

Олимпиада СПбГУ по информатике 2020/21 учебного года

A	B	C	D	E	F	Sum
100	100	100	100	35	0	435

Task A ()

```
k = int(input())
if k <= 9:
    print(k)
else:
    k -= 10
    k %= 9
    if k == 0:
        print(0)
    else:
        print(k + 1)
```

Task B ()

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

int main()
{
    int n, k;
    cin >> n >> k;
    vector<int> mas(26, 1);
    string s;
    cin >> s;
    int good = 0;
    int ans = 0;
    int len = 0;
    for (auto i : s)
    {
        len++;
        if (good + mas[i - 'a'] > 3 || len > k)
        {
            ans++;
            good = 1;
            mas.assign(26, 1);
            mas[i - 'a'] = 0;
            len = 1;
        }
        else
        {
            good += mas[i - 'a'];
            mas[i - 'a'] = 0;
        }
    }
    ans++;
    cout << ans;
}
```

Task C ()

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

int main()
{
    ios_base::sync_with_stdio(0); cin.tie(0); cout.tie(0);
    int n, x, y;
    cin >> n >> x >> y;
    int v[n], w[n];
    int sumw = 0;
    for (int i = 0; i < n; i++)
        cin >> v[i];
    for (int i = 0; i < n; i++)
    {
        cin >> w[i];
        sumw += w[i];
    }
    vector<vector<int>> dp(n + 1, vector<int>(x + 1, -1));
    for (int i = 0; i < n; i++)
        dp[i][0] = 0;
    int mx = 0;
    int id = 0;
    for (int i = 1; i <= n; i++)
    {
        for (int j = 1; j <= x; j++)
        {
            if (j - v[i - 1] >= 0 && dp[i - 1][j - v[i - 1]] != -1)
            {
                dp[i][j] = max(dp[i - 1][j], dp[i - 1][j - v[i - 1]] + w[i - 1]);
            }
            else
            {
                dp[i][j] = dp[i - 1][j];
            }
            if (i == n && dp[i][j] > mx)
            {
                mx = dp[i][j];
                id = j;
            }
        }
    }
    /*for (int i = 1; i <= n; i++)
    {
        for (int j = 1; j <= x; j++)
        {
            cout << dp[i][j] << ' ';
        }
        cout << '\n';
    }*/
    if (sumw - mx > y)
        cout << -1;
    else
    {
        if (n == 1)
        {
            if (v[0] <= x)
                cout << 'x';
            else
                cout << 'y';
            return 0;
        }
        vector<char> ans(n, 'y');
        int i = n;
        while (i > 0)
        {
            if (dp[i - 1][id] == dp[i][id])
                i--;
            else
            {
                ans[i - 1] = 'x';
                id -= v[i - 1];
                i--;
            }
        }
    }
}
```

```
        }  
    }  
    for (char c : ans)  
        cout << c;  
}
```

Task D ()

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

int main()
{
    ios_base::sync_with_stdio(0); cin.tie(0); cout.tie(0);
    int n;
    cin >> n;
    string s;
    cin >> s;
    for (int i = 0; i < s.size(); i++)
    {
        if (s[i] == '(' || s[i] == ')')
            s[i] = '1';
        else
            s[i] = '2';
    }
    string t;
    for (char c : s)
    {
        if (t.size() > 0 && t.back() == c)
            t.pop_back();
        else
            t += c;
    }
    cout << t.size() / 2;
}
```

Task E ()

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

int main()
{
    ios_base::sync_with_stdio(0); cin.tie(0); cout.tie(0);
    string s;
    cin >> s;
    int t;
    cin >> t;
    set<set<int>> mas;
    for (int _ = 0; _ < t; _++)
    {
        int n, k;
        cin >> n >> k;
        int dp[10][10][10];
        for (int i = 0; i < 10; i++)
        {
            for (int j = i+1; j < 10; j++)
            {
                for (int z = j+1; z < 10; z++)
                {
                    for (int a = 0; a < 10; a++)
                    {
                        if (a != i && a != j && a != z)
                        {
                            set<int> st = {i, j, z, a};
                            if (mas.find(st) == mas.end())
                            {
                                dp[i][j][z] = a;
                                dp[i][z][j] = a;
                                dp[j][i][z] = a;
                                dp[j][z][i] = a;
                                dp[z][i][j] = a;
                                dp[z][j][i] = a;
                                mas.insert(st);
                                break;
                            }
                        }
                    }
                }
            }
        }
        if (s == "add")
        {
            int a, b, c;
            cin >> a >> b >> c;
            a--; b--; c--;
            cout << dp[a][b][c] + 1;
            cout << '\n';
        }
        else
        {
            int a, b, c, d;
            cin >> a >> b >> c >> d;
            a--; b--; c--; d--;
            if (dp[a][b][c] == d)
                cout << a + 1 << ' ' << b + 1 << ' ' << c + 1;
            else if (dp[a][c][d] == b)
                cout << a + 1 << ' ' << c + 1 << ' ' << d + 1;
            else if (dp[a][b][d] == c)
                cout << a + 1 << ' ' << b + 1 << ' ' << d + 1;
            else if (dp[b][c][d] == a)
                cout << b + 1 << ' ' << c + 1 << ' ' << d + 1;
            cout << '\n';
        }
    }
}
```

Task F ()