4.3 Greedy MST Demo
• Start with all edges colored gray.
• Find cut with no black crossing edges; color its min-weight edge black.
• Repeat until $V-1$ edges are colored black.

an edge-weighted graph

<table>
<thead>
<tr>
<th>Edge</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7</td>
<td>0.16</td>
</tr>
<tr>
<td>2-3</td>
<td>0.17</td>
</tr>
<tr>
<td>1-7</td>
<td>0.19</td>
</tr>
<tr>
<td>0-2</td>
<td>0.26</td>
</tr>
<tr>
<td>5-7</td>
<td>0.28</td>
</tr>
<tr>
<td>1-3</td>
<td>0.29</td>
</tr>
<tr>
<td>1-5</td>
<td>0.32</td>
</tr>
<tr>
<td>2-7</td>
<td>0.34</td>
</tr>
<tr>
<td>4-5</td>
<td>0.35</td>
</tr>
<tr>
<td>1-2</td>
<td>0.36</td>
</tr>
<tr>
<td>4-7</td>
<td>0.37</td>
</tr>
<tr>
<td>0-4</td>
<td>0.38</td>
</tr>
<tr>
<td>6-2</td>
<td>0.40</td>
</tr>
<tr>
<td>3-6</td>
<td>0.52</td>
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<tr>
<td>6-0</td>
<td>0.58</td>
</tr>
<tr>
<td>6-4</td>
<td>0.93</td>
</tr>
</tbody>
</table>
Greedy MST algorithm demo

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- Repeat until $V - 1$ edges are colored black.
Greedy MST algorithm demo

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MST edges

0–2
Greedy MST algorithm demo

- Start with all edges colored gray.
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- Repeat until \( V - 1 \) edges are colored black.

![Graph with edges colored gray and one black edge](image)

**MST edges**

0–2

**Crossing edges (sorted by weight)**

- 5–7 0.28
- 1–5 0.32
- 4–5 0.35
Greedy MST algorithm demo

- Start with all edges colored gray.
- Find cut with no black crossing edges; color its min-weight edge black.
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MST edges

0–2  5–7
Greedy MST algorithm demo

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Greedy MST algorithm demo

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**MST edges**

0–2  5–7  6–2
Greedy MST algorithm demo

- Start with all edges colored gray.
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- Repeat until $V - 1$ edges are colored black.

MST edges

0–2  5–7  6–2
Greedy MST algorithm demo

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MST edges

0–2  5–7  6–2  0–7
Greedy MST algorithm demo

- Start with all edges colored gray.
- Find cut with no black crossing edges; color its min-weight edge black.
- Repeat until $V - 1$ edges are colored black.

MST edges:
0–2  5–7  6–2  0–7

crossing edges (sorted by weight):
in MST  2–3  0.17
       1–7  0.19
       1–5  0.32
       1–2  0.36
       3–6  0.52

min-weight crossing edge
Greedy MST algorithm demo

- Start with all edges colored gray.
- Find cut with no black crossing edges; color its min-weight edge black.
- Repeat until $V - 1$ edges are colored black.

MST edges

0–2  5–7  6–2  0–7  2–3
Greedy MST algorithm demo

- Start with all edges colored gray.
- Find cut with no black crossing edges; color its min-weight edge black.
- Repeat until $V-1$ edges are colored black.

MST edges

0-2  5-7  6-2  0-7  2-3
The Greedy MST algorithm demo involves the following steps:

- Start with all edges colored gray.
- Find a cut with no black crossing edges; color its min-weight edge black.
- Repeat until \( V - 1 \) edges are colored black.

The MST edges for the given graph are:

- 0-2
- 5-7
- 6-2
- 0-7
- 2-3
- 1-7
Start with all edges colored gray.
Find cut with no black crossing edges; color its min-weight edge black.
Repeat until $V - 1$ edges are colored black.

**MST edges**

0–2  5–7  6–2  0–7  2–3  1–7
Greedy MST algorithm demo

- Start with all edges colored gray.
- Find cut with no black crossing edges; color its min-weight edge black.
- Repeat until \( V - 1 \) edges are colored black.

**MST edges**

0–2  5–7  6–2  0–7  2–3  1–7  4–5