4. Greedy Algorithms

- Red-rule blue-rule algorithm demo
Greedy algorithm demo

**Red rule.** Let $C$ be a cycle with no red edges. Select an uncolored edge of $C$ of max weight and color it red.

**Blue rule.** Let $D$ be a cutset with no blue edges. Select an uncolored edge in $D$ of min weight and color it blue.
Greedy algorithm demo

**Red rule.** Let $C$ be a cycle with no red edges. Select an uncolored edge of $C$ of max weight and color it red.

apply the red rule to the cycle
Greedy algorithm demo

current set of red and blue edges
Greedy algorithm demo

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**Red rule.** Let $C$ be a cycle with no red edges. Select an uncolored edge of $C$ of max weight and color it red.
Greedy algorithm demo

**Blue rule.** Let $D$ be a cutset with no blue edges. Select an uncolored edge in $D$ of min weight and color it blue.

apply the blue rule to the cutset
Greedy algorithm demo

current set of red and blue edges
**Greedy algorithm demo**

**Blue rule.** Let $D$ be a cutset with no blue edges. Select an uncolored edge in $D$ of min weight and color it blue.

![Diagram](image)

*apply the blue rule to the cutset*
Greedy algorithm demo

current set of red and blue edges
Greedy algorithm demo

apply the red rule to the cycle
Greedy algorithm demo

current set of red and blue edges
Blue rule. Let $D$ be a cutset with no blue edges. Select an uncolored edge in $D$ of min weight and color it blue.

apply the blue rule to the cutset
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current set of red and blue edges
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current set of red and blue edges
**Greedy algorithm demo**

**Blue rule.** Let $D$ be a cutset with no blue edges. Select an uncolored edge in $D$ of min weight and color it blue.

apply the blue rule to the cutset
Greedy algorithm demo

current set of red and blue edges
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apply the red rule to the cycle
Greedy algorithm demo

*current set of red and blue edges*
Greedy algorithm demo

Greedy algorithm. Upon termination, the blue edges form a MST.

a minimum spanning tree