Grafos

Componentes Conectados

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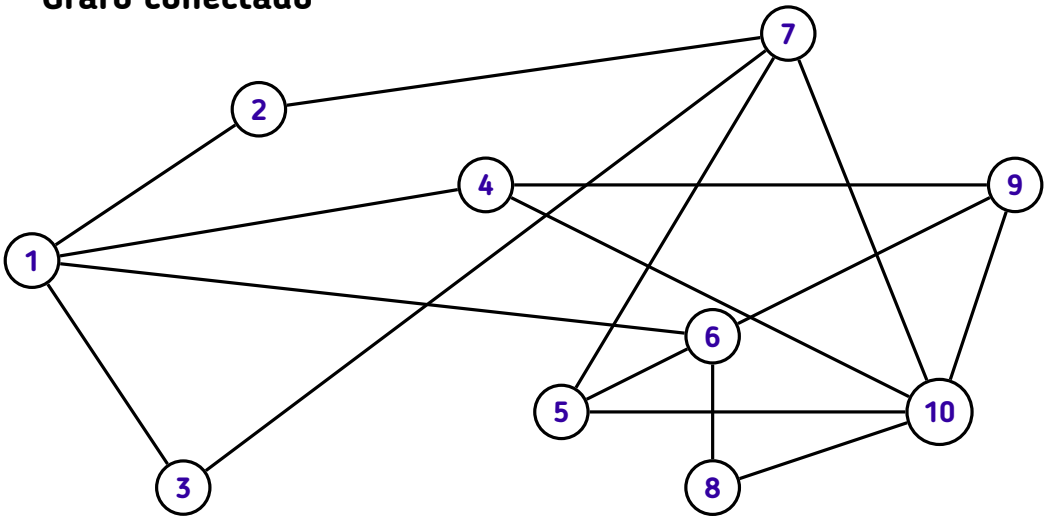
Grafos conectados

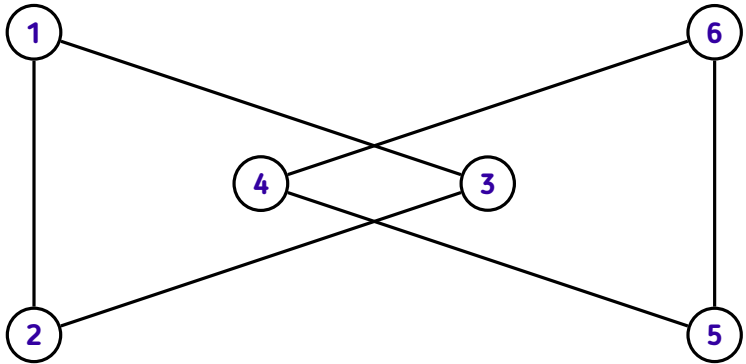
Grafos conectados

Um grafo não-direcionado $G(V, E)$ é dito conectado se, para qualquer par de vértices $u, v \in V$, existe ao menos um caminho de u a v.

Grafo conectado



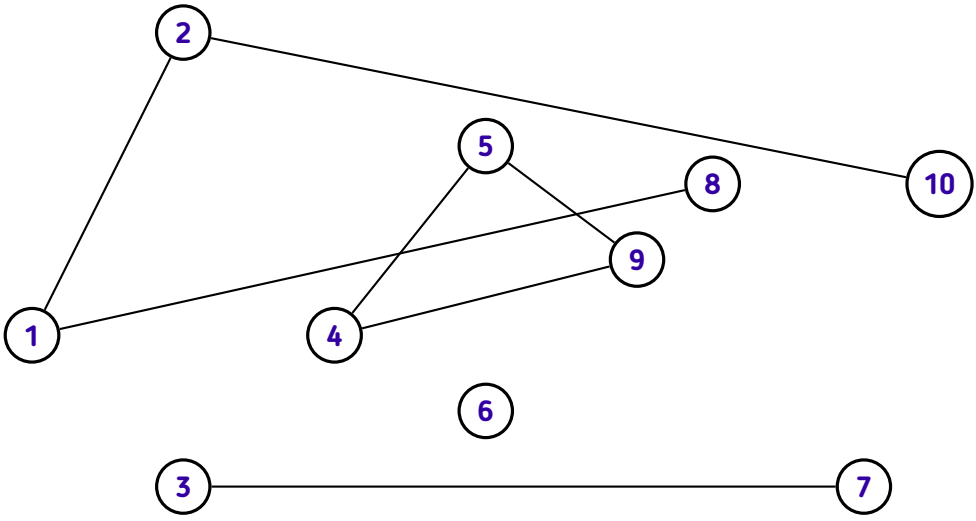
Grafo não-conectado



Componente conectado

Componente conectado

O componente conectado do grafo $G(V, E)$ que contém o vértice u é o maior subgrafo conectado $S(V', E')$ de G tal que $u \in V'$. Os elementos de V' podem ser determinados por meio de uma travessia com início em u.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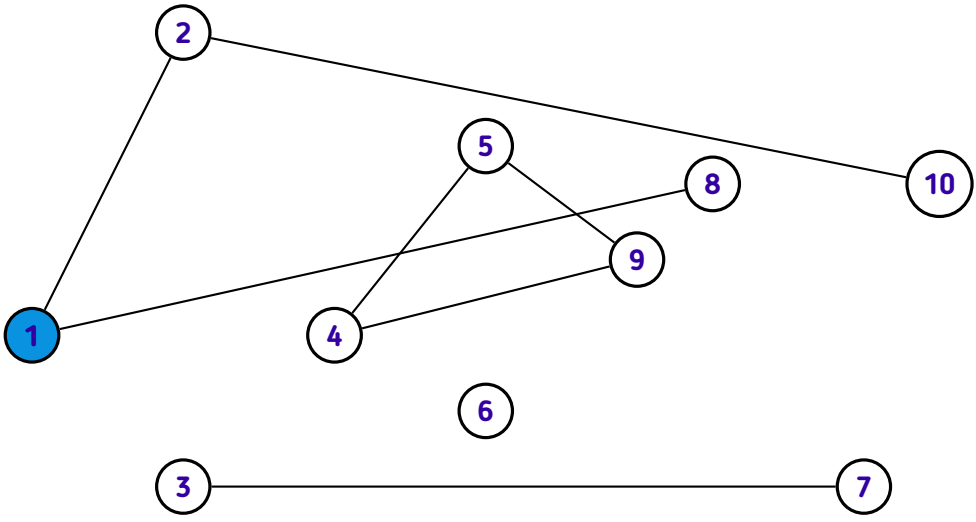
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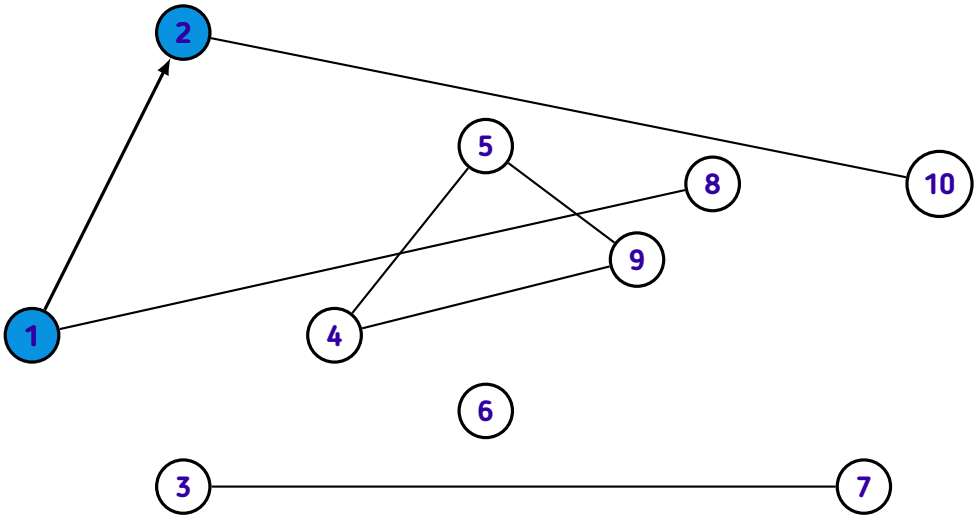
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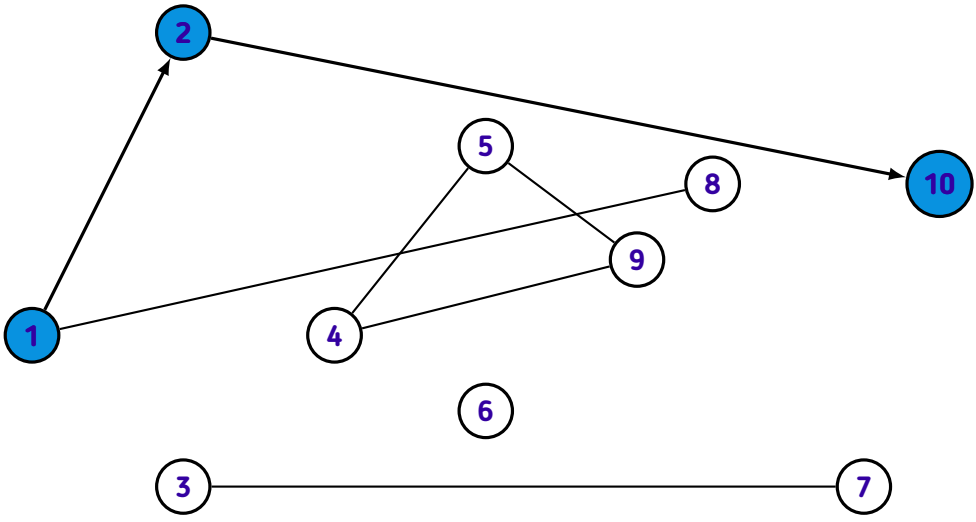
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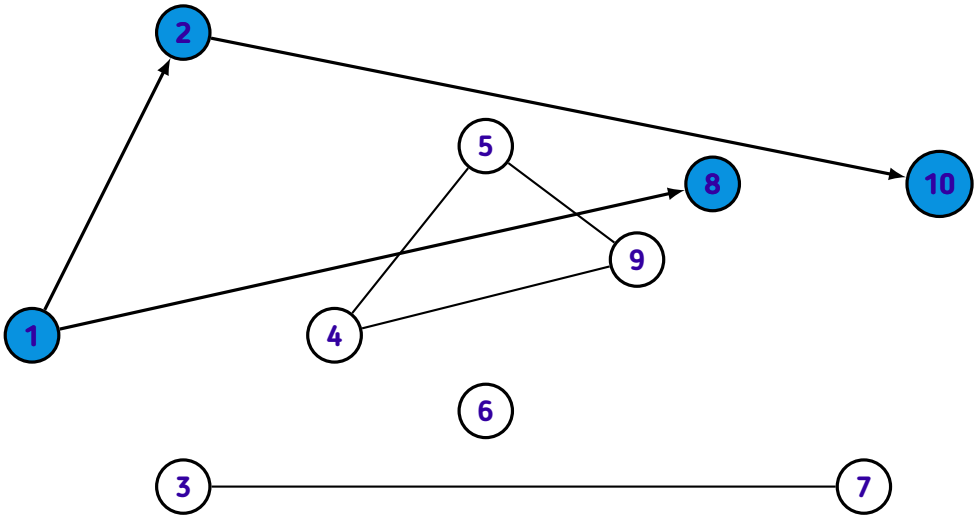
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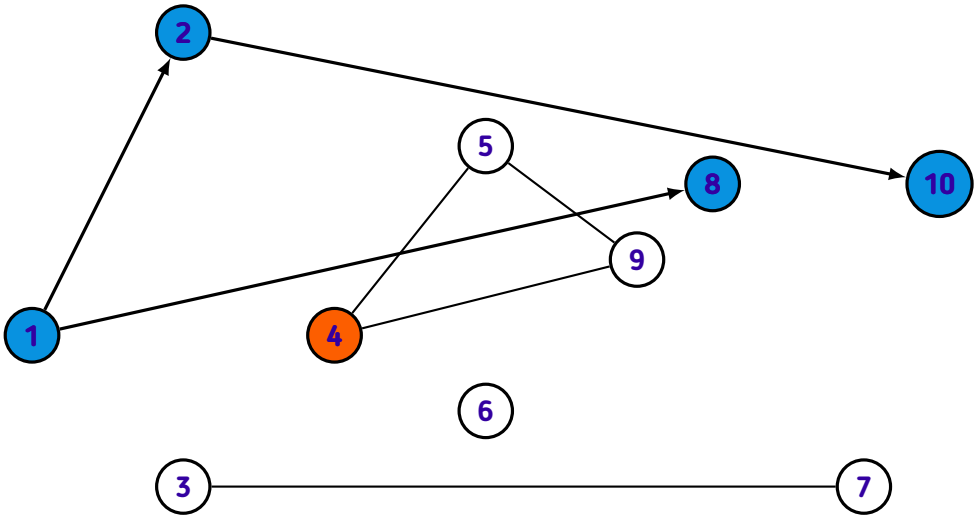
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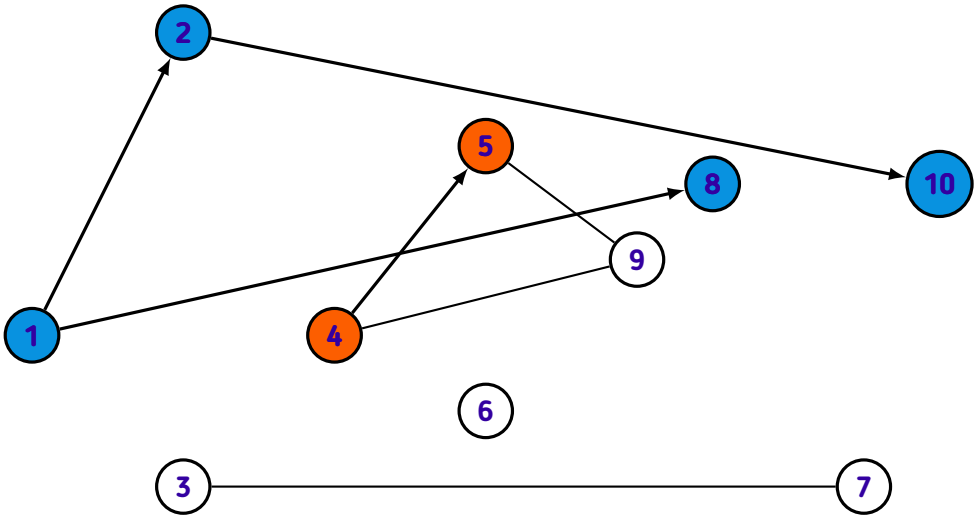
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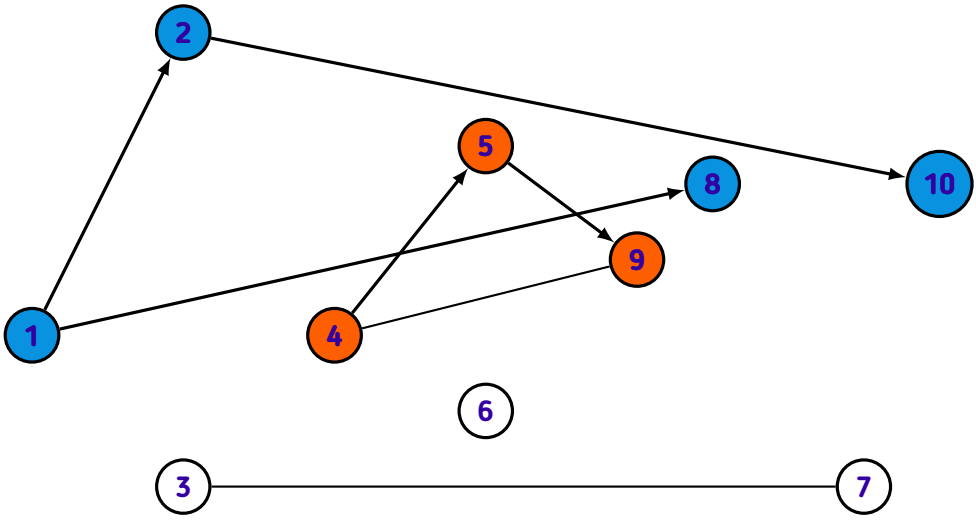
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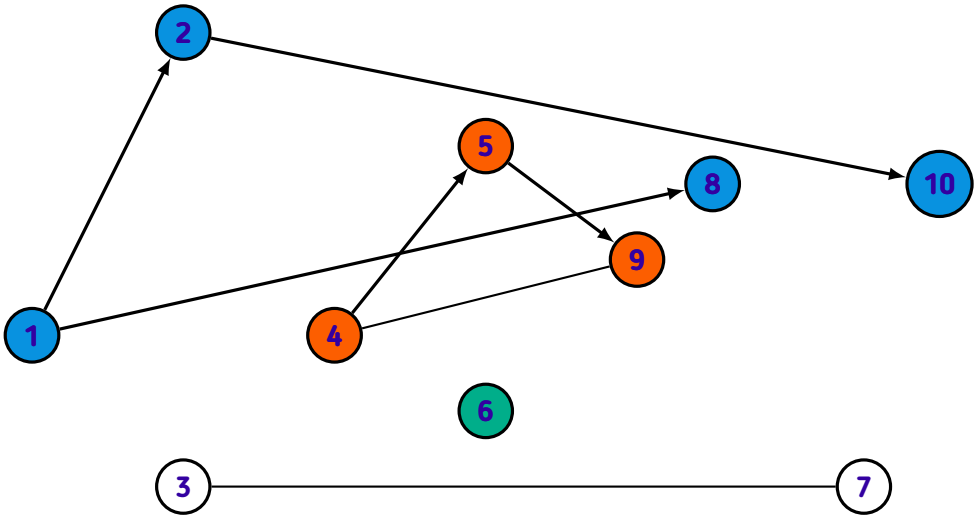
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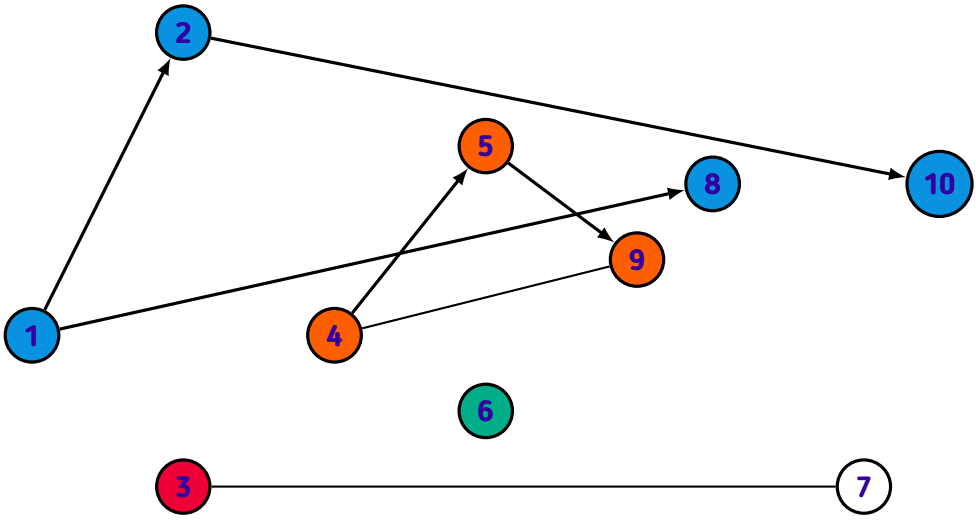
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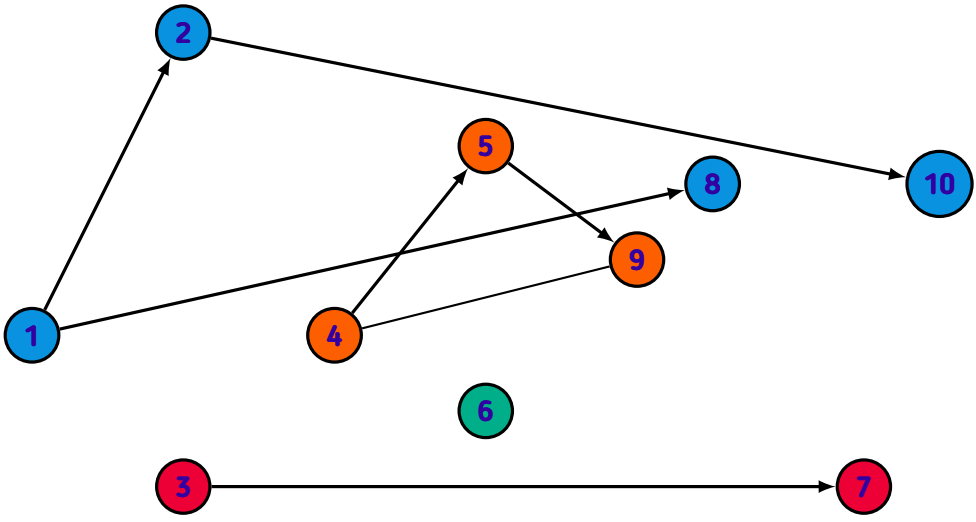
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```
int connected_components(int N)
{
    visited.reset();

    int count = 0;

    for (int u = 1; u <= N; ++u)
    {
        if (not visited[u])
        {
            cout << "Component " << ++count << ":";
            dfs(u);
            cout << '\n';
        }
    }

    return count;
}
```

```cpp
void dfs(int u)
{
    if (visited[u])
        return;

    visited[u] = true;

    cout << ' ' << u;

    for (auto v : adj[u])
        dfs(v);
}
```

Grafos conectados e componentes conectados

Grafos conectados e componentes conectados

Um grafo não-direcionado G é conectado se, e somente se, G tem um único componente conectado.

Problemas sugeridos

1. **AtCoder Beginner Contest 049 – Problem D: Connectivity**
2. **Educational Codeforces Round 5 – Problem C: The Labyrinth**
3. **Educational Codeforces Round 33 (Rated for Div. 2) – Problem C: Rumor**
4. **OJ 11094 – Continents**

Referências

1. **HALIM**, **Felix**; **HALIM**, **Steve**. ***Competitive Programming 3*, 2010.**

2. **LAAKSONEN**, **Antti**. ***Competitive Programmer's Handbook*, 2018.**

3. **SKIENA**, **Steven**; **REVILLA**, **Miguel**. ***Programming Challenges*, 2003.**