4.3 Greedy Algorithm Demo
Greedy MST algorithm

• Start with all edges colored gray.
• Find a cut with no black crossing edges, and color its min-weight edge black.
• Continue 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>
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<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>
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**MST edges**

0-2
Greedy MST algorithm

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MST edges

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MST edges

0–2  5–7
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![MST edges](image)

**MST edges**

0–2   5–7   6–2
Greedy MST algorithm

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**MST edges**

- 0-2
- 5-7
- 6-2

**Crossing edges (sorted by weight)**

- 0-7 0.16
- 2-3 0.17
- 2-7 0.34
- 4-5 0.35
- 1-2 0.36
- 4-7 0.37
- 3-6 0.52

**MST edges**

- 0-2
- 5-7
- 6-2
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**MST edges**

0–2 5–7 6–2 0–7
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MST edges

$0-2$  $5-7$  $6-2$  $0-7$
**Greedy MST algorithm**

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![MST edges](image)

**MST edges**

0–2  5–7  6–2  0–7  2–3
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MST edges

0-2  5-7  6-2  0-7  2-3

Crossing edges (sorted by weight)

in MST

1-7  0.19
1-3  0.29
1-5  0.32
4-5  0.35
1-2  0.36
4-7  0.37
0-4  0.38
6-4  0.93
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MST edges

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- 5–7
- 6–2
- 0–7
- 2–3
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MST edges

0-2 5-7 6-2 0-7 2-3 1-7
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MST edges

0–2  5–7  6–2  0–7  2–3  1–7  4–5