4.3 Greedy MST Demo
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.

![An edge-weighted graph](image)

<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>
</tr>
<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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Diagram:
- Grey vertices form one side of cut
- Min-weight crossing edge
- Crossing edges (sorted by weight)
  - in MST
    - 0–2 0.26
    - 1–3 0.29
    - 2–7 0.34
    - 1–2 0.36
    - 6–0 0.58
    - 6–4 0.93
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**MST edges**

- 0–2

**Crossing edges (sorted by weight)**

- 5–7 0.28
- 1–5 0.32
- 4–5 0.35
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**MST edges**

0–2  5–7
Greedy MST algorithm demo

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MST edges

0–2  5–7
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MST edges

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

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MST edges
0–2  5–7  6–2

Crossing edges
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

Min-weight crossing edge
Greedy MST algorithm demo

- Start with all edges colored gray.
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MST edges

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

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**MST edges**

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

**Crossing edges (sorted by weight)**

- 2-3 0.17
- 1-7 0.19
- 1-5 0.32
- 1-2 0.36
- 3-6 0.52
Greedy MST algorithm demo

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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
Greedy MST algorithm demo

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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
```
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MST edges

0–2  5–7  6–2  0–7  2–3  1–7  4–5