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Prac-1 : Operations on Graphs

```cpp
#include <bits/stdc++.h>
using namespace std;

vector<int> generate_prufer_sequence(int v, int e, int edge[][2], int degree[])
{
    int min, pendent;
    vector<int> prufer(v-2);
    for(int i = 0; i < v-2; i++)
    {
        min = 99999;
        for(int j = 0; j < e; j++)
        {
            if(degree[edge[j][0]] == 1)
            {
                if(edge[j][0] < min)
                {
                    min = edge[j][0];
                    pendent = j;
                }
            }
            if(degree[edge[j][1]] == 1)
            {
                if(min > edge[j][1])
                {
                    min = edge[j][1];
                    pendent = j;
                }
            }
        }

        // Decrement the degree of pendent vertex & vertex adjecent to it.
        degree[edge[pendent][0]]--;
        degree[edge[pendent][1]]--;

        if(degree[edge[pendent][0]] == 0)
            prufer[i] = edge[pendent][1];
        else
            prufer[i] = edge[pendent][0];
    }
    return prufer;
}
```

```
int main()
{
    int v, e;
    cout<<"\nEnter the number of vertexes of the spanning tree: ";
    cin>>v;

    e = v-1;
    int edge[e][2], degree[v+1] = {0};

    cout<<"\nFor "<<v<<" vertexes this spanning tree must have exactly "<<e<<"
edges.";
    cout<<"\nEnter "<<e<<" edges for the spanning tree.\n";
    for(int i = 0; i < e; i++)
    {
        cin>>edge[i][0];
        cin>>edge[i][1];

        degree[edge[i][0]]++;
        degree[edge[i][1]]++;
    }

    vector<int> prufer_seq = generate_prufer_sequence(v, e, edge, degree);

    cout << "\nThe Prufer sequence for the spanning tree is: (";
    for(auto p : prufer_seq)
    {
        cout << ' ' << p;
    }
    cout << " )\n\n";



    return 0;
}
```

OUTPUT :

```
Enter the number of vertexes of the spanning tree: 7

For 7 vertexes this spanning tree must have exactly 6 edges.
Enter 6 edges for the spanning tree.
1 7
1 2
1 6
3 7
4 6
5 6
The Prufer sequence for the spanning tree is: ( 1 7 6 6 1 )

Enter the number of vertexes of the spanning tree: 8
```

```
For 8 vertexes this spanning tree must have exactly 7 edges.
Enter 7 edges for the spanning tree.
1 2
1 6
1 7
3 6
4 6
4 8
5 6

The Prufer sequence for the spanning tree is: ( 1 6 6 1 2 4 )
```