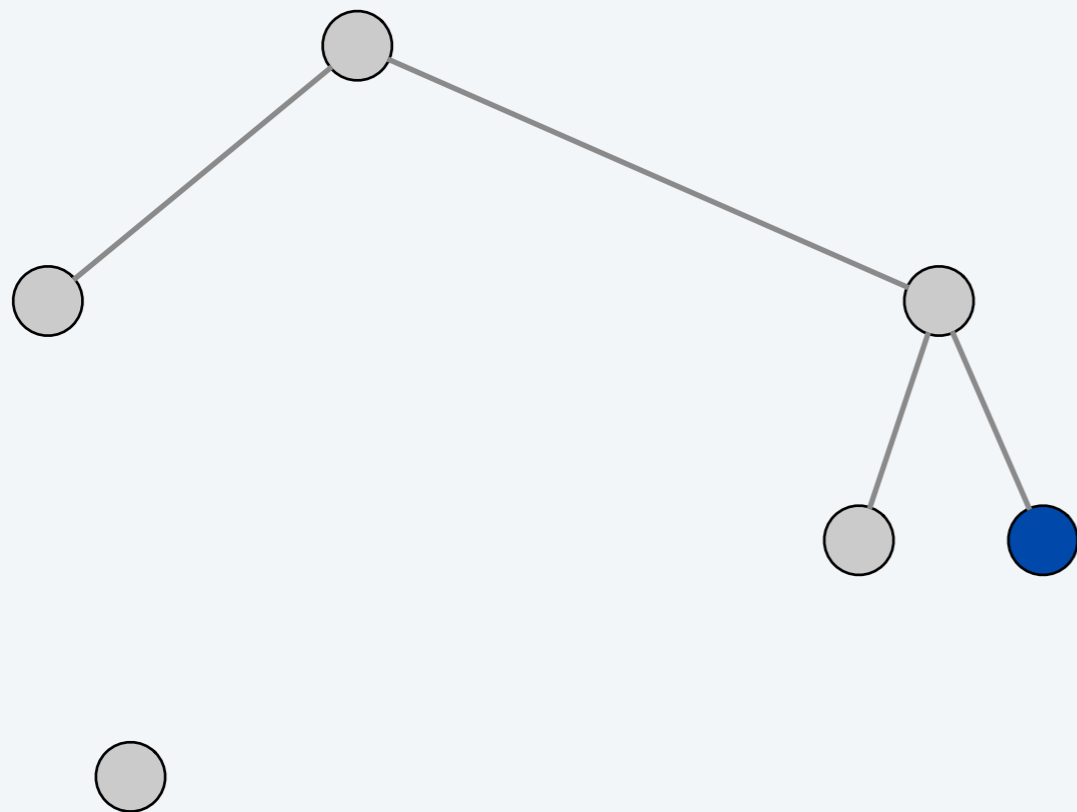


# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).

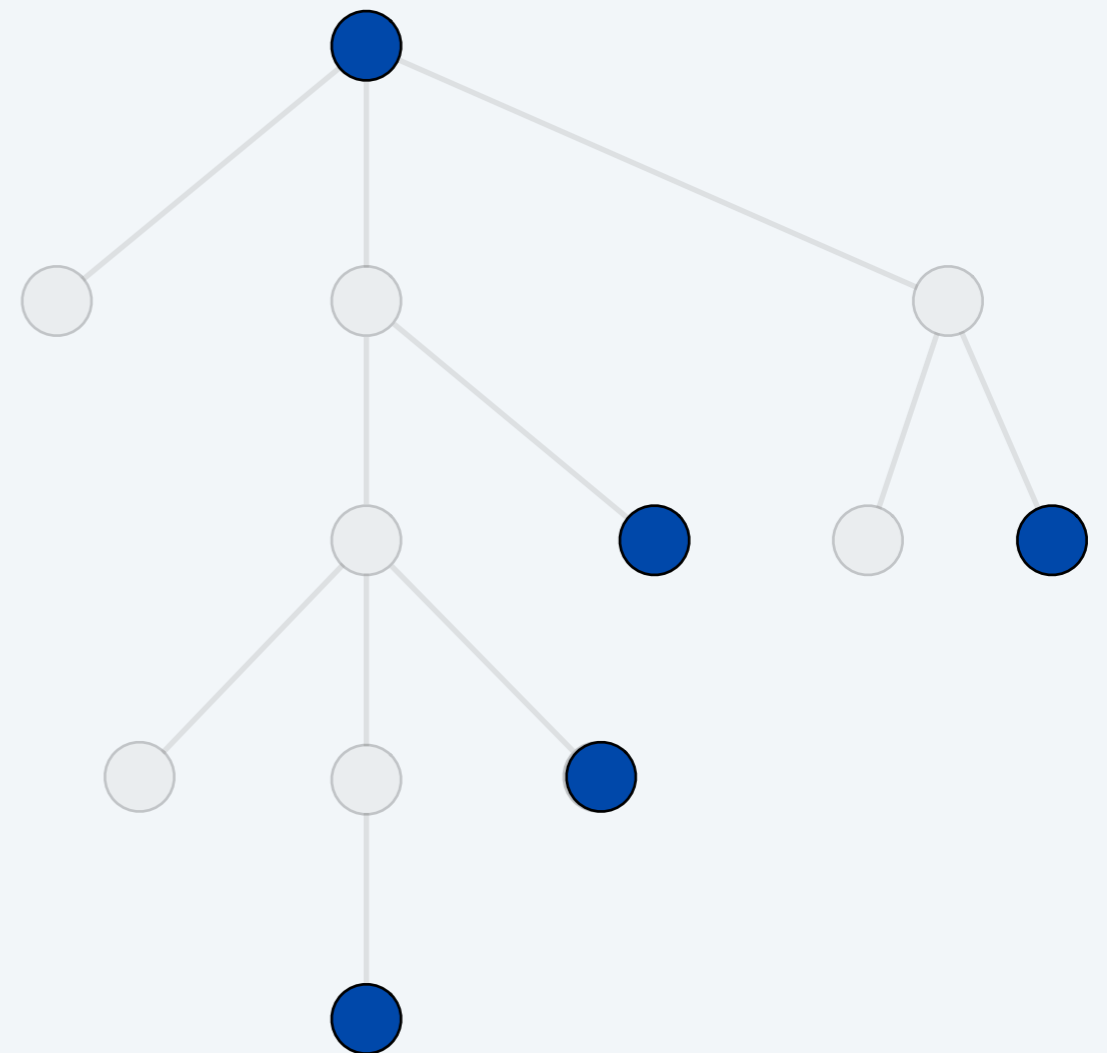
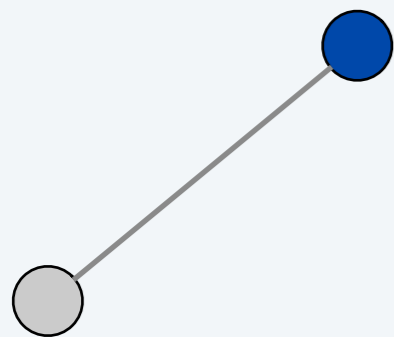


# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).



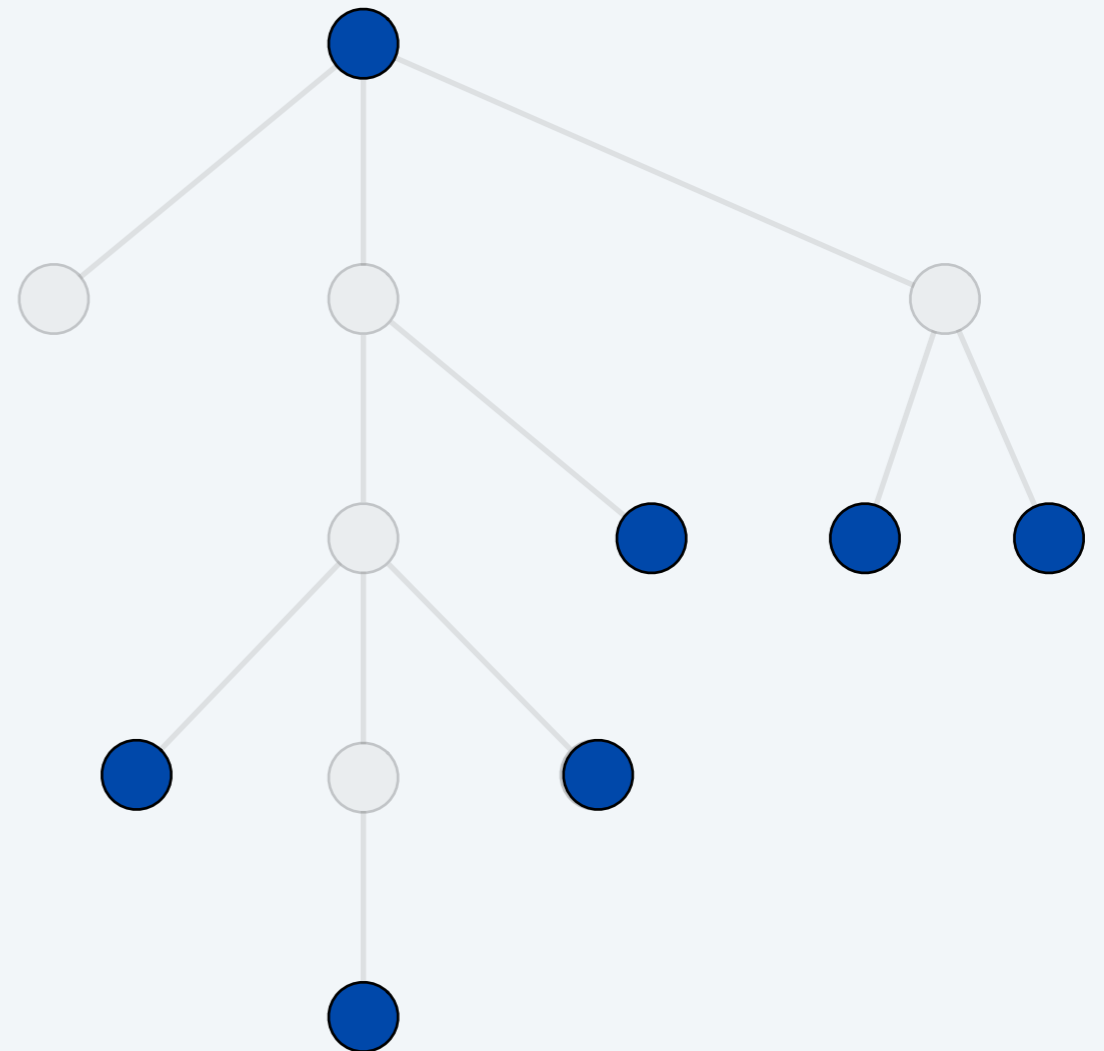
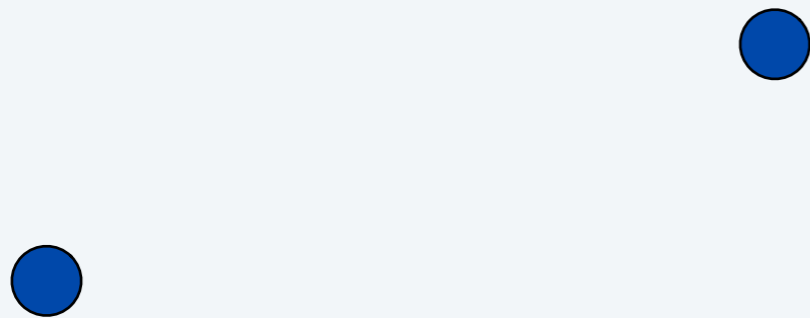
# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).

Add isolated nodes to independent set.



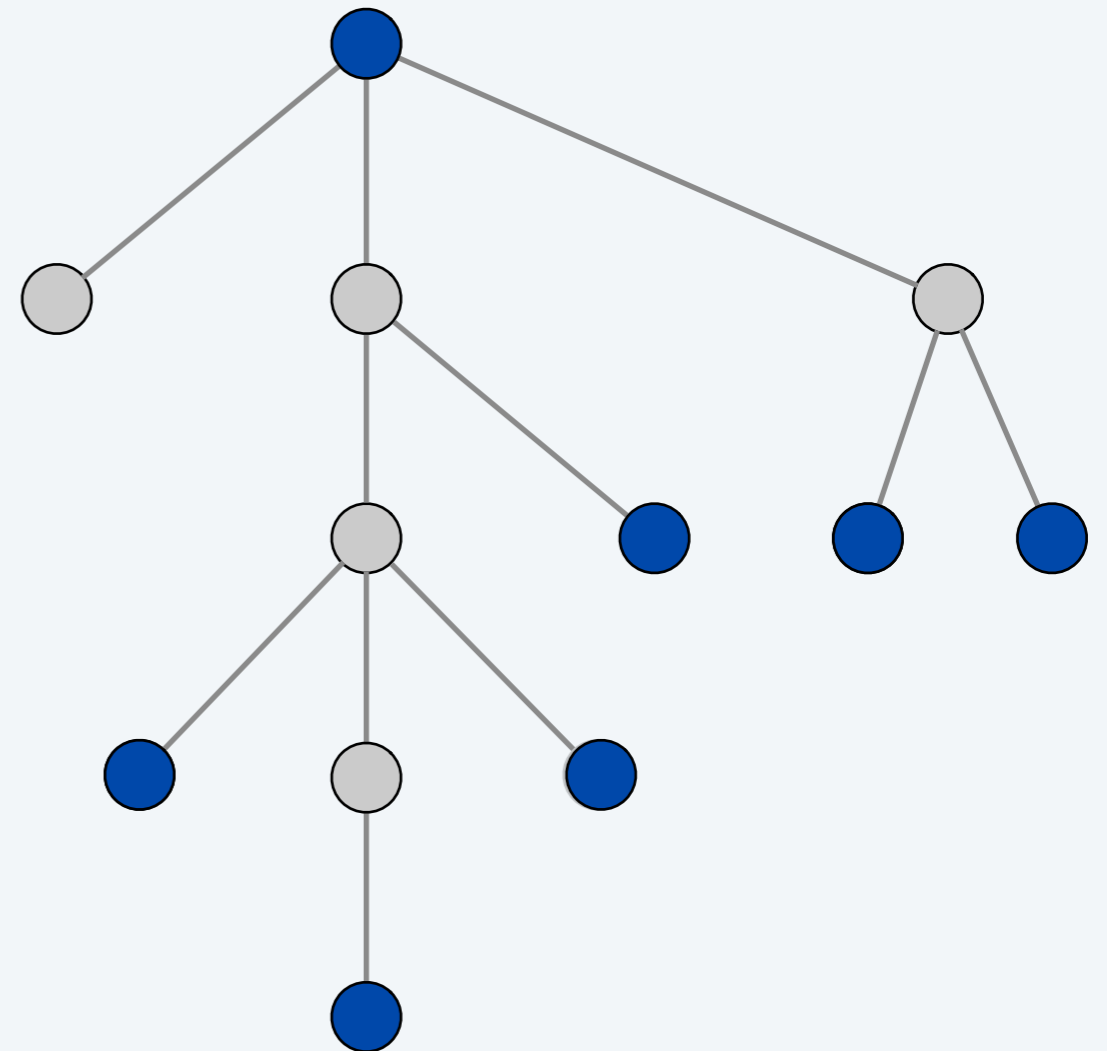


# Greedy independent set algorithm (for trees)

---

Repeatedly pick a leaf node  $v$ .

- Let  $(u, v)$  denote the incident edge.
- Add both  $v$  to the independent set.
- Delete  $u$  and  $v$  (and all incident edges).



**max-cardinality independent set**