Bölüm 12: Açgözlü Algoritmalar

Algoritmalar

Adım Adım Kazananlar

- Açgözlü algoritmalar, her adımda en iyi görünen seçeneği seçerek ilerler.
- Tıpkı bir define arayan gibi,
  - her aşamada en fazla kazancı sağlayacak seçeneği tercih eder.

Açgözlü Algoritmalar

- Açgözlü algoritmaları, basamaklı bir yaklaşıma benzer.
- Her adımda, mevcut durum için en iyi sonucu verecek seçenek seçilir.
- Tıpkı bir yolculuk planlarken en kısa yolu seçmek gibi..
- Problemi bütün olarak ele almaz, mevcut en iyi seçeneğe odaklanır.
- Karmaşık problemleri çözmek için hızlı ve basit bir yöntem sunar.
- Kod yapısı genellikle basit ve anlaşılması kolaydır.
- En iyi (optimal) çözümü bulmayı garanti etmez.
- Çoğu durumda iyi bir yaklaşım üretir.

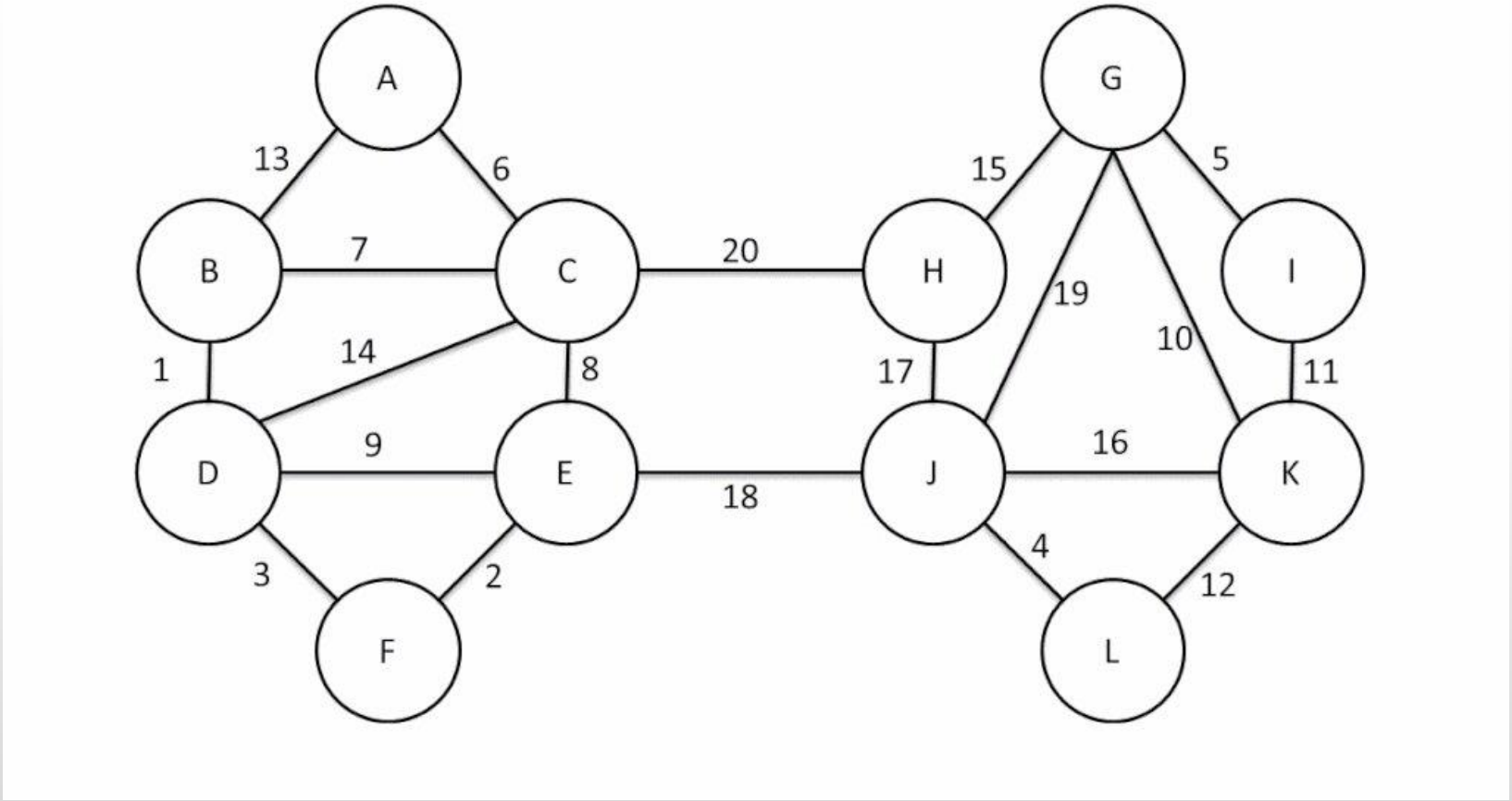
Borůvka'nın Algoritması

- Çizge teorisinde kullanılan bir en küçük ağaç bulma algoritmasıdır.
- Başlangıçta her bir düğüm bir alt ağaç oluşturur.
- Her adımda,
  - her alt ağacın en az maliyetli kenarı bulunur ve
  - bu kenarlar birleştirilerek yeni bir ağaç oluşturulur.
- Greedy (açgözlü): Her adımda yerel olarak en iyi seçeneği seçer.
- Her adımda en az bir kenar seçilir ve ağaç büyütülür.
- Çalışma zamanı: O(E log V), E kenar sayısı, V düğüm sayısı.

Borůvka'nın Algoritması

- Adım 1: Her düğüm bir alt ağaç olarak başlar.
- Adım 2: Her alt ağaçtan, en az maliyetli kenarı içeren kenar seçilir.
- Adım 3: Seçilen kenarlarla alt ağaçlar birleştirilir.
- Adım 4: Aynı süreç, alt ağaçlar tek bir ağaçta toplanana kadar tekrarlanır.

Borůvka's Algorithm



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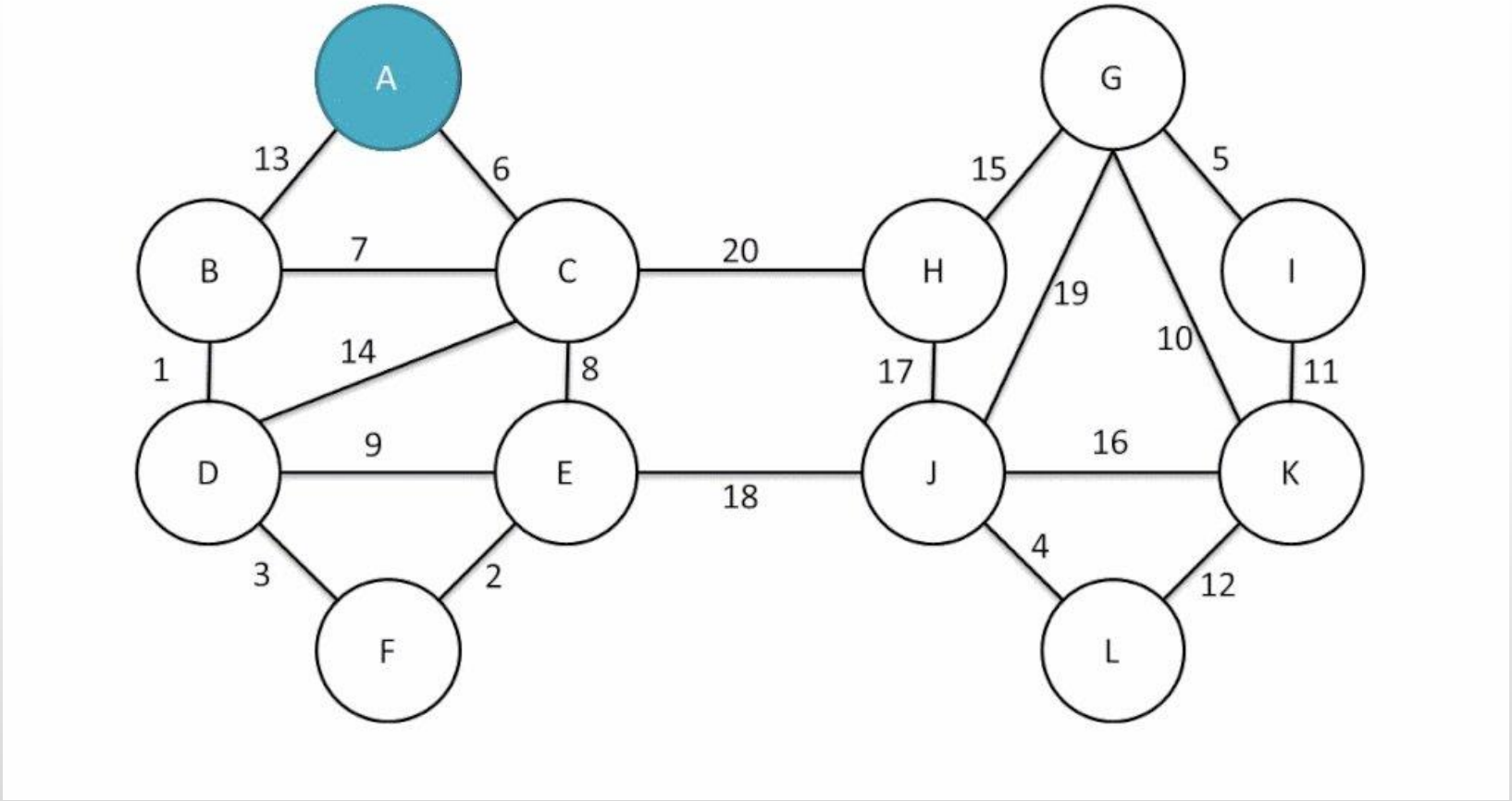

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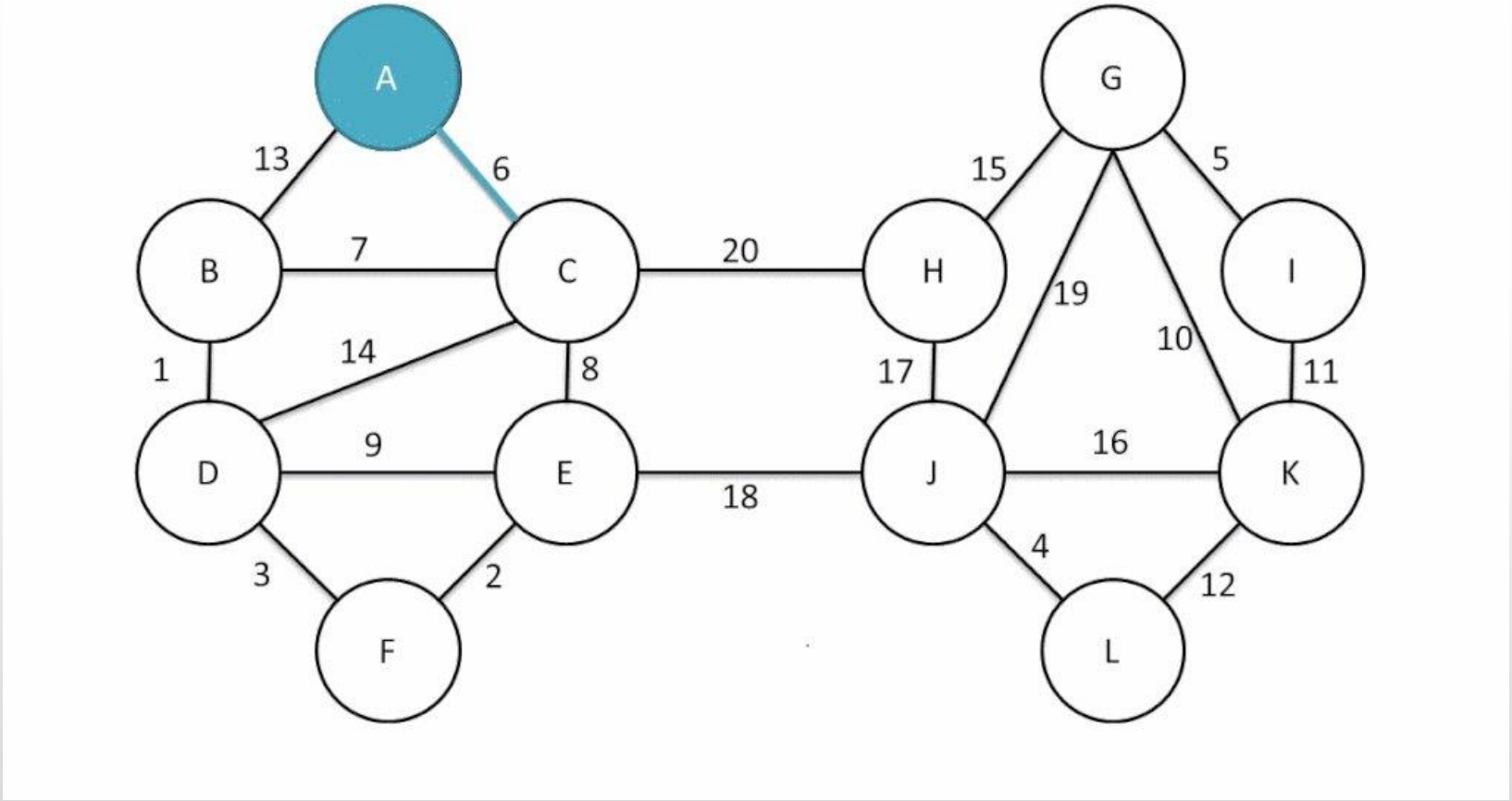

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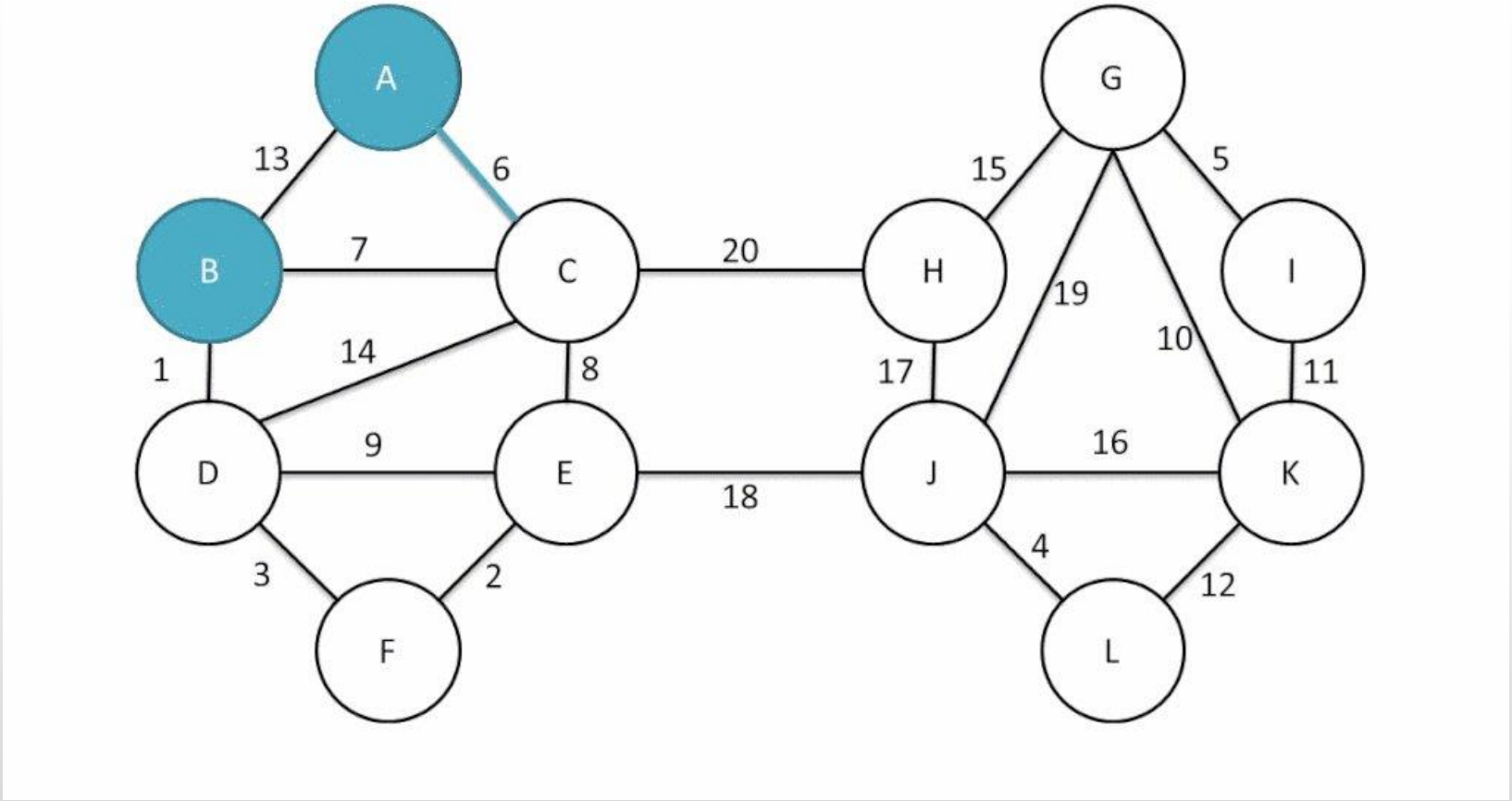

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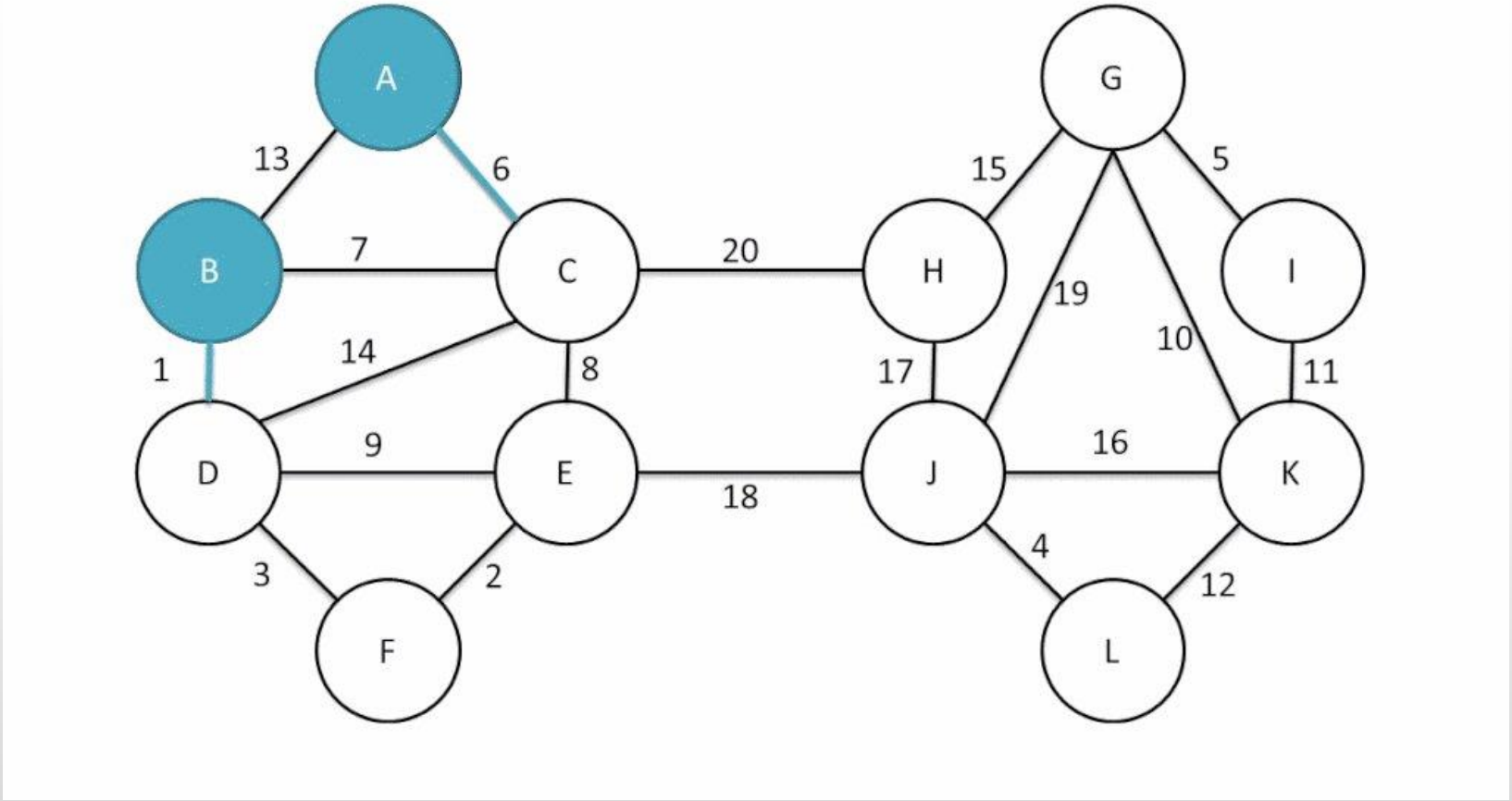

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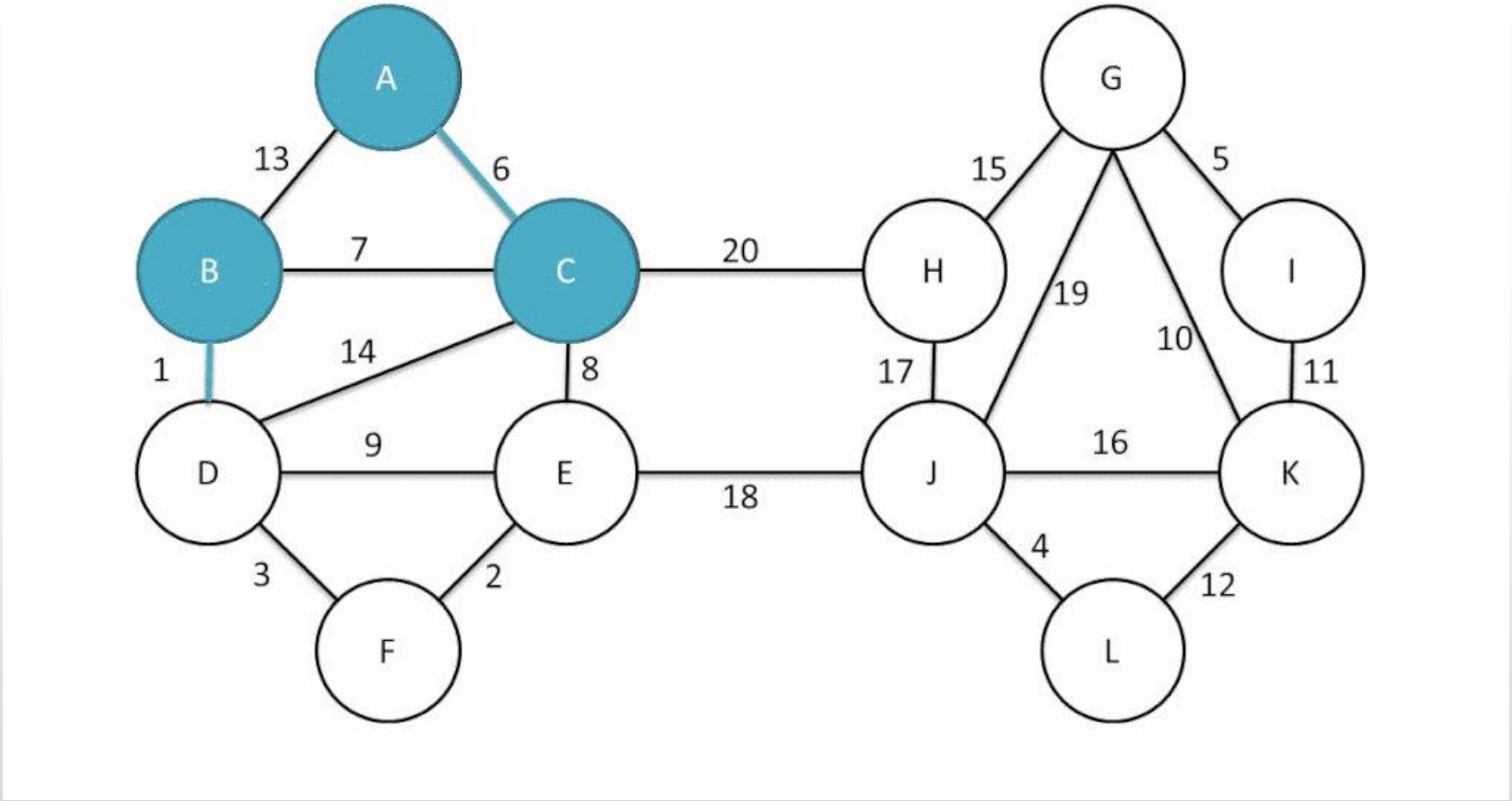

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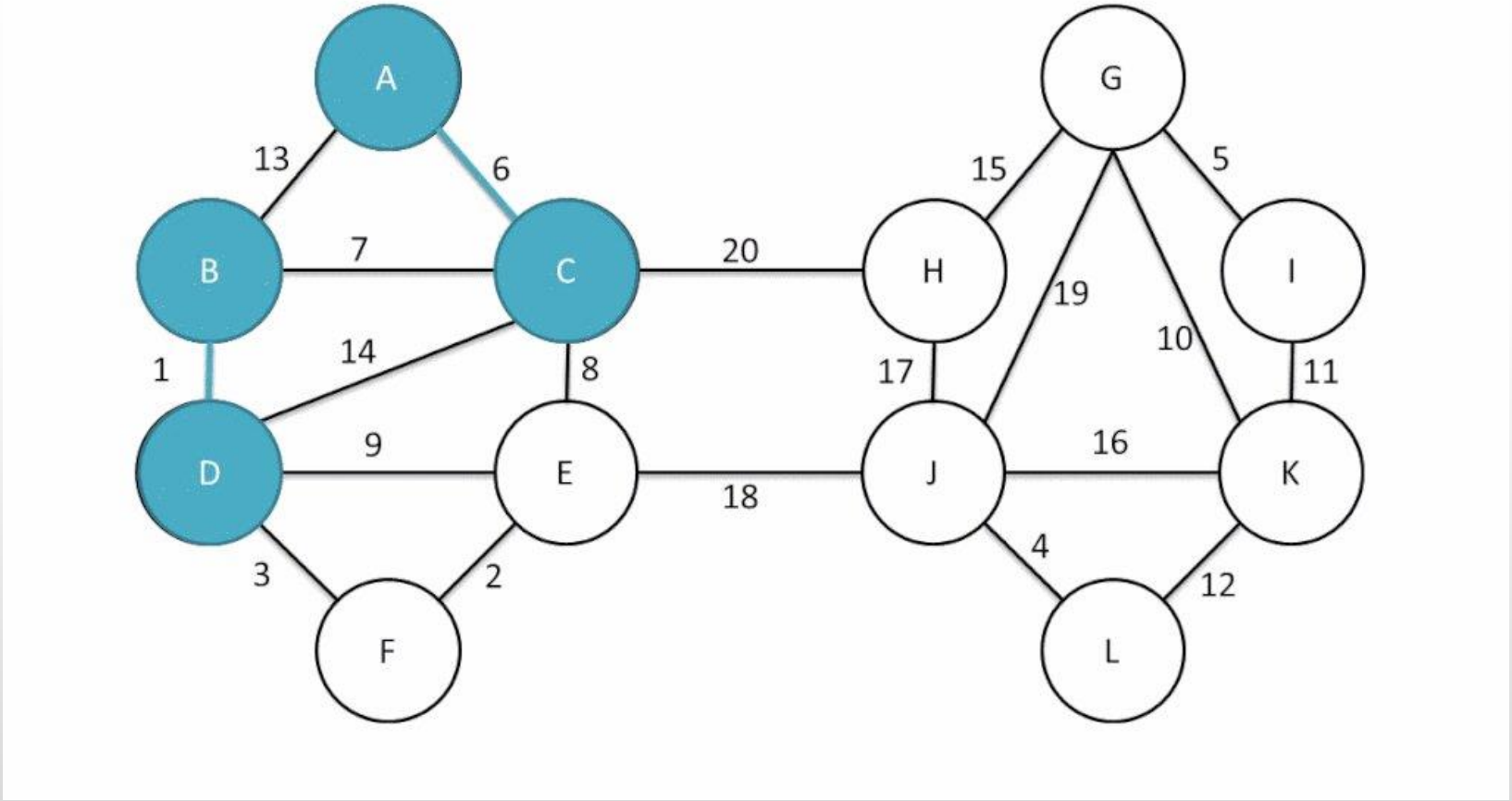

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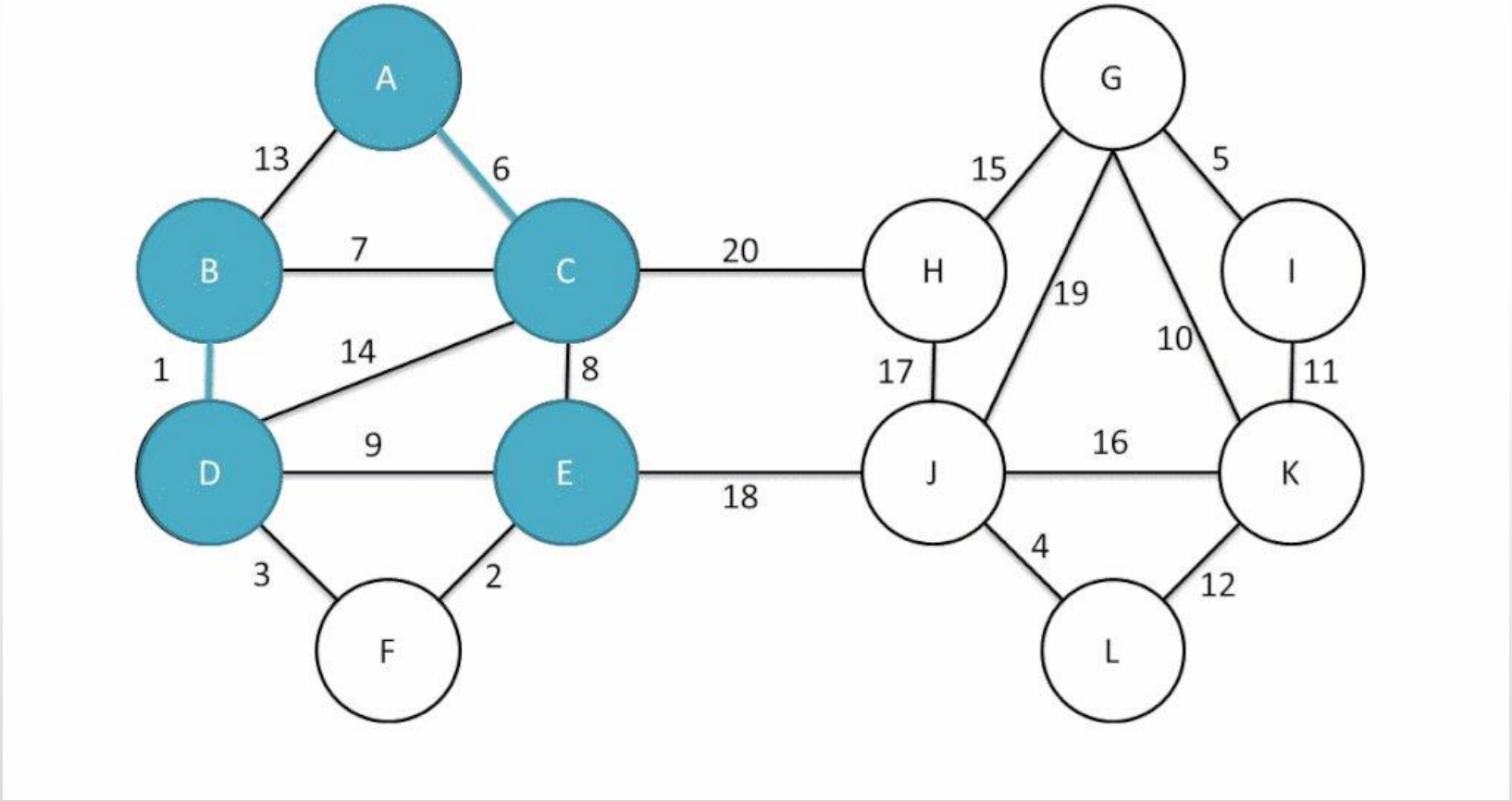

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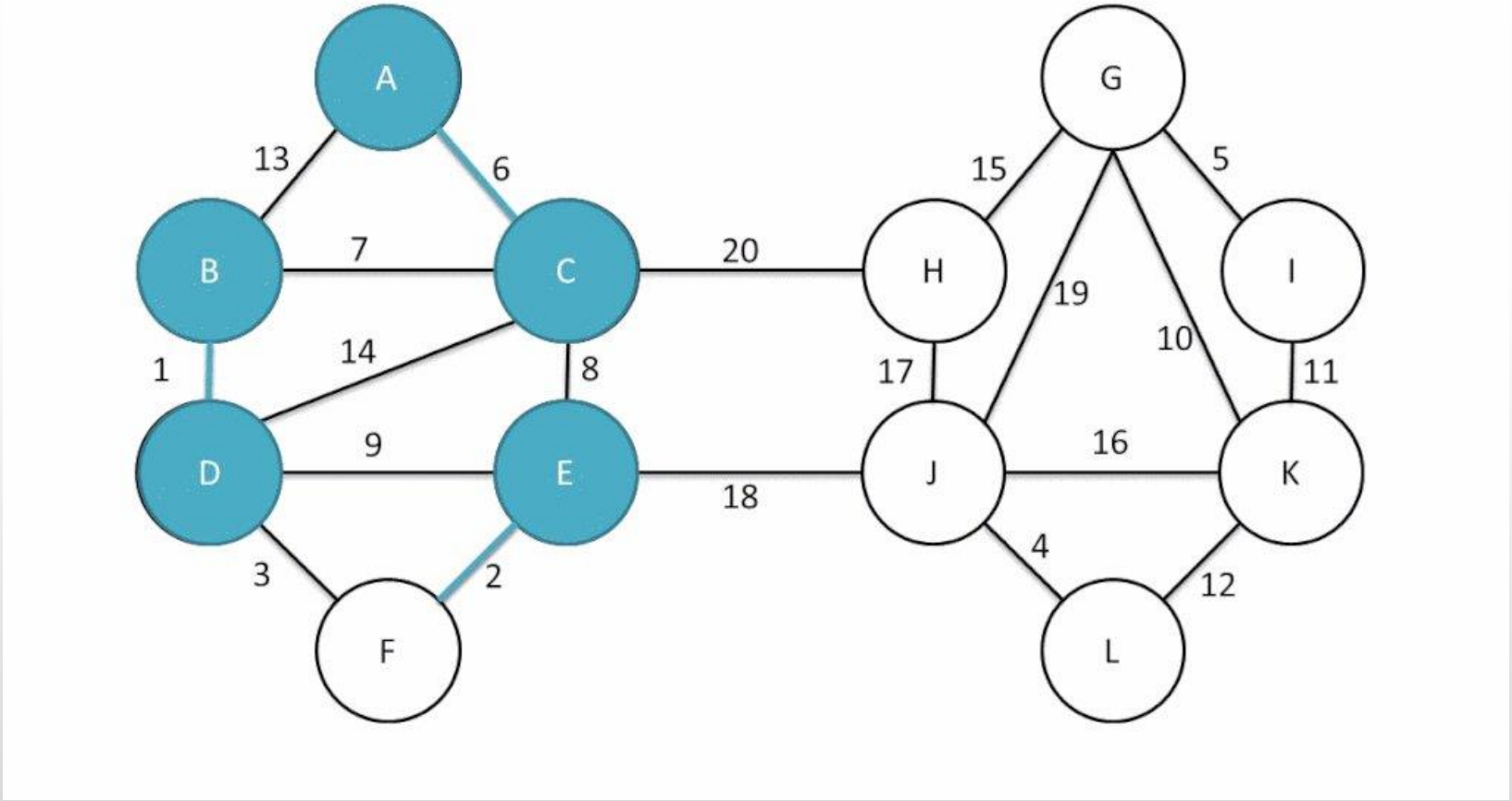

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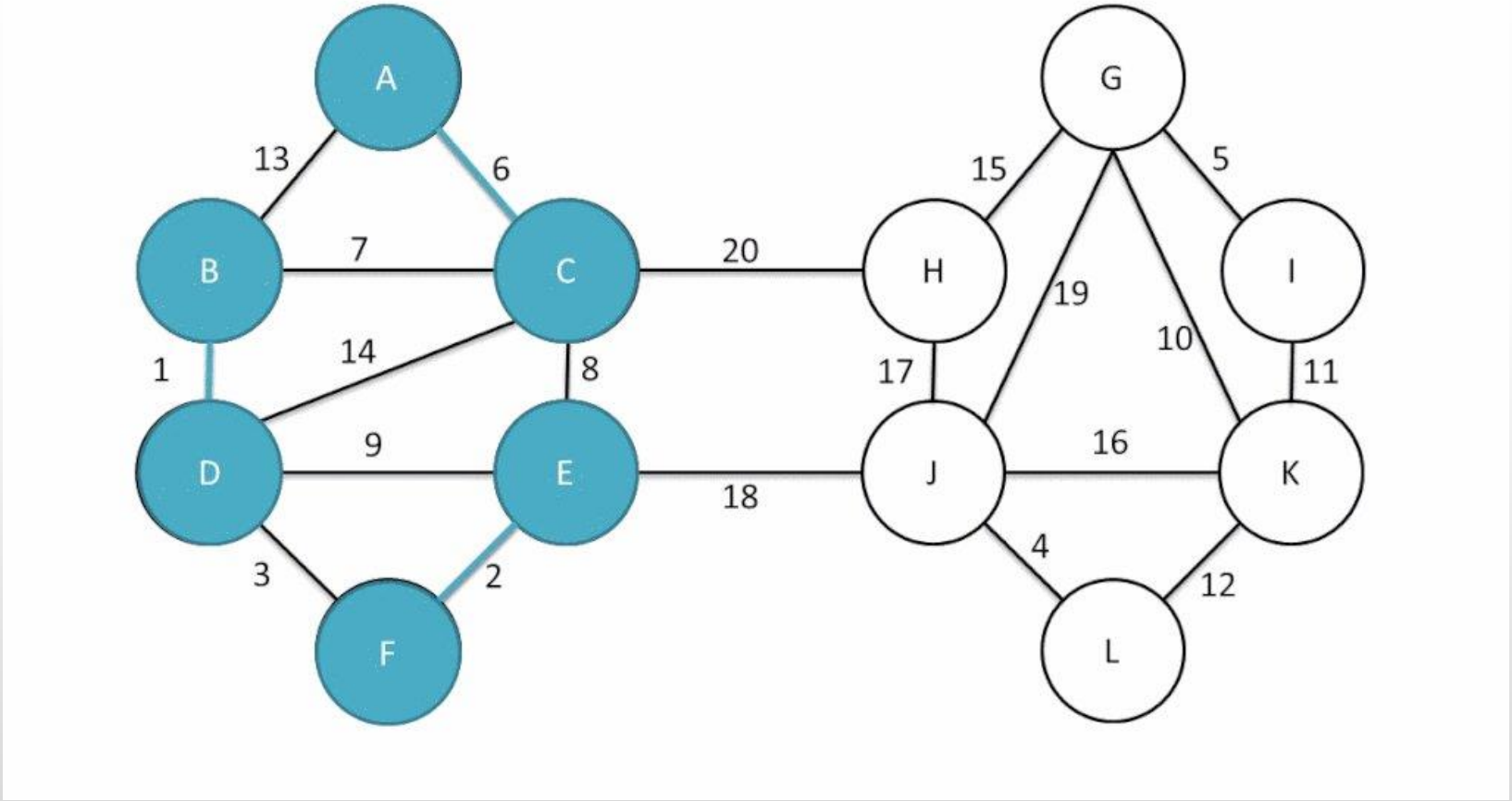

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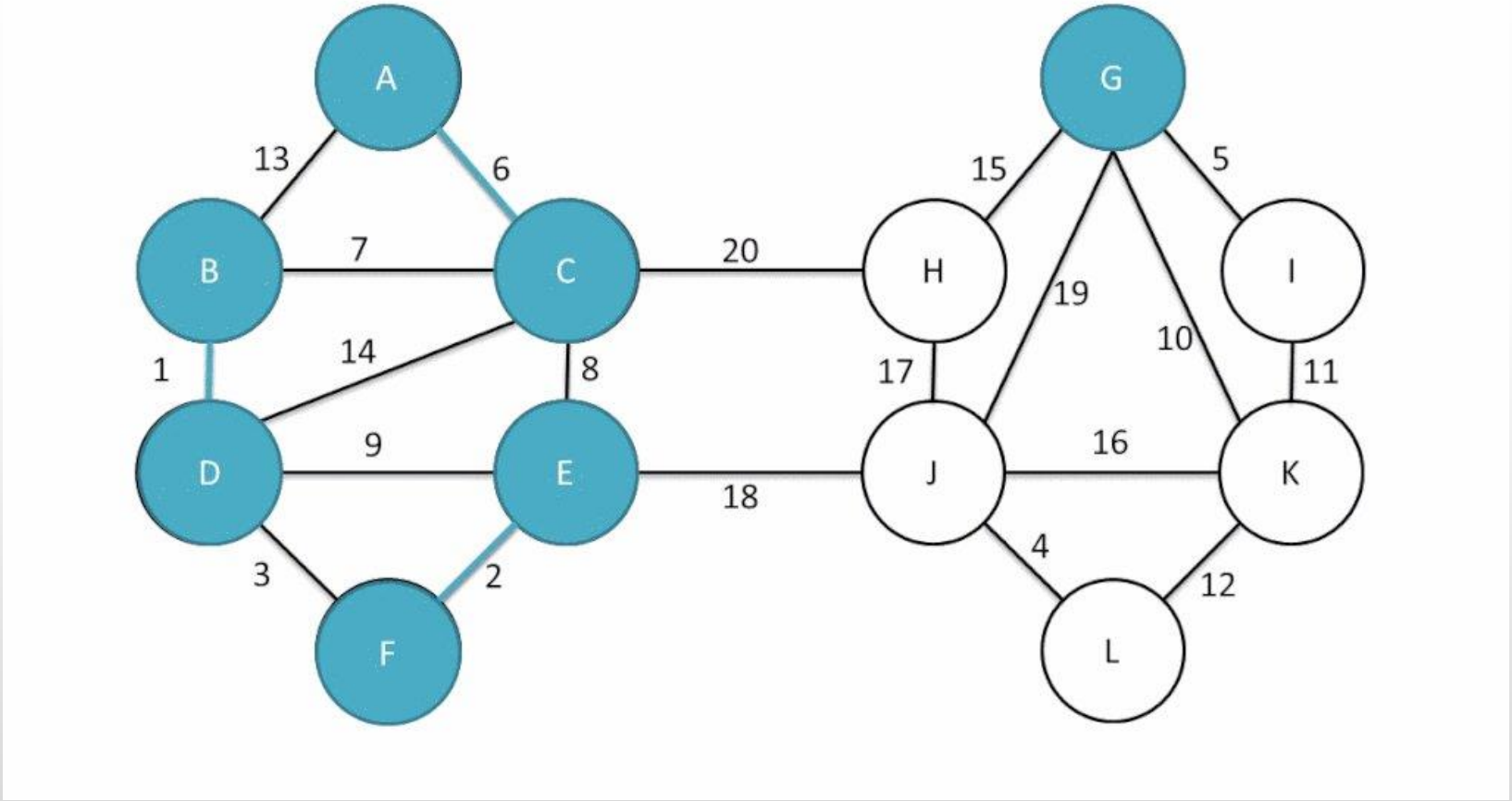

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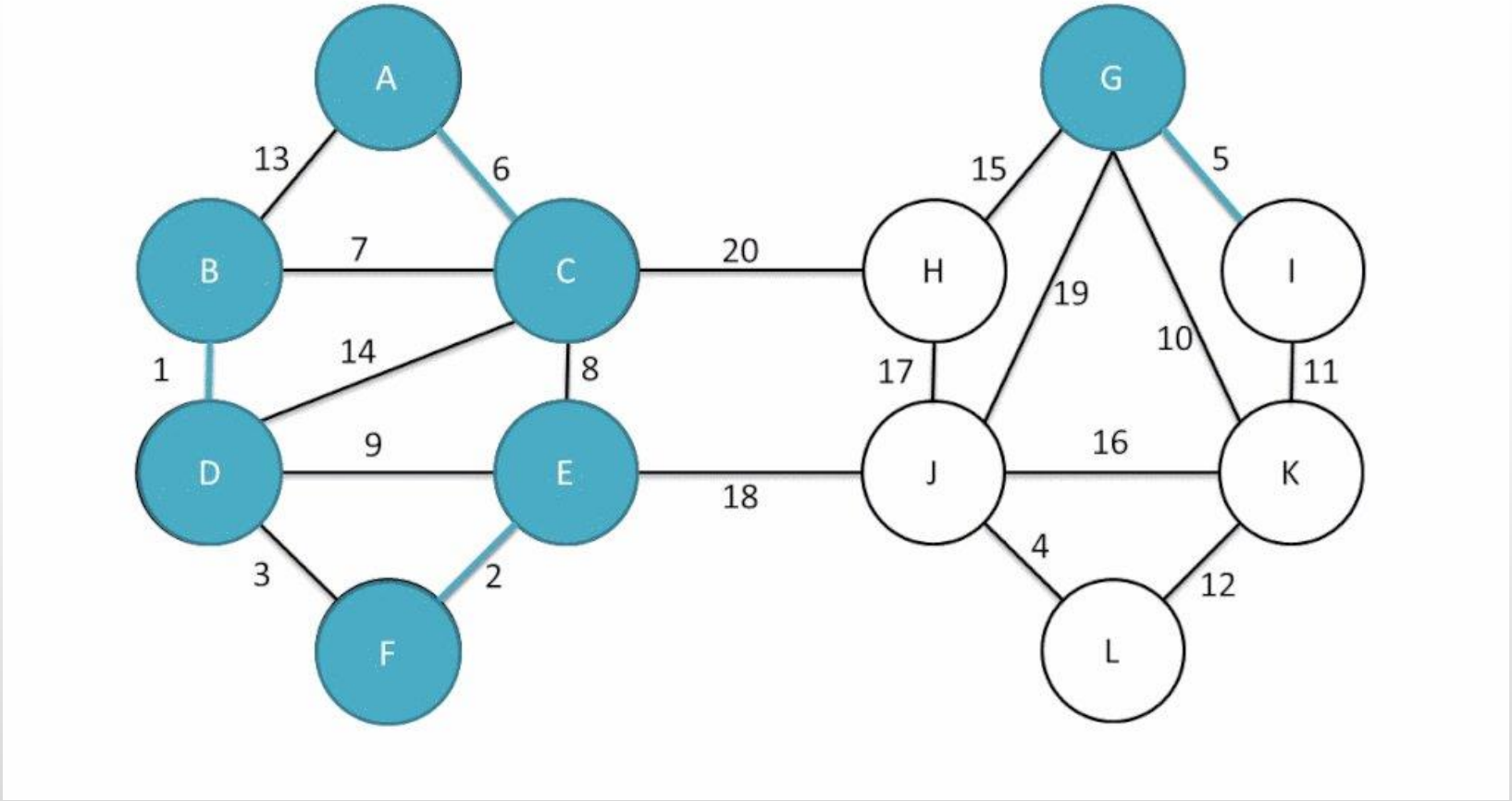

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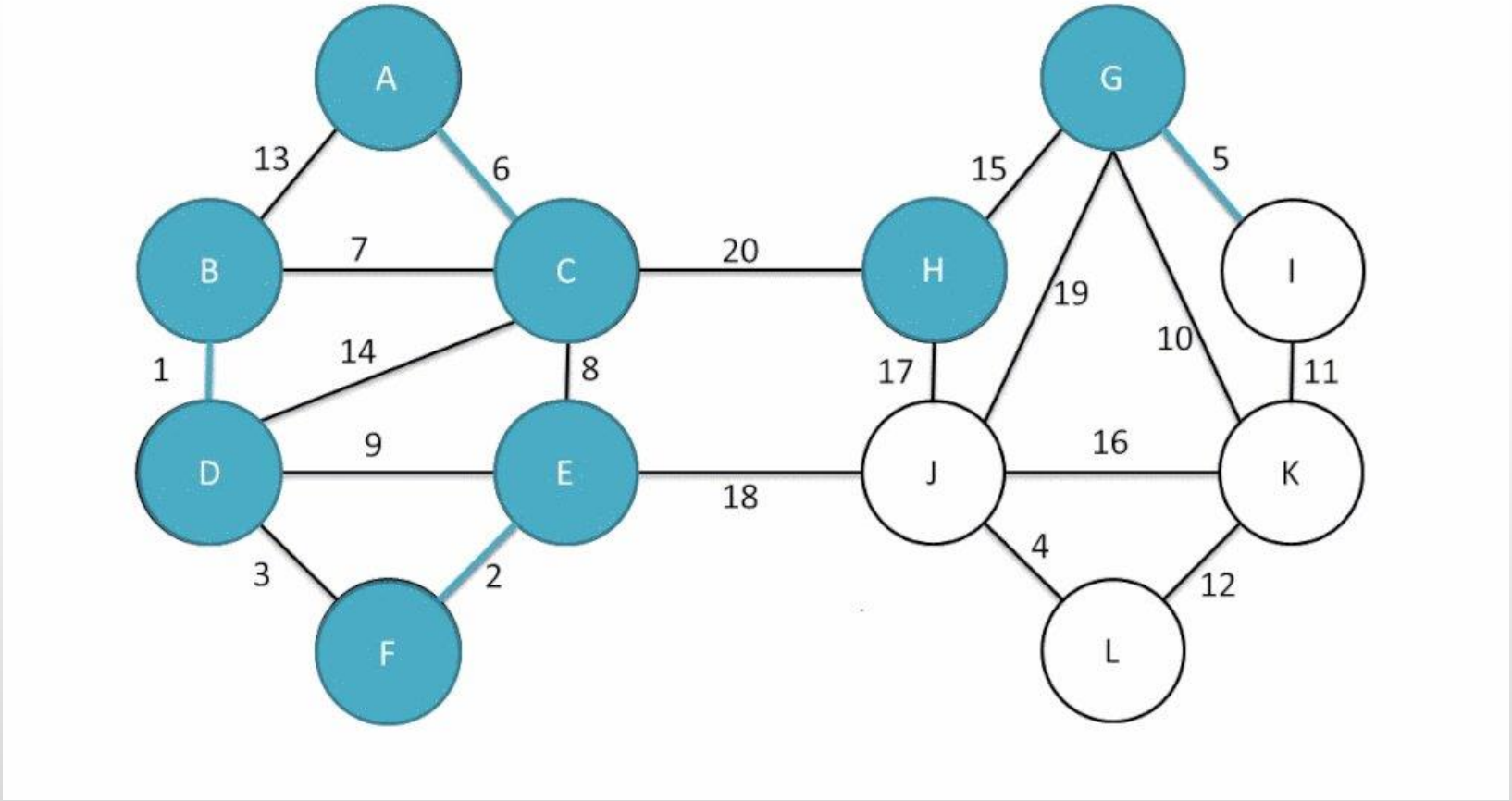

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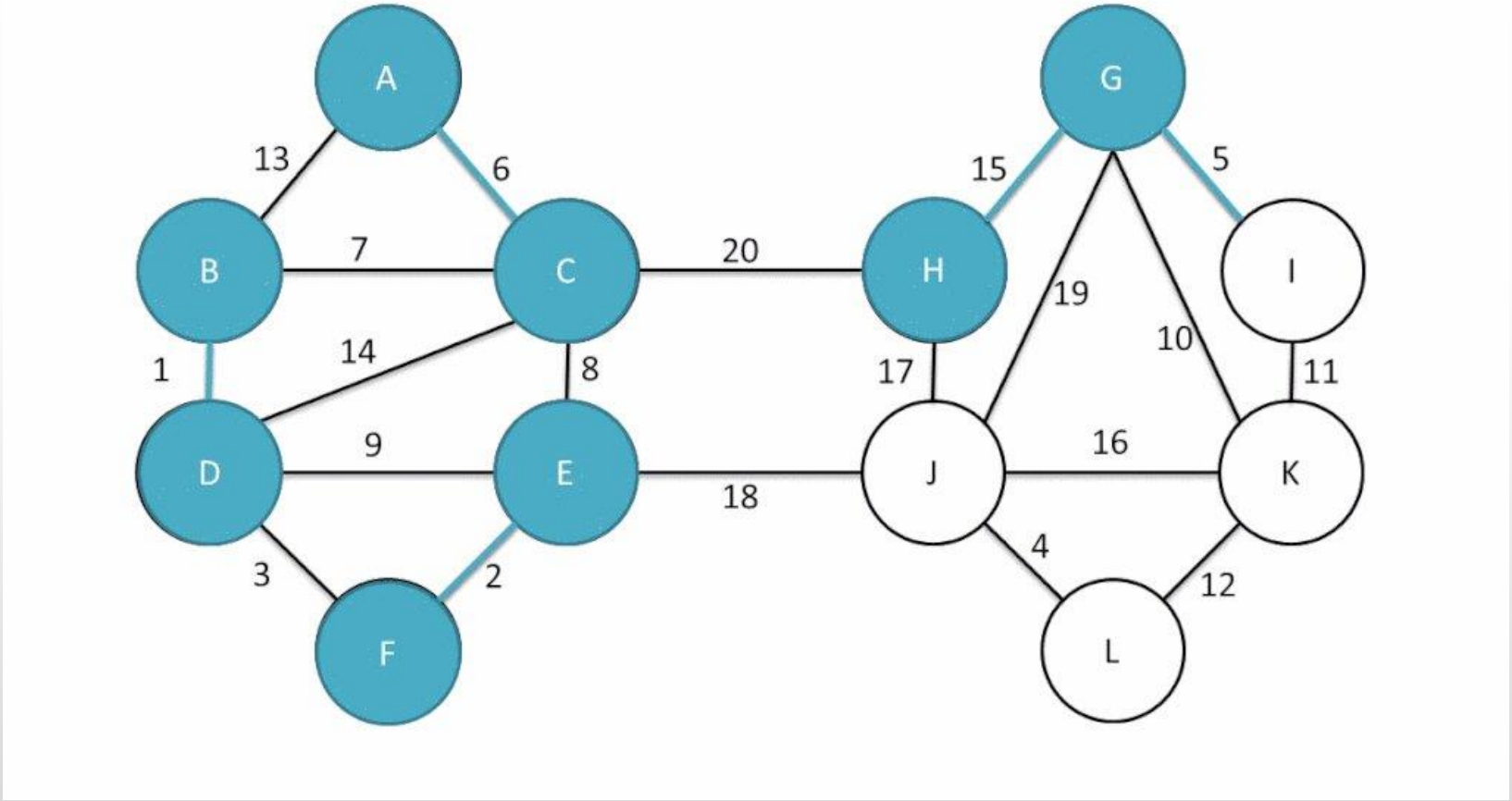

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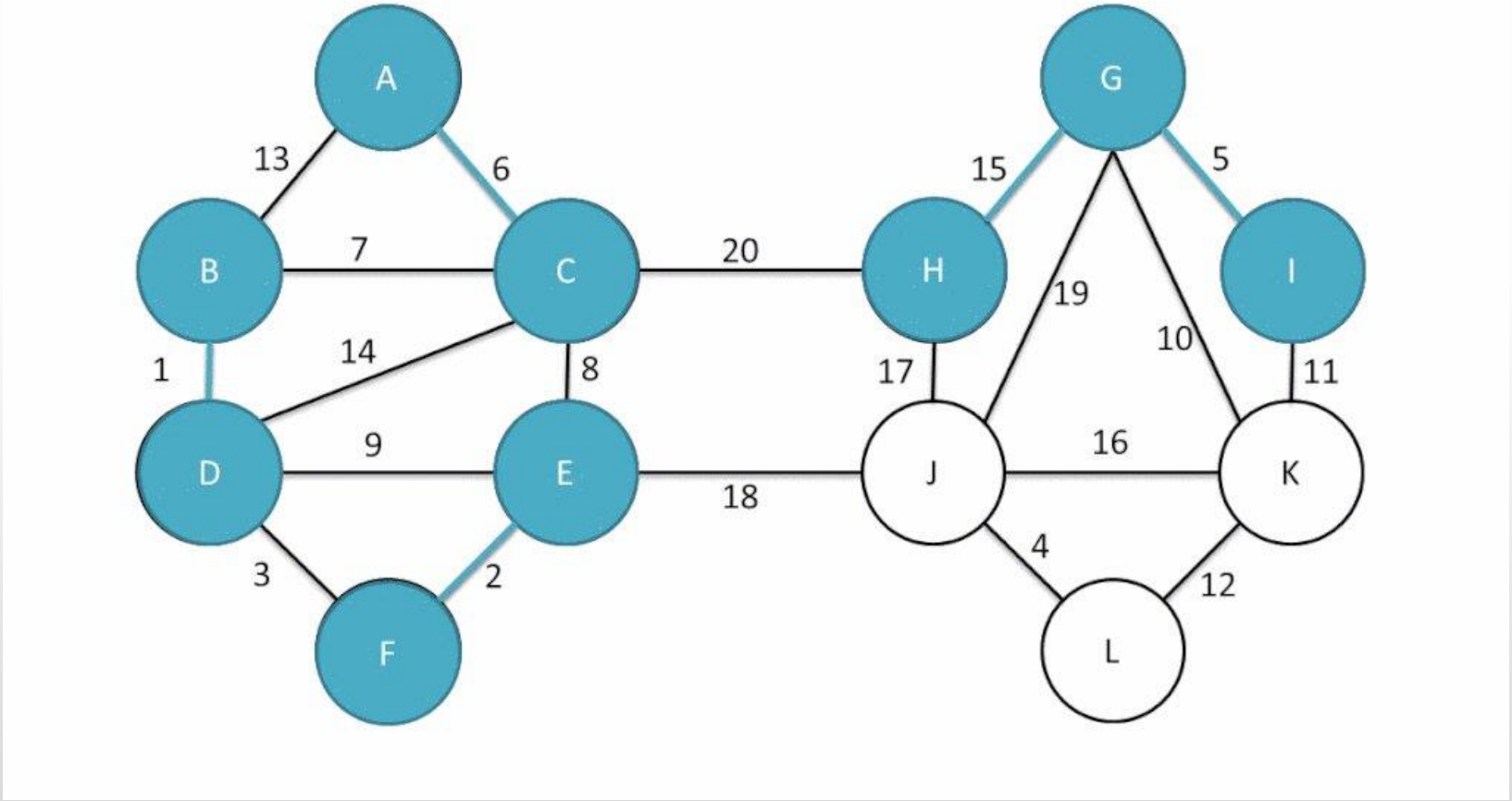

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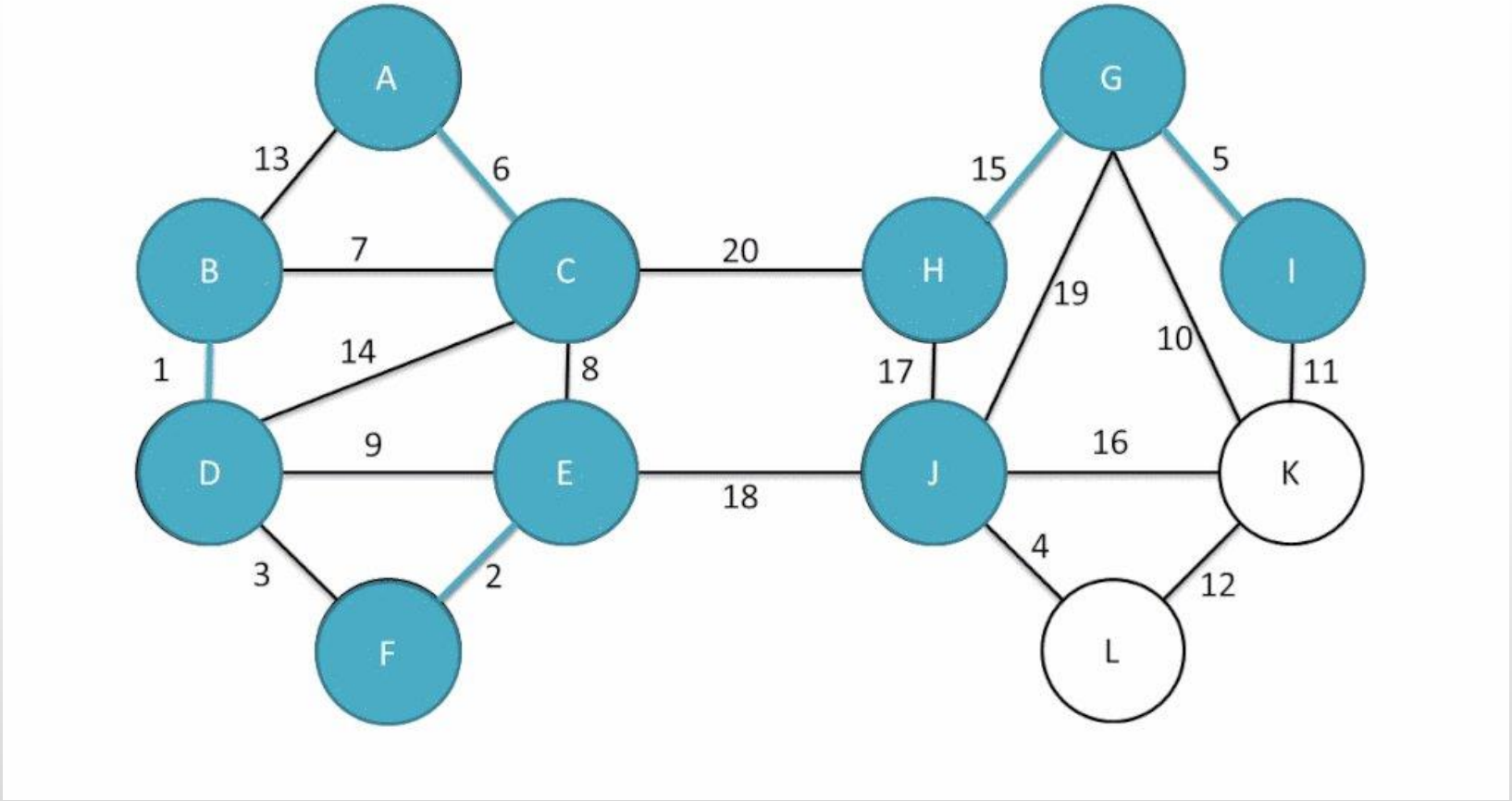

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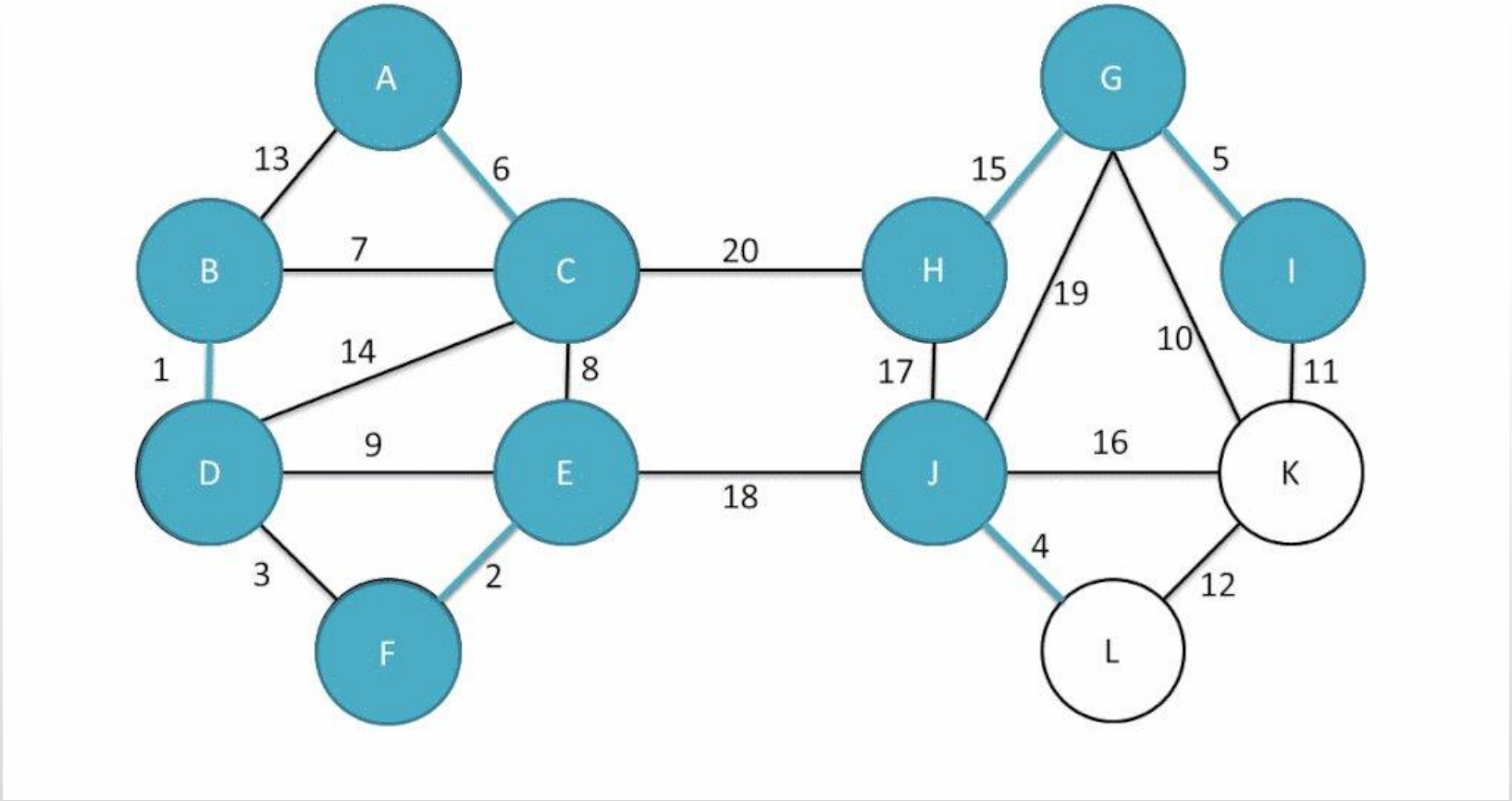

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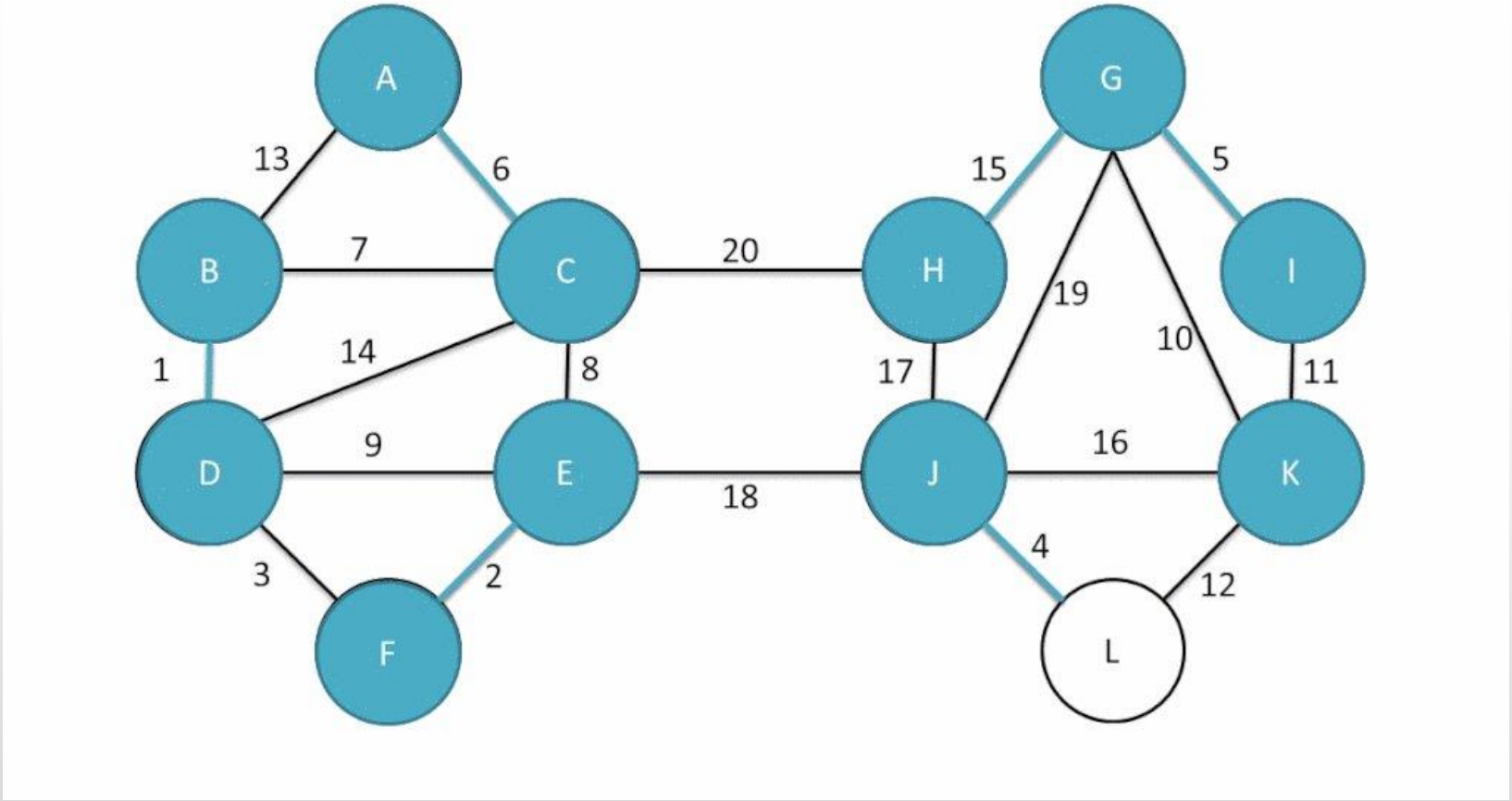

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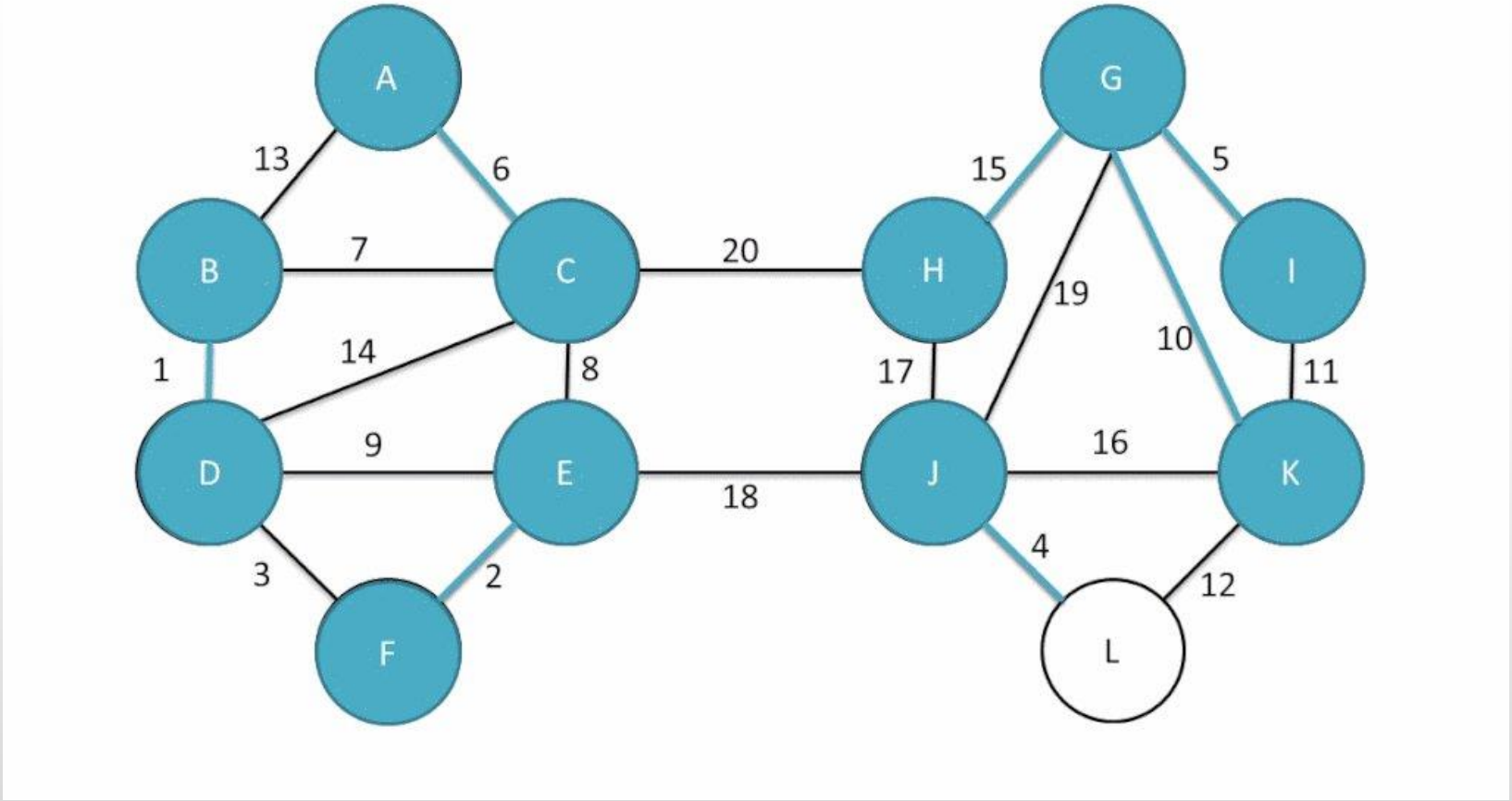

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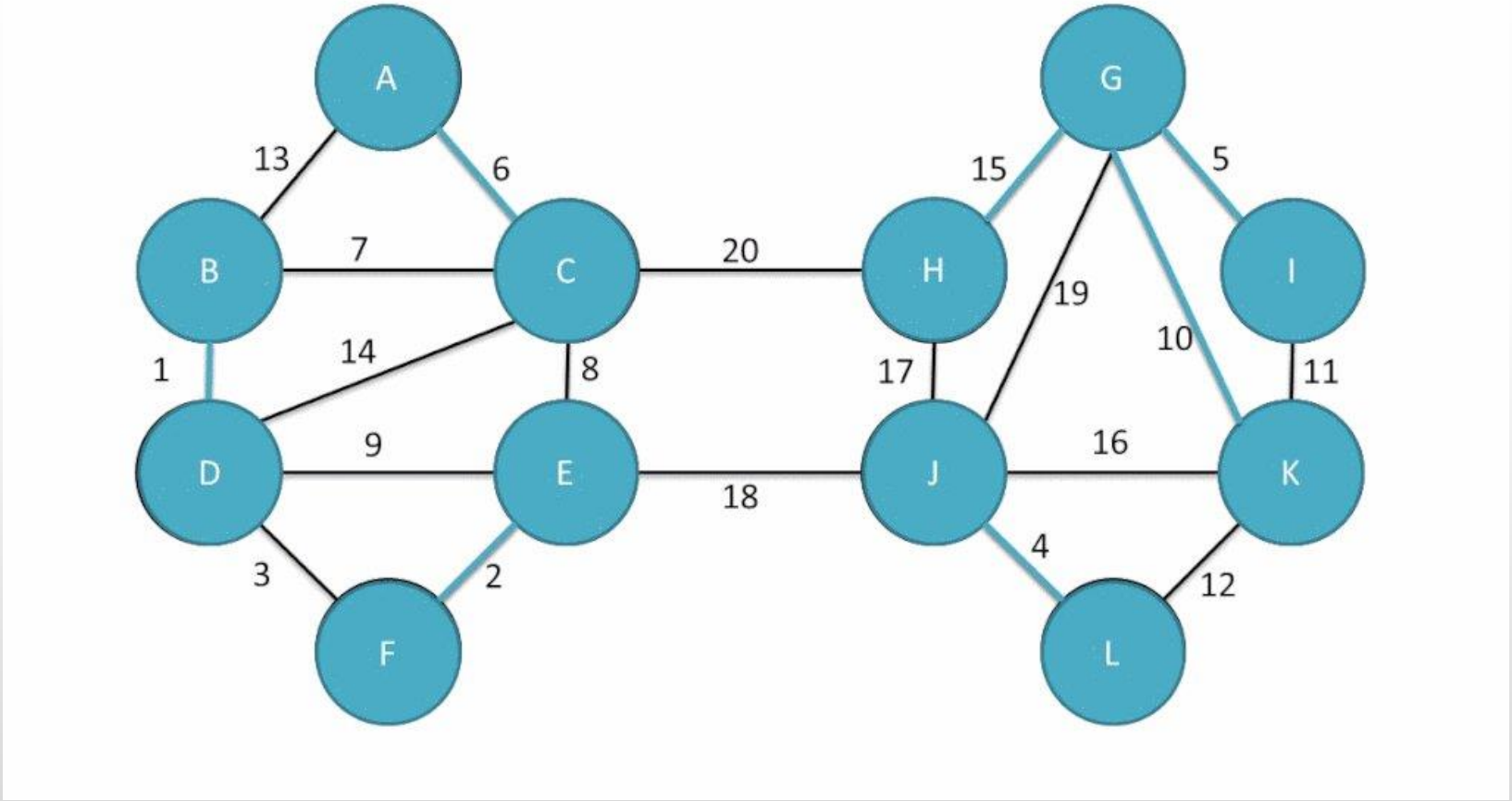

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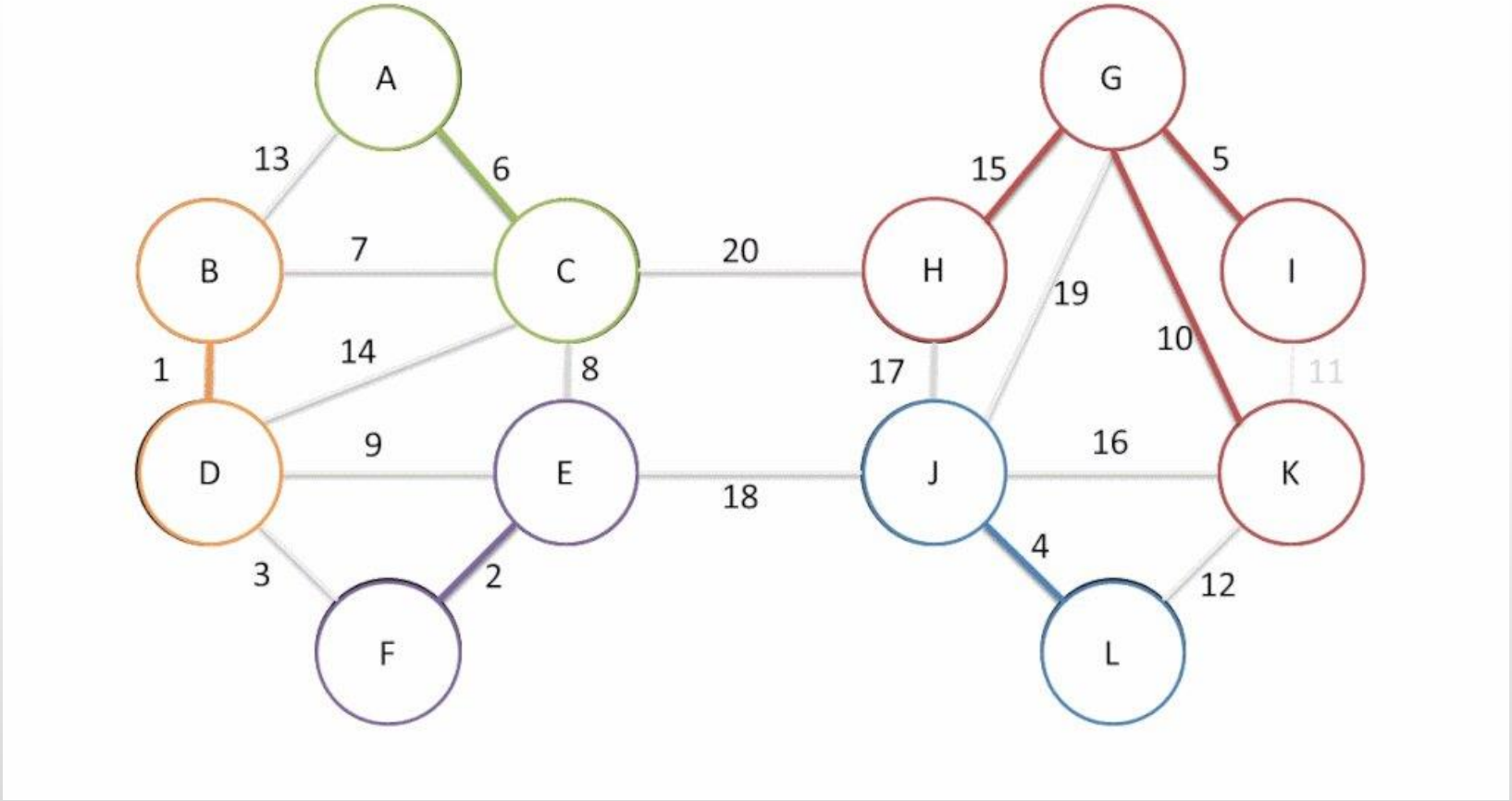

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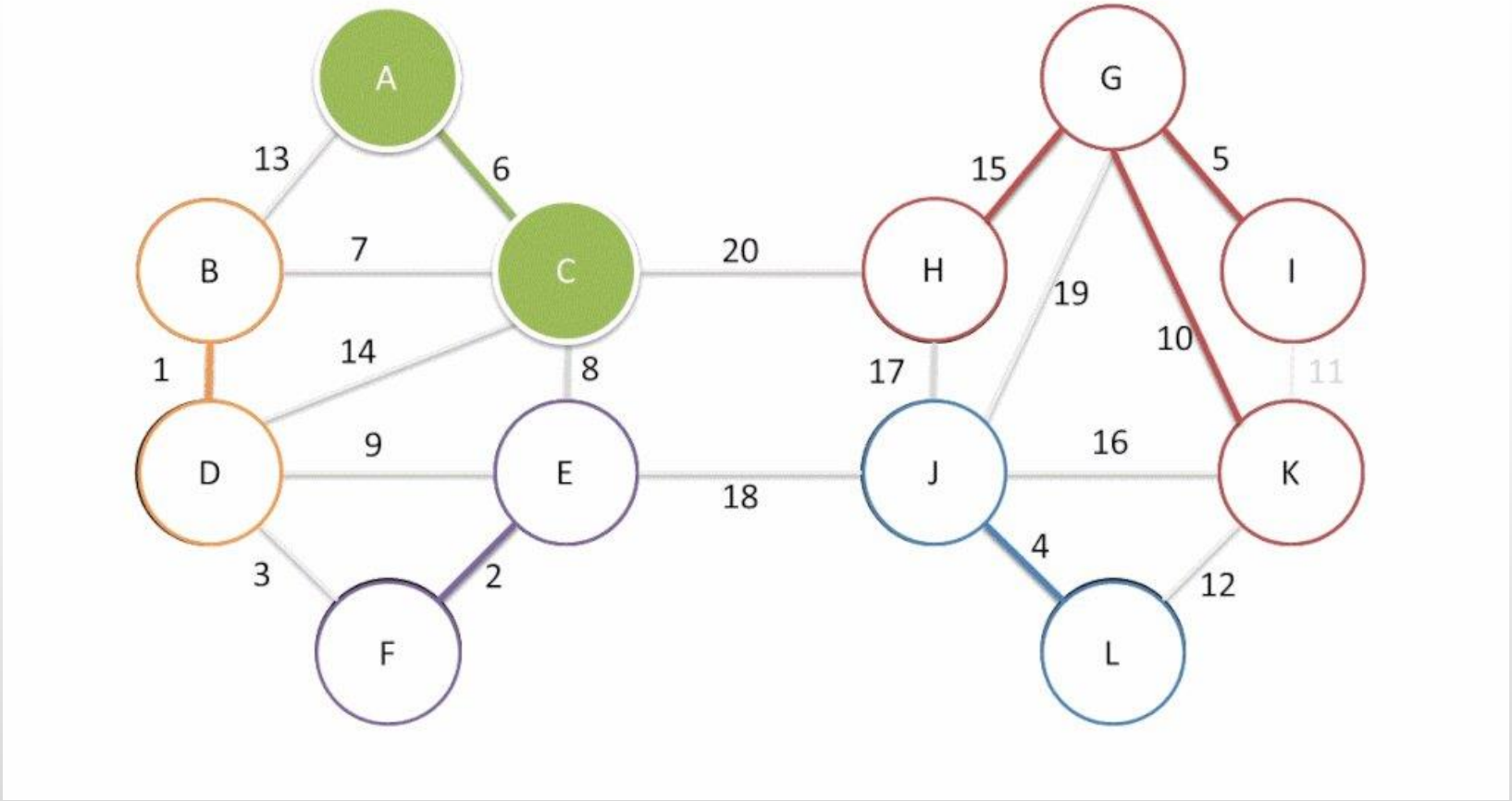

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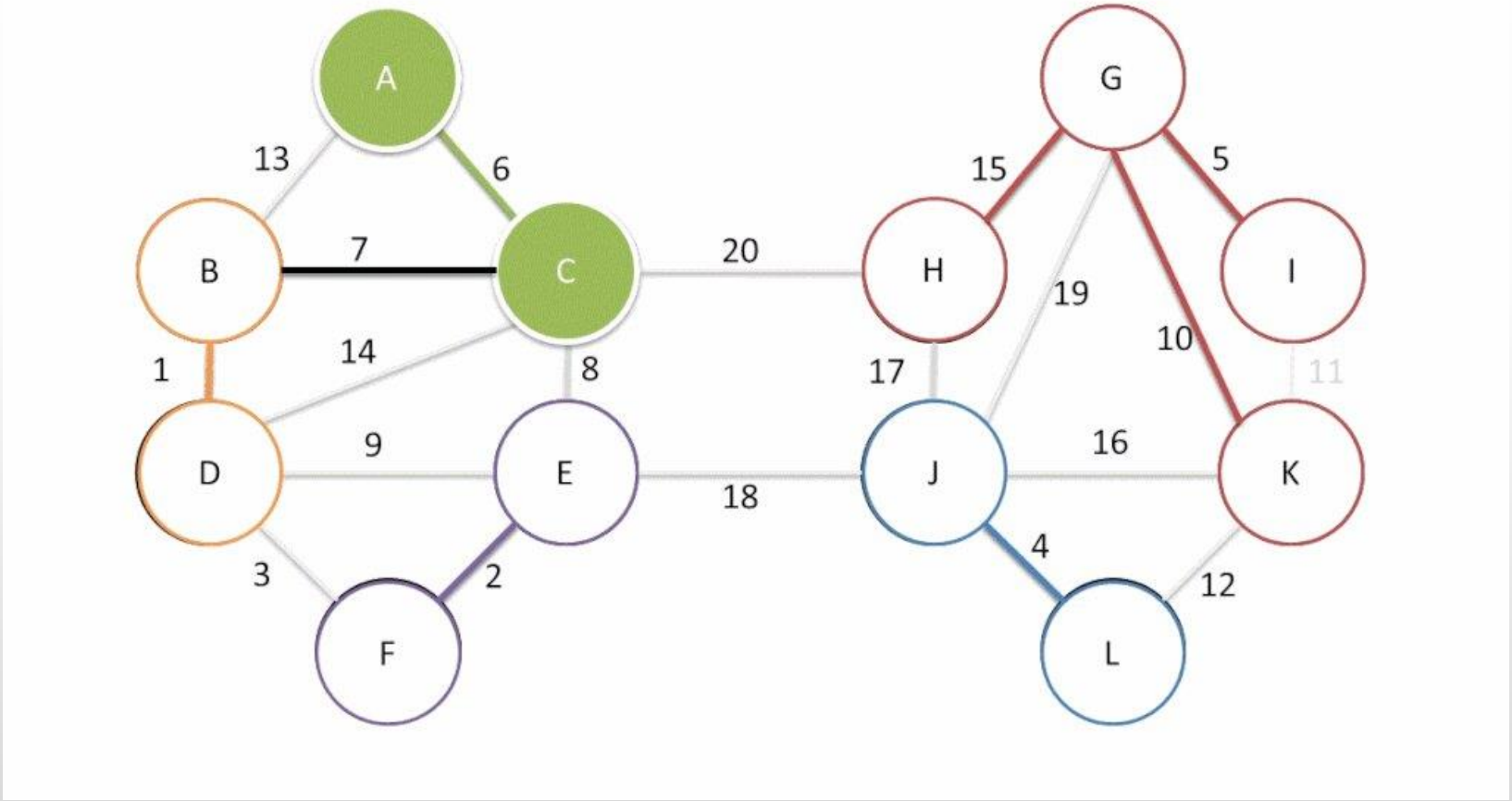

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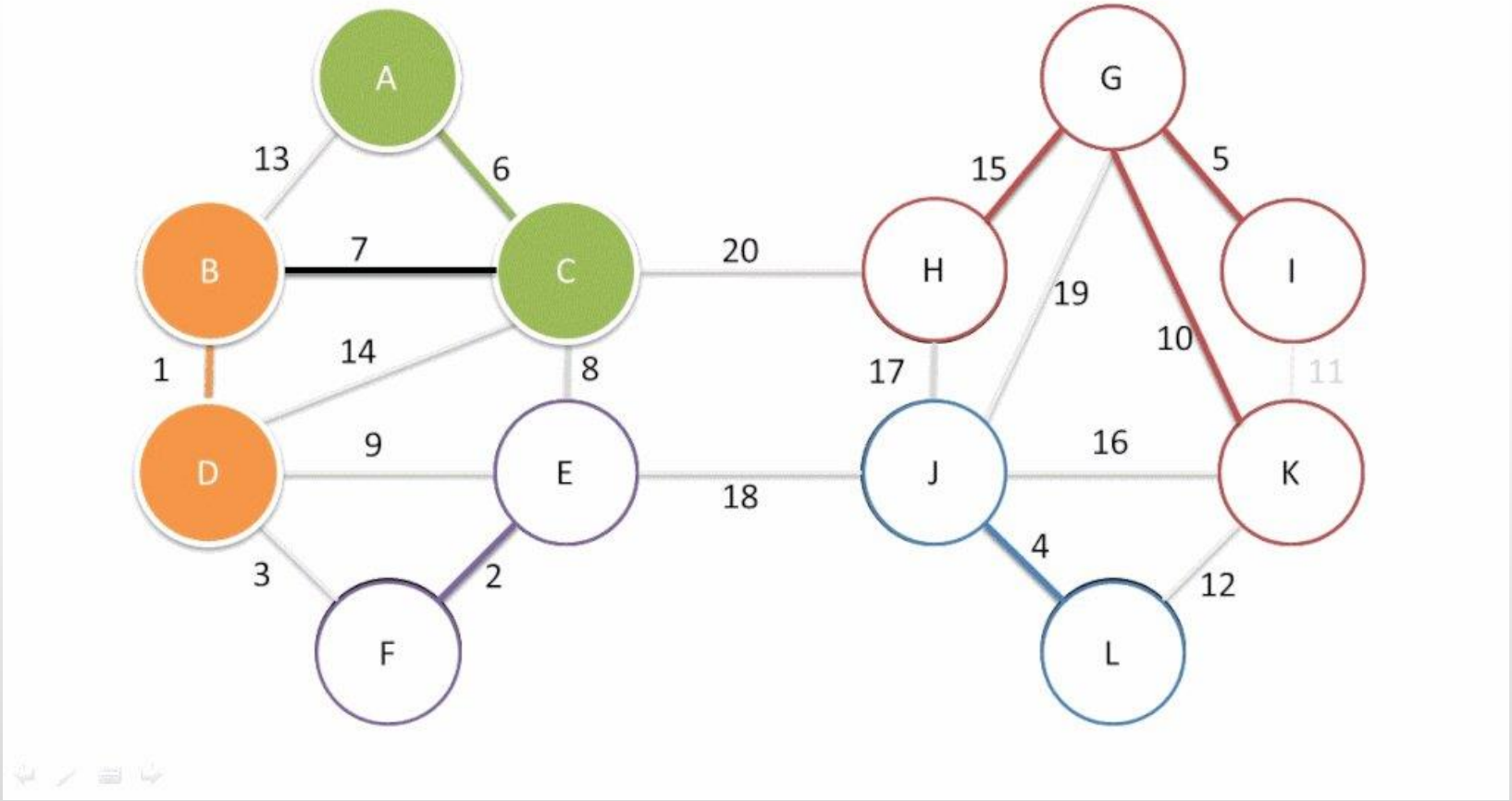

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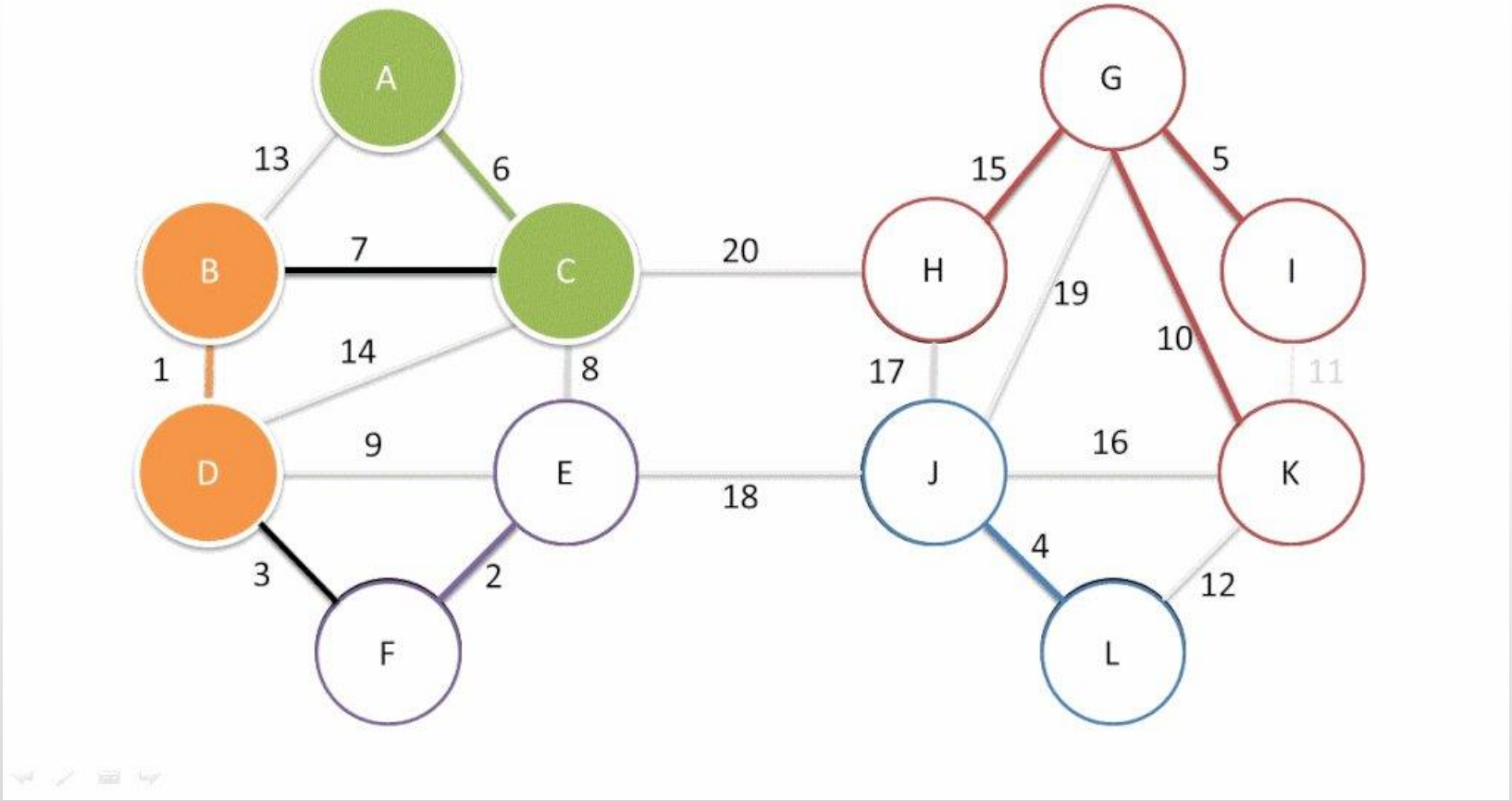

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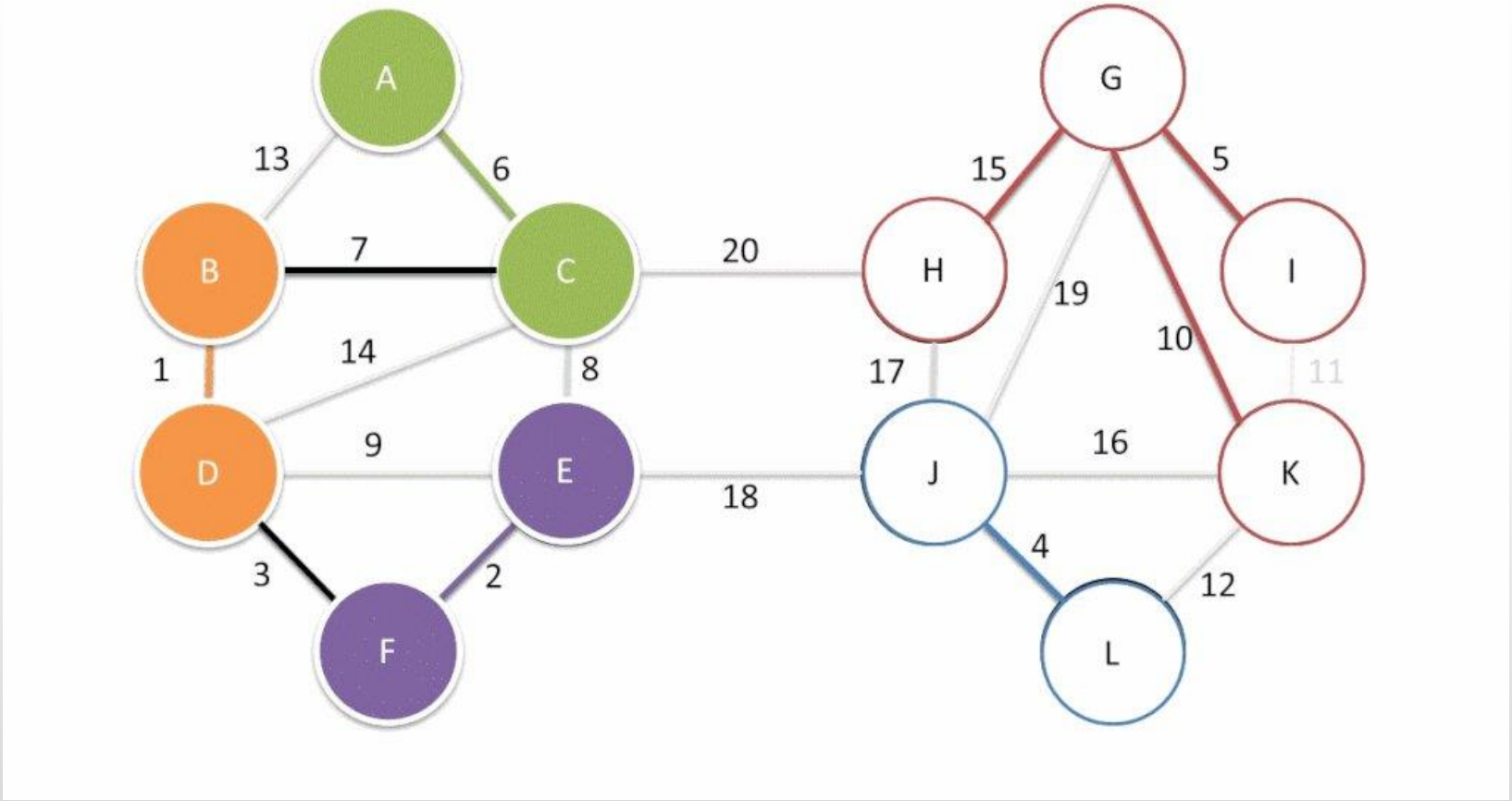

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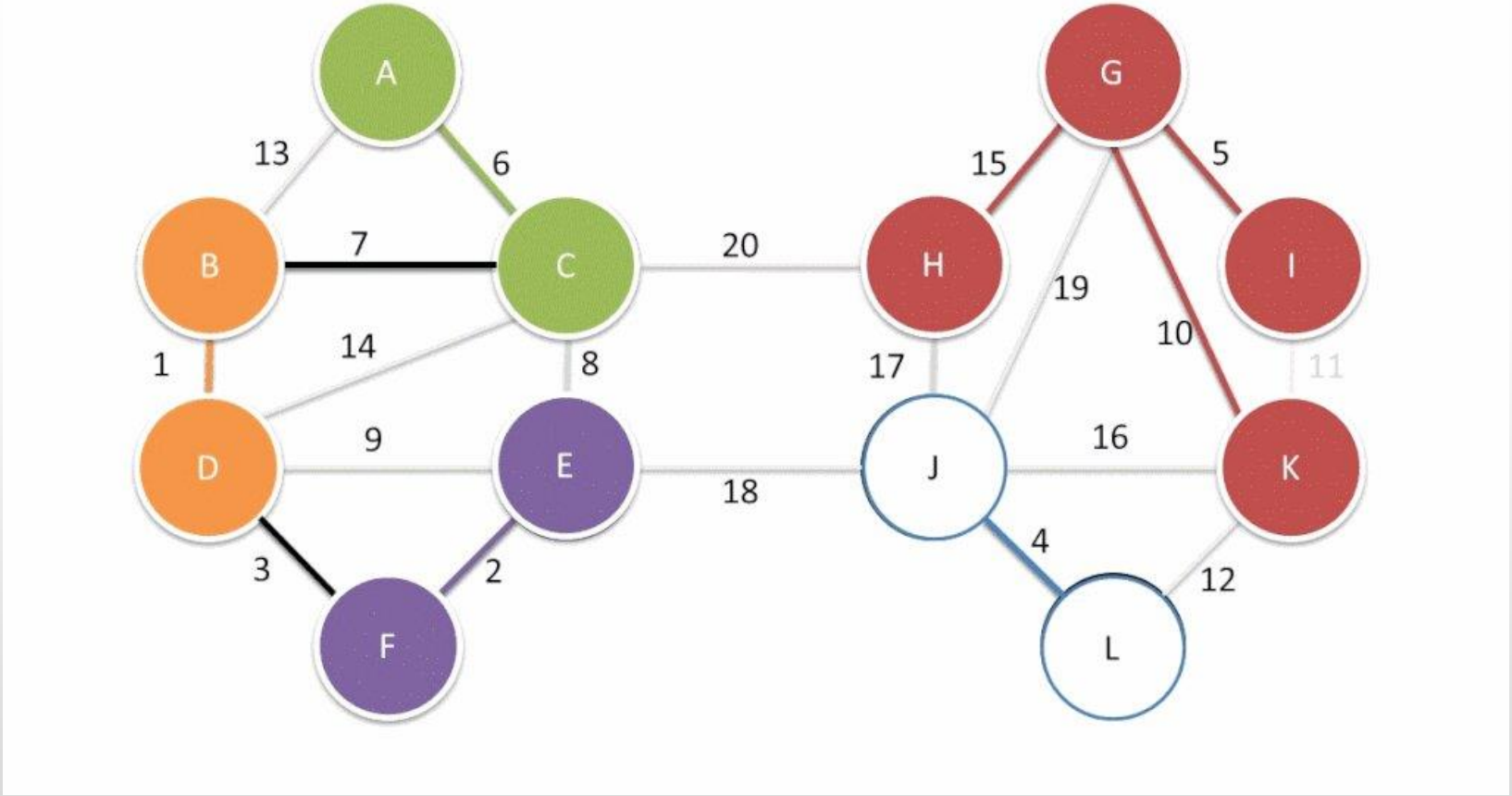

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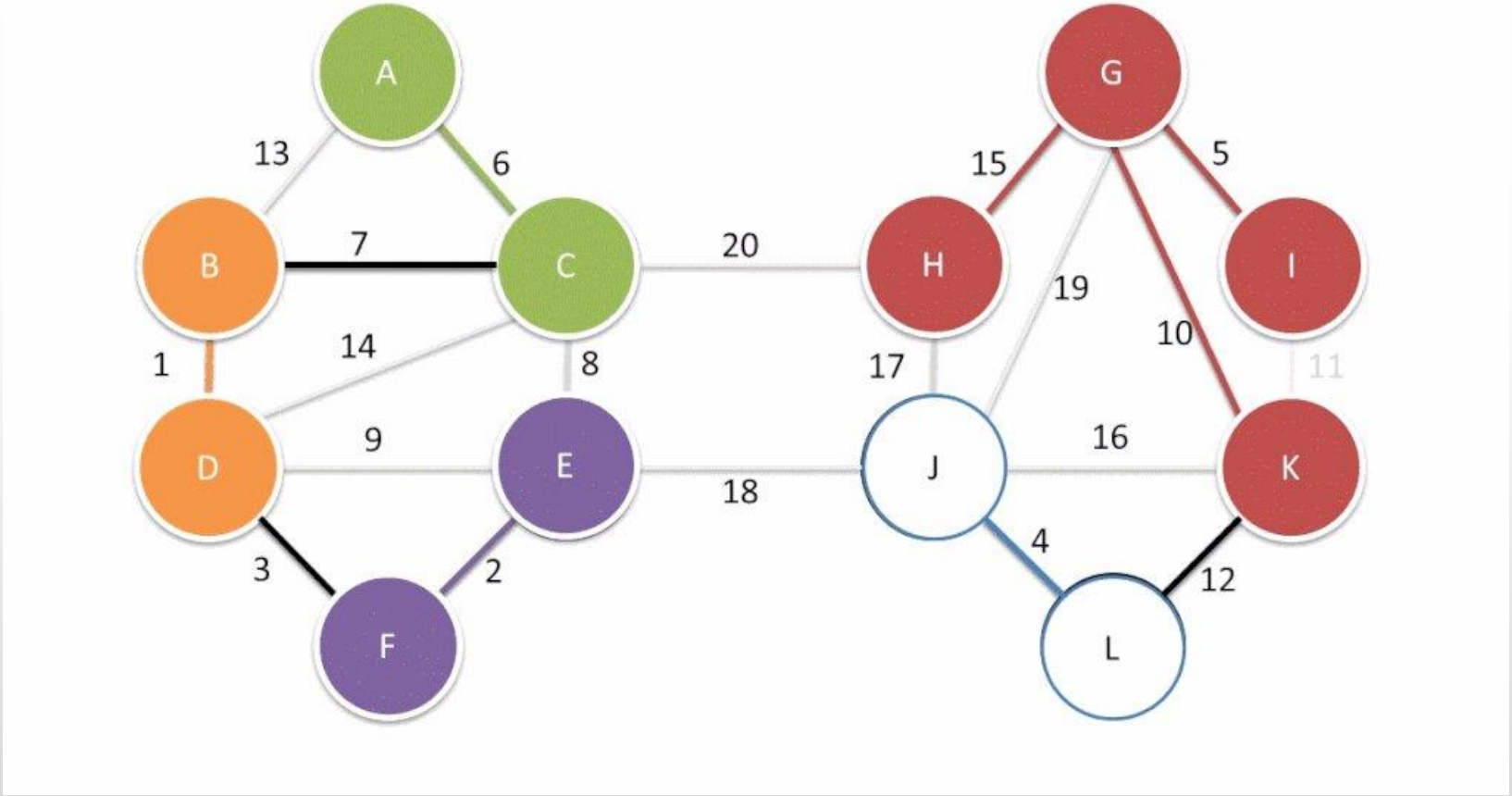

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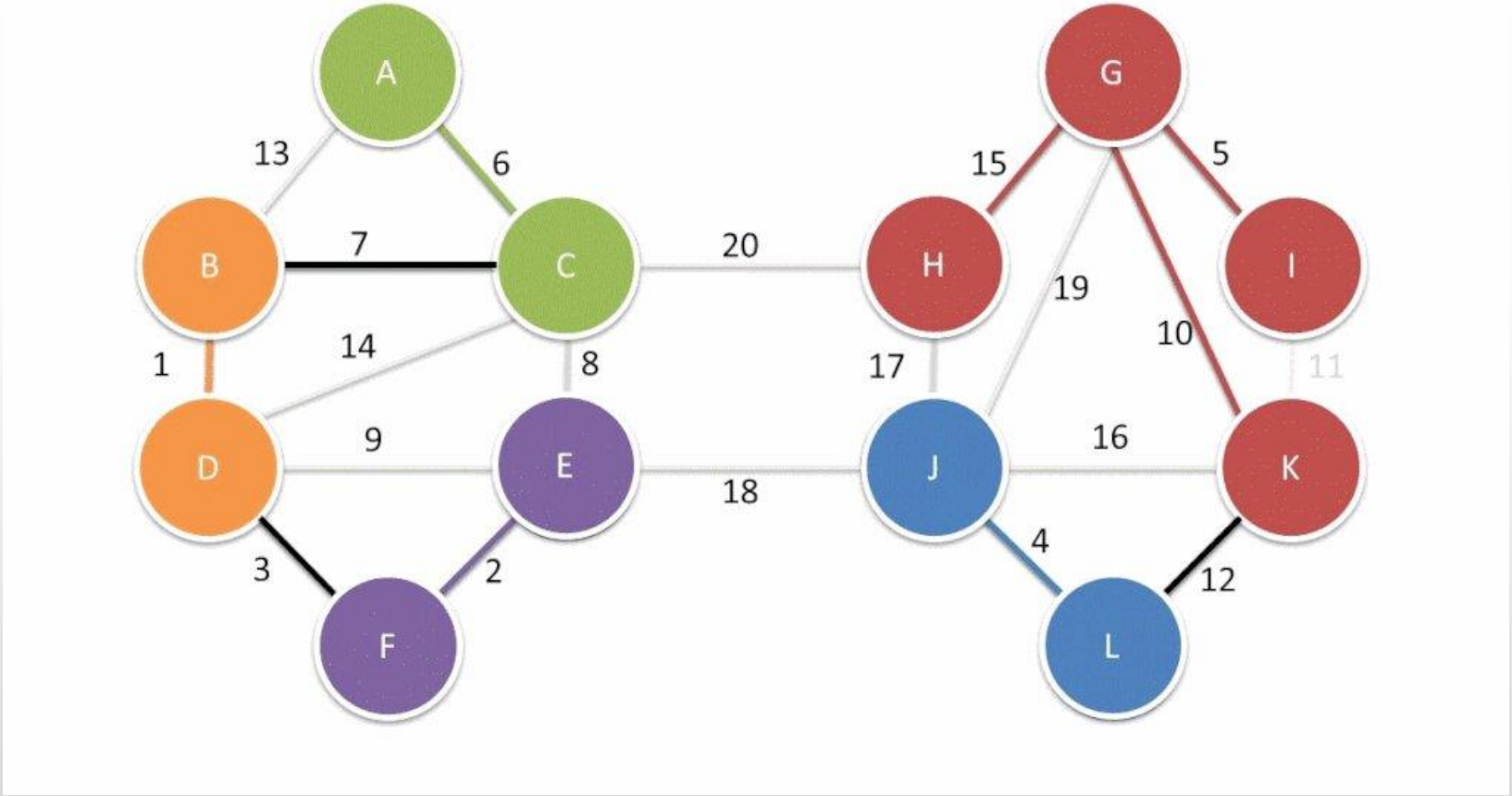

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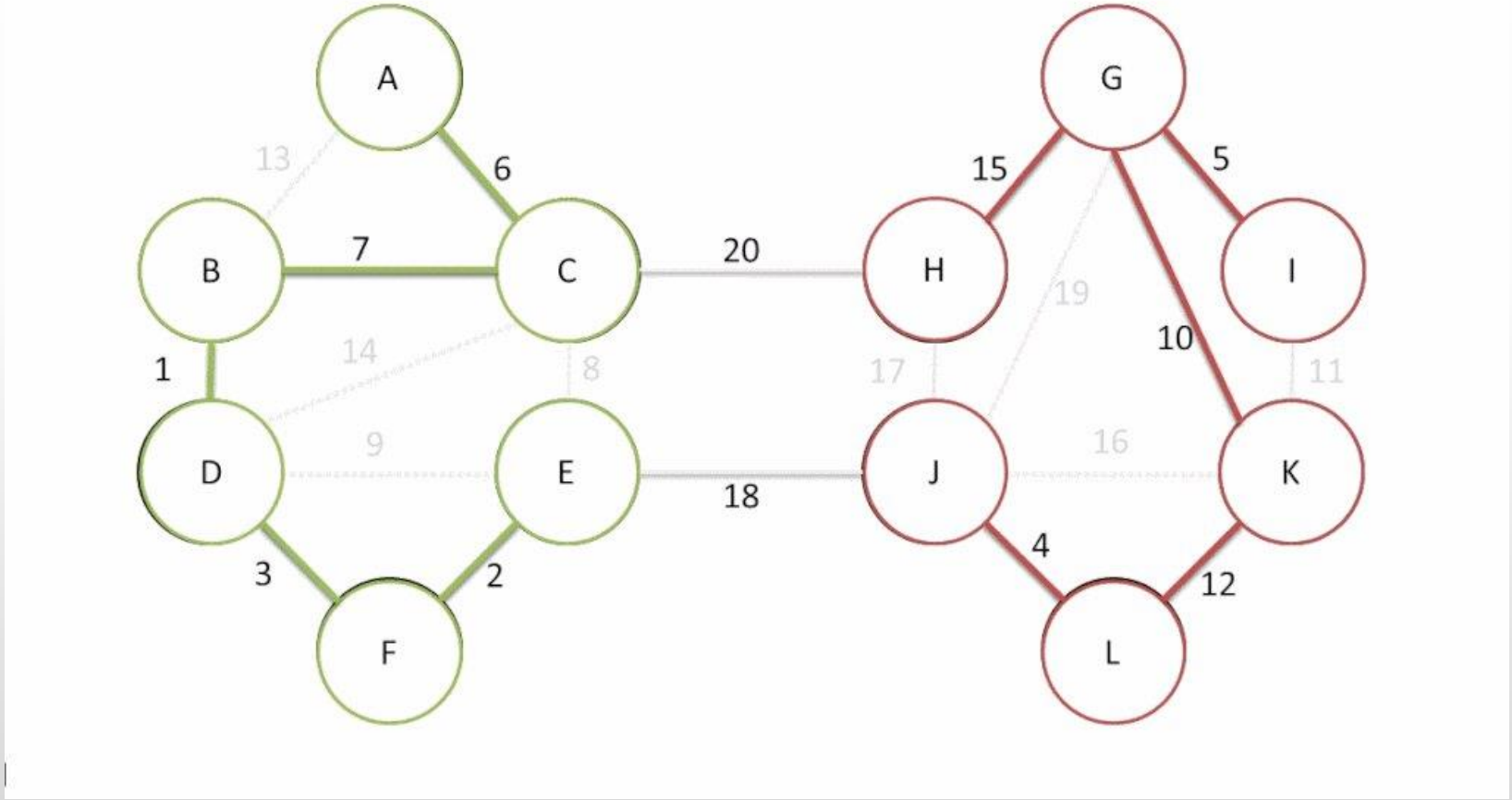

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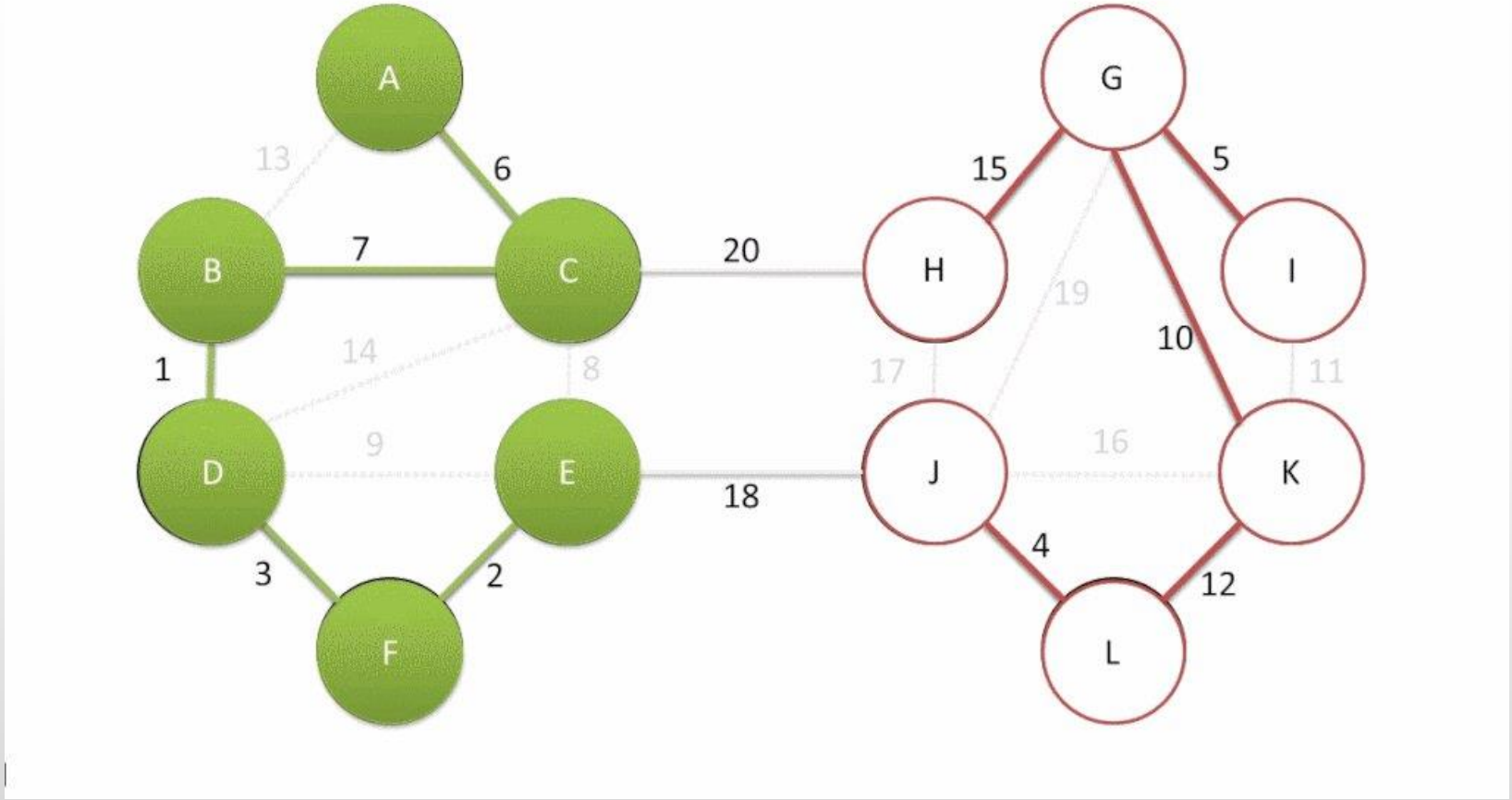

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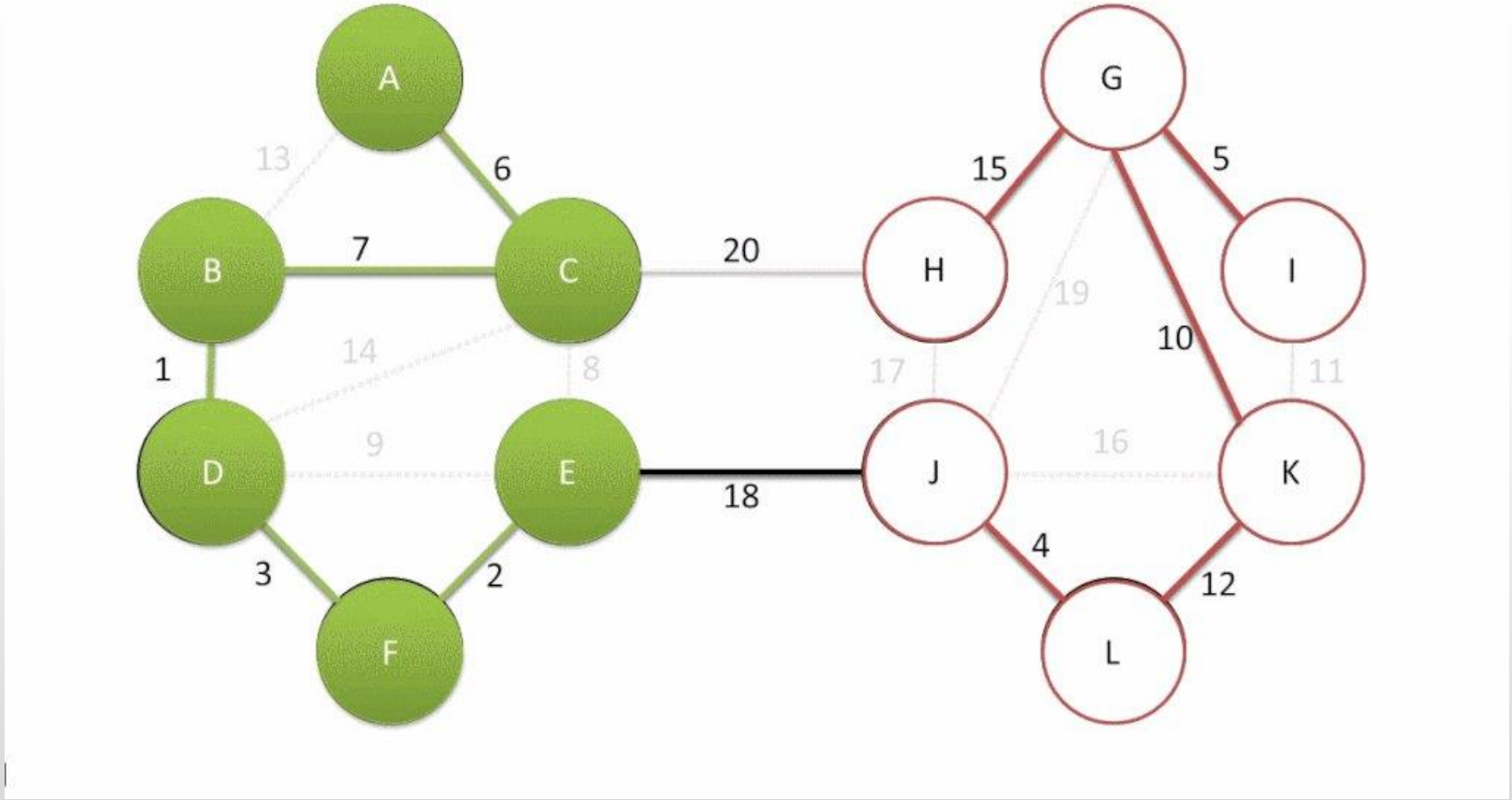

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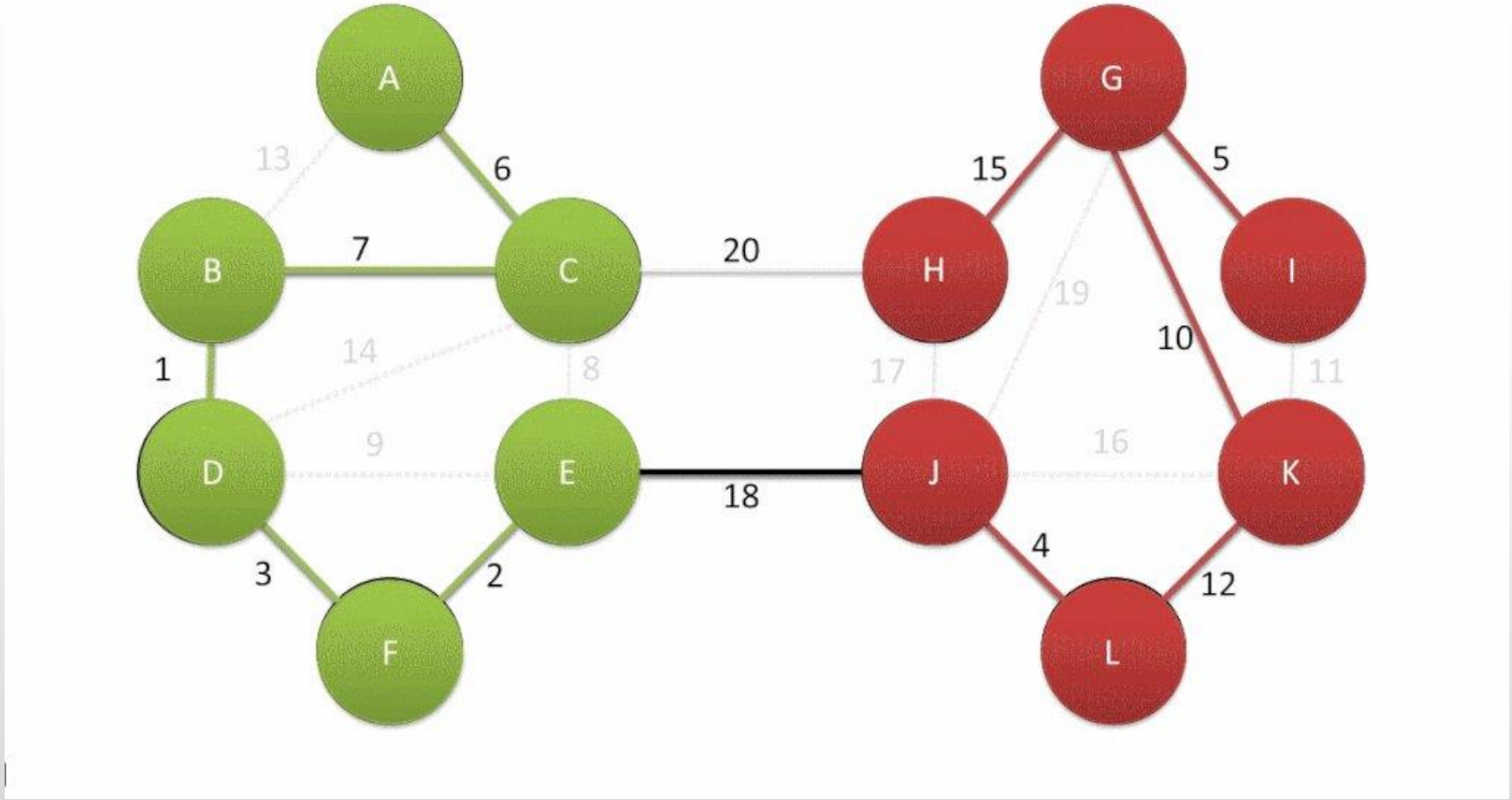

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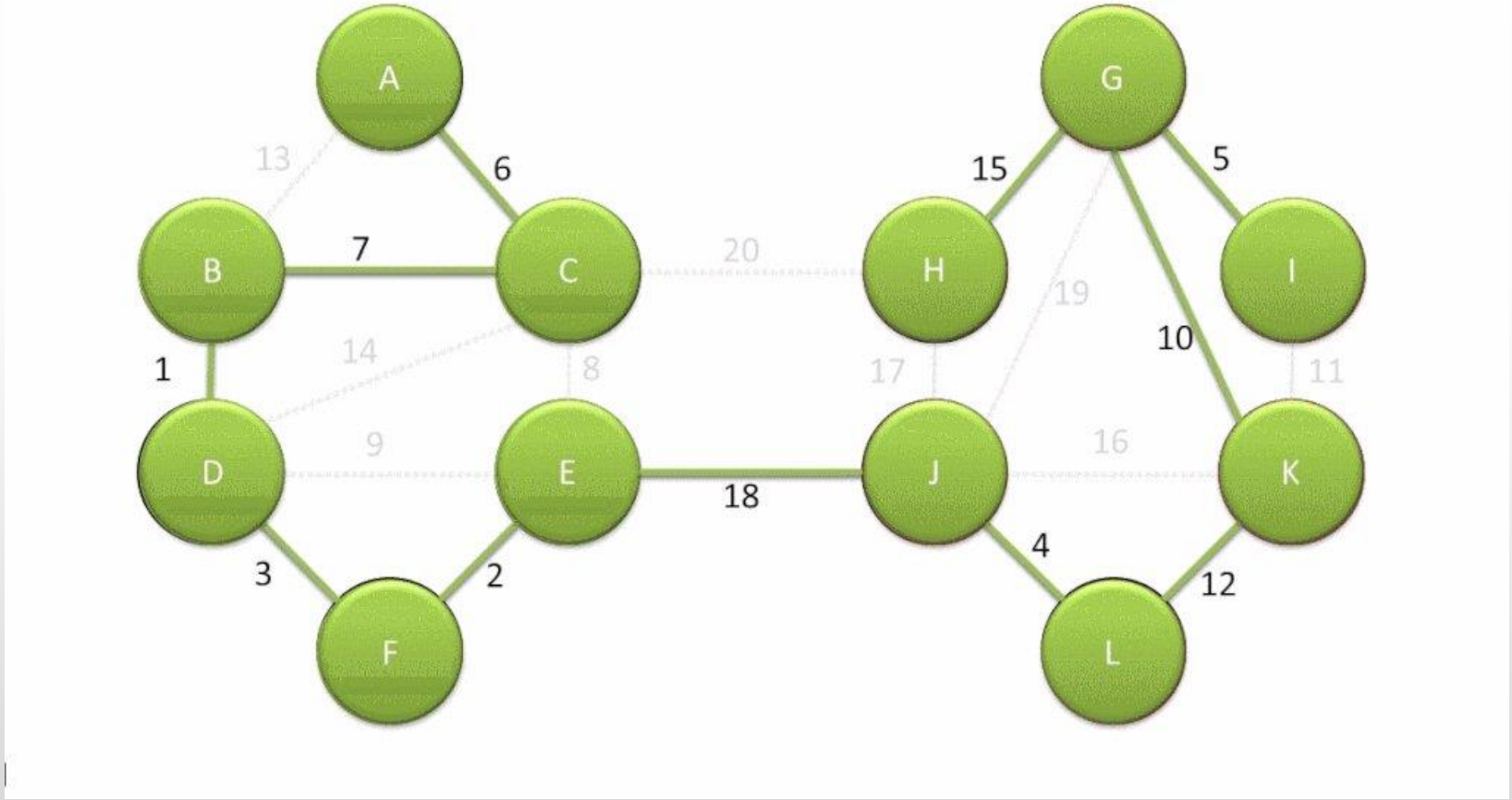


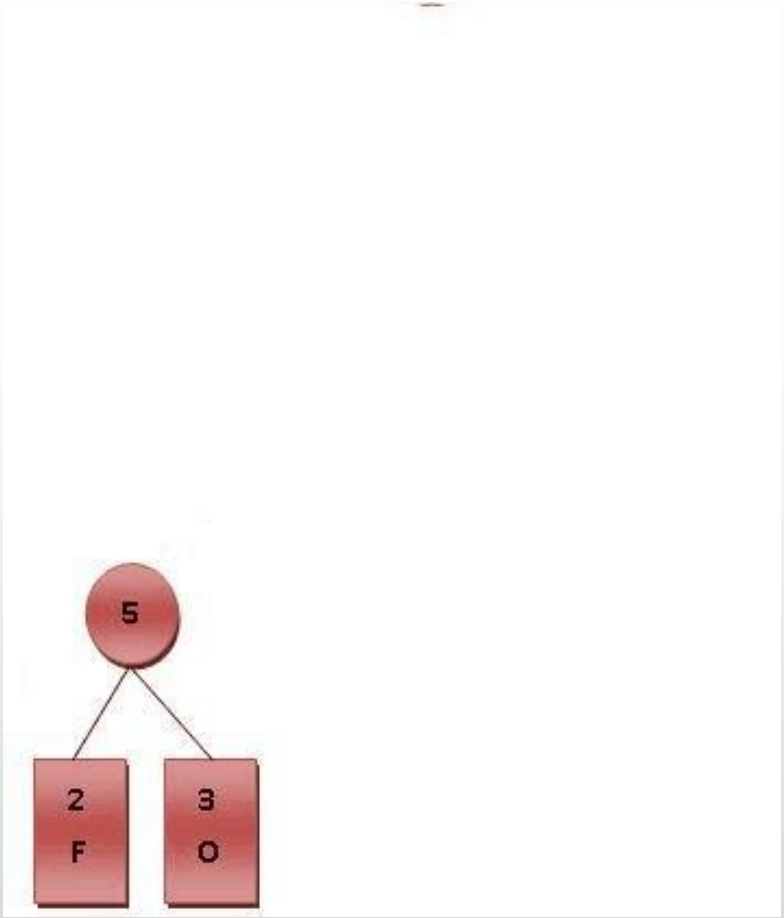
Huffman Kodlama

- Veri sıkıştırma için kullanılır.
- Değişken uzunluklu kodlar kullanır.
- Daha sık kullanılan karakterlere daha kısa kodlar atanır.
- Prefix-free kodlar üretir:
  - Hiçbir kod, başka bir kodun ön eki olamaz.

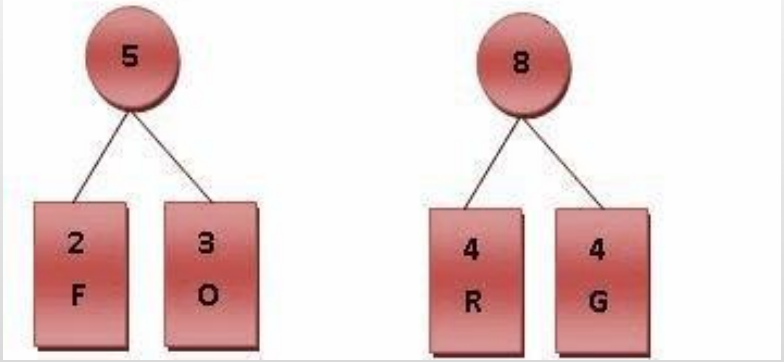
Huffman Kodlama

- Adım 1: Her karakterin frekansı hesaplanır.
- Adım 2: Frekanslara göre bir Huffman ağacı oluşturulur.
- Adım 3: Ağaçtaki her karaktere karşılık gelen kodlar atanır.
- Adım 4: Veri, oluşturulan Huffman kodlarıyla kodlanır.

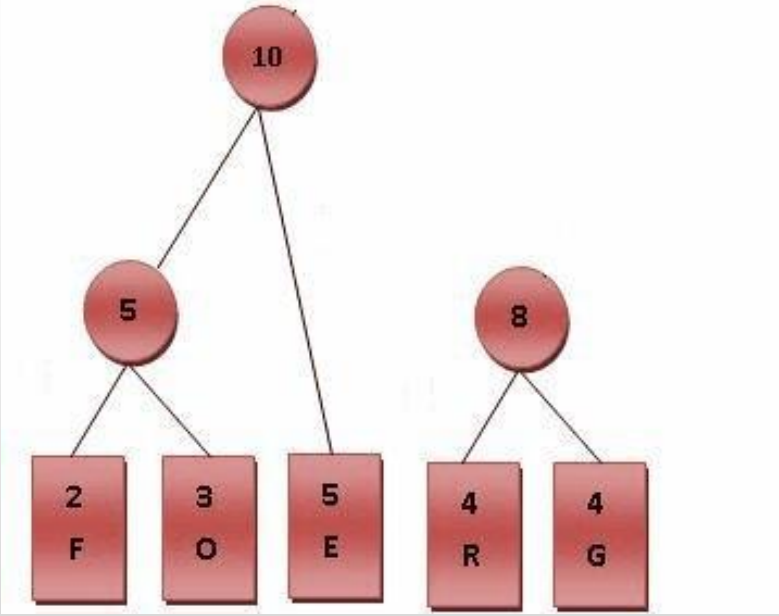
Huffman Coding



Huffman Coding



Huffman Coding



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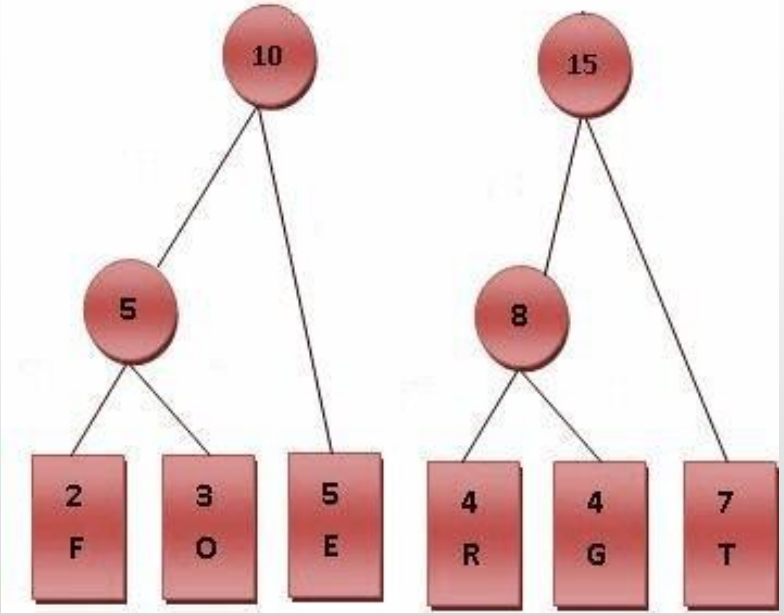

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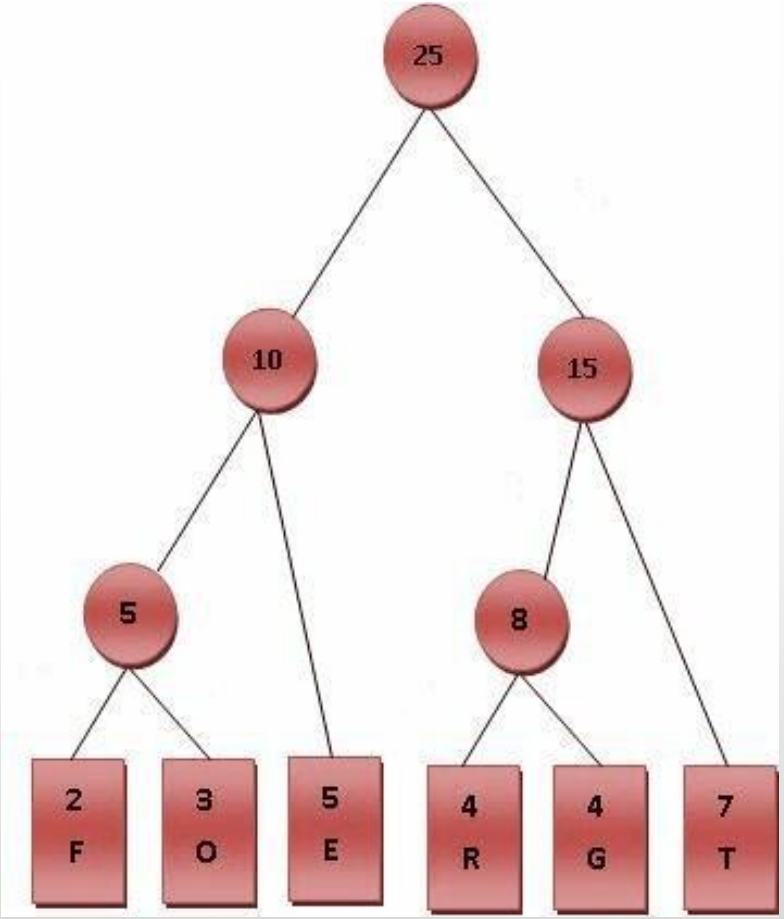

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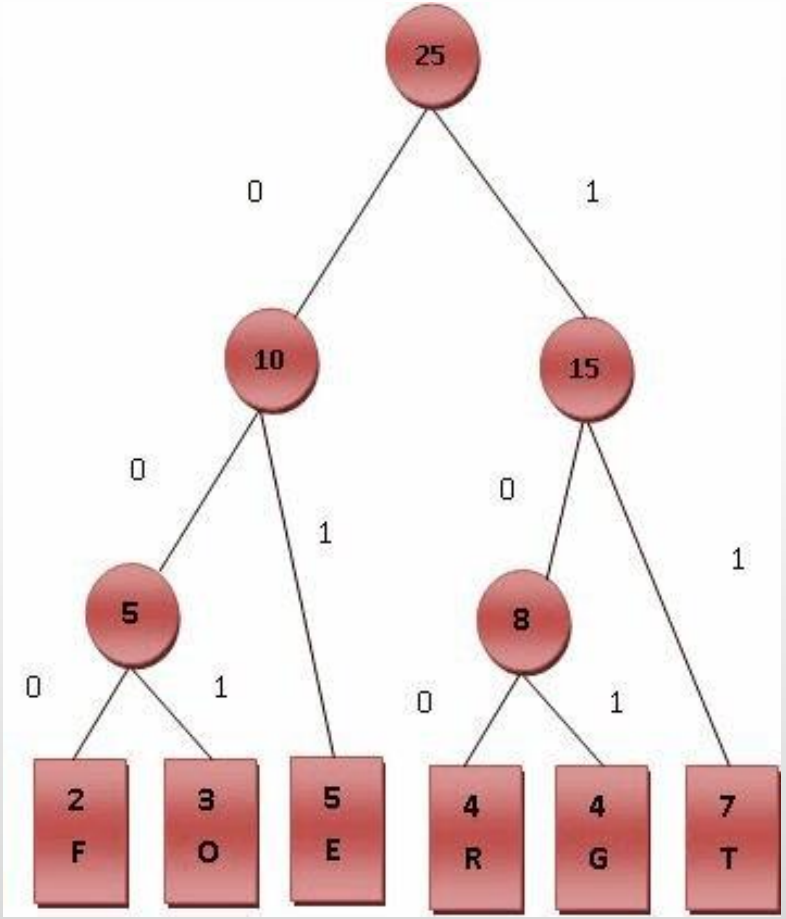

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