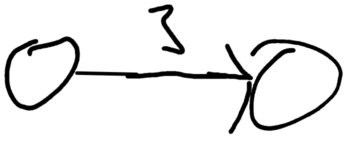
K09 - Omówienia (grafy ważone)

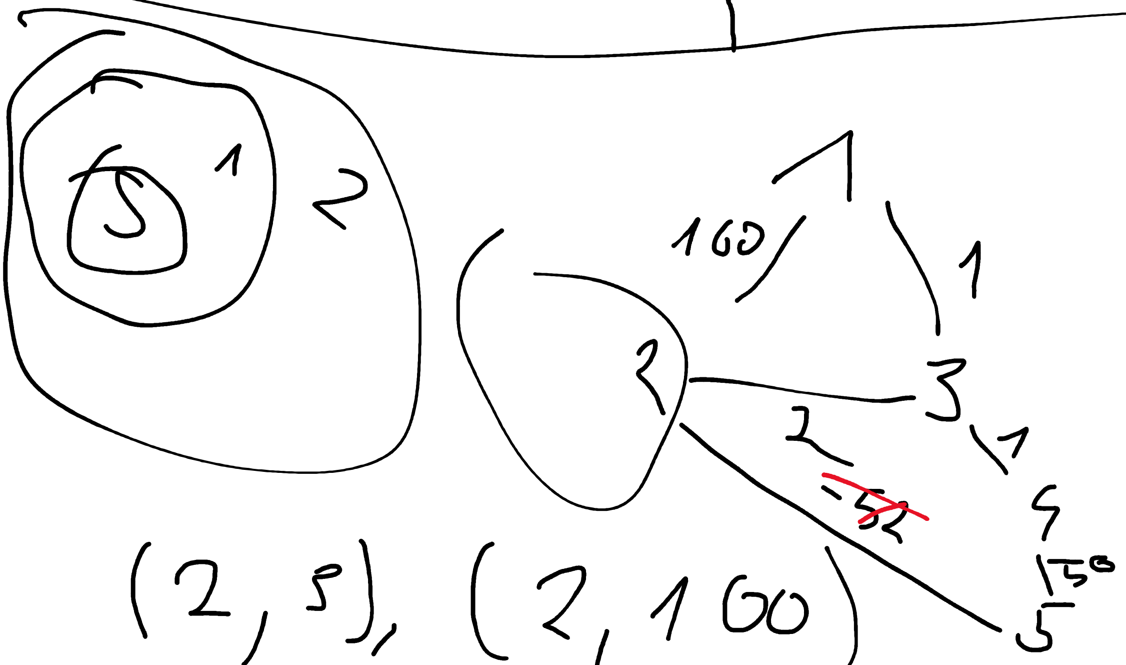
05 January 2024 17:24



nei [a][b] = 1

cost [a][b] = 3

g[a].pB({b, 3})



(2, 5), (2, 100)

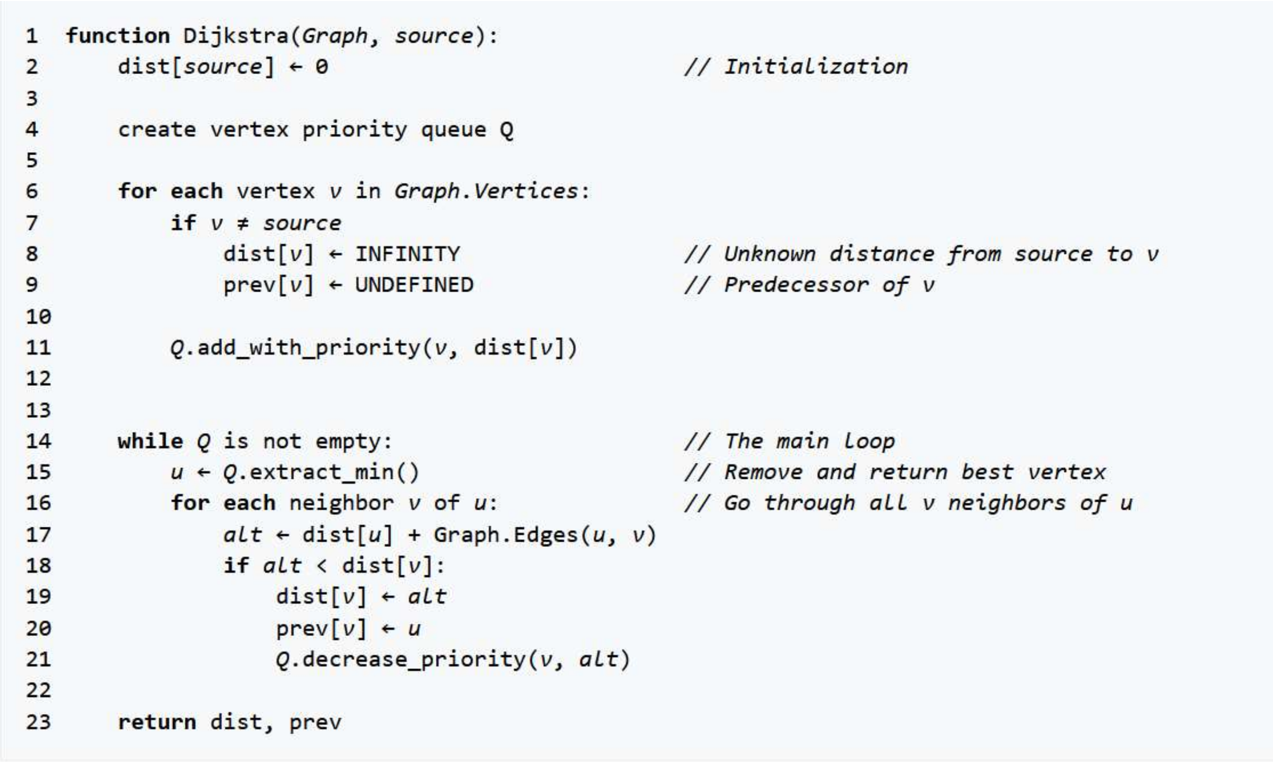
↓

O(E Log V)

p-q<p<i,i>, vec<p<i,i>>, grether<p<i,i>>>

cost node

set<p<i,i>>



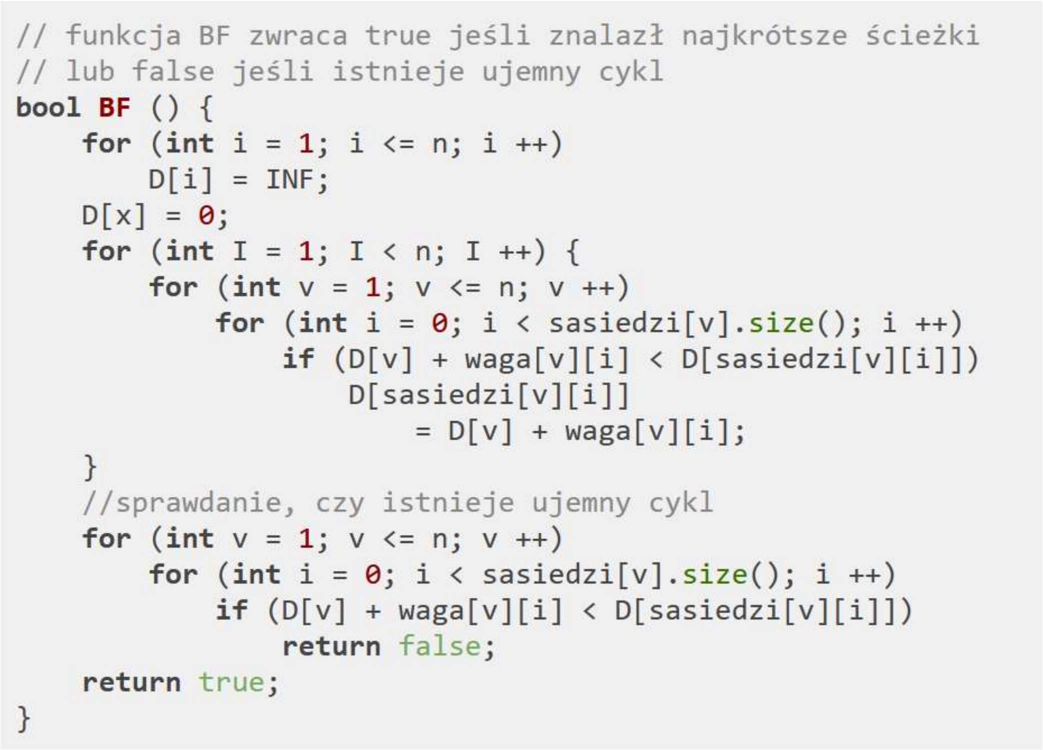
```
function Dijkstra(Graph, source):
    dist[source] ← 0                           // Initialization

    create vertex priority queue Q

    for each vertex v in Graph.Vertices:
        if v ≠ source
            dist[v] ← INFINITY                 // Unknown distance from source to v
            prev[v] ← UNDEFINED                // Predecessor of v

        Q.add_with_priority(v, dist[v])


    while Q is not empty:                      // The main loop
        u ← Q.extract_min()                    // Remove and return best vertex
        for each neighbor v of u:              // Go through all v neighbors of u
            alt ← dist[u] + Graph.Edges(u, v)
            if alt < dist[v]:
                dist[v] ← alt
                prev[v] ← u
                Q.decrease_priority(v, alt)

    return dist, prev
```

BF

I → 1

V-1

1 ~ n



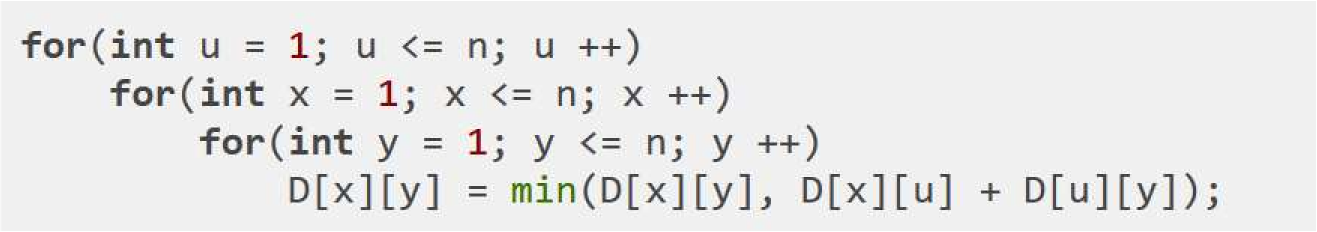
```
// funkcja BF zwraca true jeśli znalazł najkrótsze ścieżki
// lub false jeśli istnieje ujemny cykl
bool BF () {
    for (int i = 1; i <= n; i ++)
        D[i] = INF;
    D[x] = 0;
    for (int I = 1; I < n; I ++) {
        for (int v = 1; v <= n; v ++)
            for (int i = 0; i < sasiedzi[v].size(); i ++)
                if (D[v] + waga[v][i] < D[sasiedzi[v][i]])
                    D[sasiedzi[v][i]]
                        = D[v] + waga[v][i];
    }
    //sprawdanie, czy istnieje ujemny cykl
    for (int v = 1; v <= n; v ++)
        for (int i = 0; i < sasiedzi[v].size(); i ++)
            if (D[v] + waga[v][i] < D[sasiedzi[v][i]])
                return false;
    return true;
}
```

/ d(x, x) = 0 |

$$\boxed{\begin{array}{l} d(x,x) = 0 \\ d(x,y) = d(y,x) \end{array}}$$

$d(a,b) \leq d(a,c) + d(c,b)$

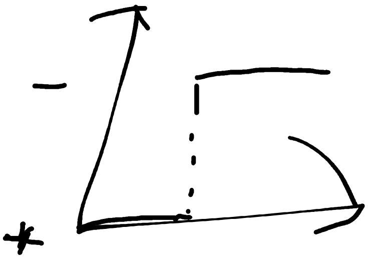
dp[a][b]



```
for(int u = 1; u <= n; u ++)
    for(int x = 1; x <= n; x ++)
        for(int y = 1; y <= n; y ++)
            D[x][y] = min(D[x][y], D[x][u] + D[u][y]);
```

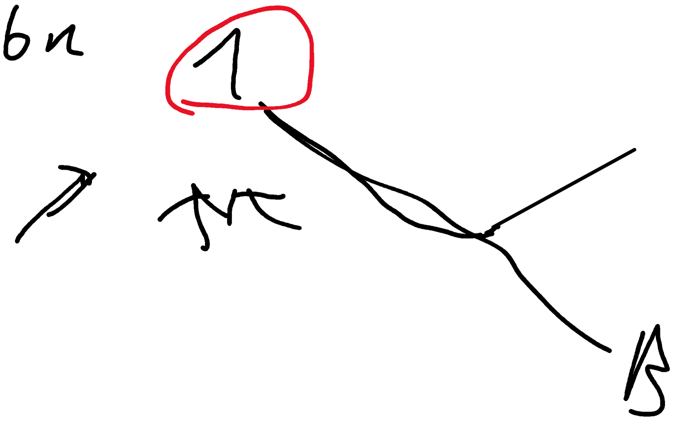
min (d[x][x]) $O(n^3)$

$-C$



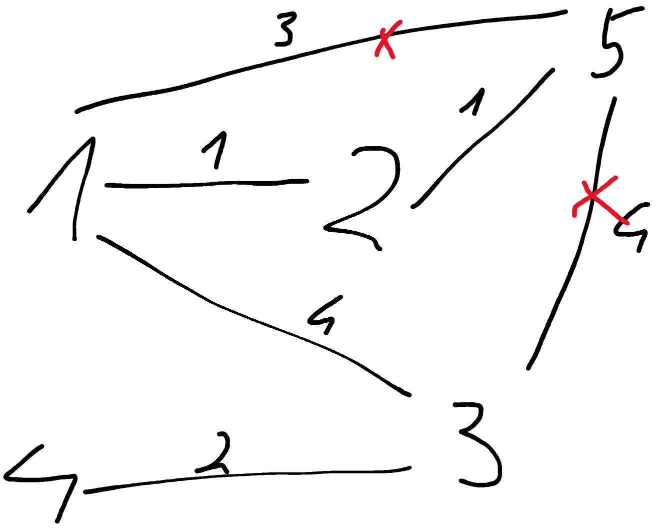
$O(|V||E| \cdot \log n)$

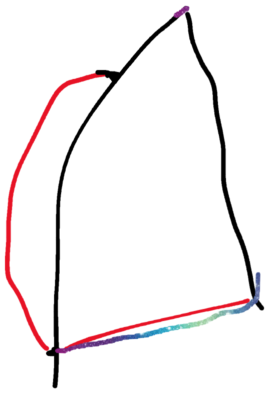
Bubn



Bellman Ford — spr ujemny, wypisz odl

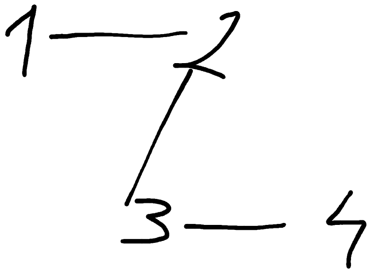
Naj cykl - FU   d[a][a]





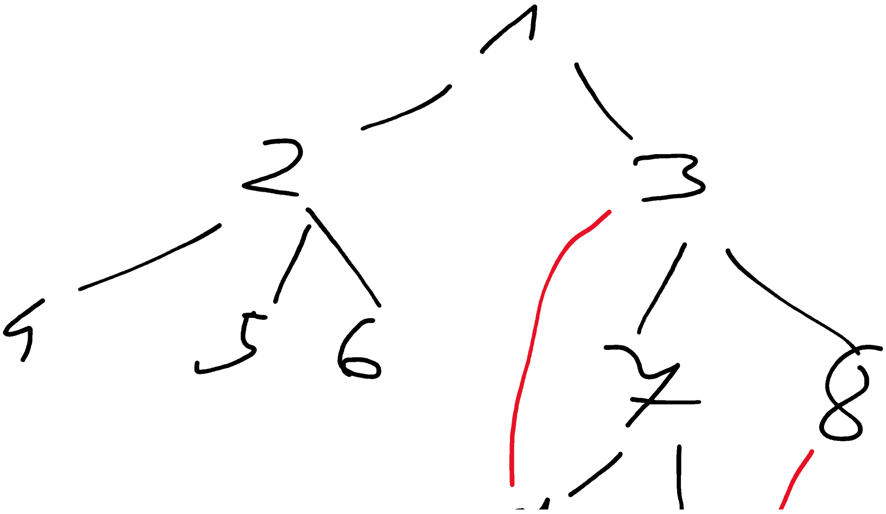
$O(E \log E)$

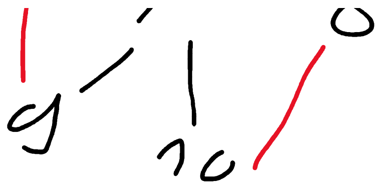
F U



MST - odpal Kruskala

Nawatnica





$O(E \log E + V \log V + E \log V)$

Cg41

$$A = \frac{\sum a_i}{n} = \frac{a_1+a_2+\dots+a_n}{n}$$

$$nA = \sum a_i$$

$$\sum a_i - nA = 0$$

$$a_1 + \dots + a_n - nA = 0$$

$$a_1 - A + a_2 - A + \dots + a_n - A = 0$$

$$\sum a_i - A = 0$$

```
while [ abs(R-L) > eps)
while( ct-- > 0)
```

$\boxed{ct = 50}$