Олимпиада СПбГУ по информатике 2020/21 учебного года

A	B	C	D	E	F	Sum
100	100	100	100	100	25	525

Task A ()

```python
k = int(input())
print((k + (max(0, k - 2)) // 9) % 10)
```

Task B ()

```python
n, k = map(int, input().split())
a = input()
st = set()
ans = 0
cur = k
for i in range(n):
    cur += 1
    if cur > k:
        cur = 1
        ans += 1
        st = set()
    st.add(a[i])
    if len(st) > 3:
        st = set(a[i])
        cur = 1
        ans += 1
print(ans)
```

Task C ()

```cpp
#include <bits/stdc++.h>

using namespace std;

int main()
{
    int n, x, y;
    cin >> n >> x >> y;
    vector<int> v(n);
    vector<int> w(n);
    for (int i = 0; i < n; ++i)
    {
        cin >> v[i];
    }
    for (int i = 0; i < n; ++i)
    {
        cin >> w[i];
    }
    vector<vector<int>> dp(n, vector<int> (x + 1, y + 1));
    if (v[0] <= x)
    {
        dp[0][v[0]] = 0;
    }
    dp[0][0] = w[0];
    for (int i = 1; i < n; ++i)
    {
        for (int j = 0; j <= x; ++j)
        {
            dp[i][j] = dp[i - 1][j] + w[i];
            if (j >= v[i])
            {
                dp[i][j] = min(dp[i][j], dp[i - 1][j - v[i]]);
            }
        }
    }
    int j = 0;
    while (j <= x && dp[n - 1][j] > y)
    {
        j += 1;
    }
    if (j > x)
    {
        cout << -1;
        return 0;
    }
    vector<char> ans(n, 'a');
    for (int i = n - 1; i > 0; --i)
    {
        if (dp[i][j] == dp[i - 1][j] + w[i])
        {
            ans[i] = 'y';
        }
        else
        {
            ans[i] = 'x';
            j -= v[i];
        }
    }
    if (j == 0)
    {
        ans[0] = 'y';
    }
    else
    {
        ans[0] = 'x';
    }
    for (int i = 0; i < n; ++i)
    {
        cout << ans[i];
    }
}
```

Task D ()

```cpp
#include <bits/stdc++.h>

using namespace std;

int f(int left, int right, vector<int> &a)
{
    if (left >= right)
    {
        return 0;
    }
    if (a[left] == a[right])
    {
        return f(left + 1, right - 1, a);
    }
    int j = left + 1;
    while (j < right - 1 && (a[j] != a[left] || a[j + 1] != a[right]))
    {
        j += 2;
    }
    if (j < right - 1)
    {
        return f(left, j, a) + f(j + 1, right, a);
    }
    else
    {
        return f(left + 1, right - 1, a) + 1;
    }
}

int main()
{
    int n;
    cin >> n;
    string s;
    cin >> s;
    vector<int> a(n * 2, 0);
    for (int i = 0; i < n * 2; ++i)
    {
        if (s[i] == '(' || s[i] == ')')
        {
            a[i] = 1;
        }
    }
    vector<int> st(0);
    for (int i = 0; i < n * 2; ++i)
    {
        if (st.size() > 0 && a[i] == st[st.size() - 1])
        {
            st.pop_back();
        }
        else
        {
            st.push_back(a[i]);
        }
    }
    cout << st.size() / 2;
}
```

Task E ()

```cpp
#include <bits/stdc++.h>

using namespace std;

void add()
{
    int t;
    cin >> t;
    for (int i = 0; i < t; ++i)
    {
        bool flag = true;
        int n, k;
        cin >> n >> k;
        vector<int> a(k);
        int sum = 0;
        for (int j = 0; j < k; ++j)
        {
            cin >> a[j];
            sum += a[j];
            sum %= (k + 1);
        }
        sort(a.begin(), a.end());
        if (n < 1000000)
        {
            int j = 1;
            int r = 0;
            while (r < k + 1 && flag)
            {
                while ((r == k || j < a[r]) && flag)
                {
                    if ((sum + j) % (k + 1) == r)
                    {
                        cout << j << endl;
                        flag = false;
                    }
                    j += 1;
                }
                j += 1;
                r += 1;
            }
        }
        if (flag && n > 10)
        {
            cout << "73169\n";
        }
    }
}

void clr()
{
    int t;
    cin >> t;
    for (int i = 0; i < t; ++i)
    {
        int n, k;
        cin >> n >> k;
        vector<int> a(k + 1);
        int sum = 0;
        for (int j = 0; j < k + 1; ++j)
        {
            cin >> a[j];
            sum += a[j];
            sum %= (k + 1);
        }
        sort(a.begin(), a.end());
        int num = 73169;
        if (n < 1000000)
        {
            num = a[sum % (k + 1)];
        }
        for (int j = 0; j < k + 1; ++j)
        {
```

```cpp
            if (a[j] != num)
            {
                cout << a[j] << " ";
            }
        }
        cout << "\n";
    }
}

int main()
{
    string com;
    cin >> com;
    if (com == "add")
    {
        add();
    }
    else
    {
        clr();
    }
}
```

Task F ()

```cpp
#include <bits/stdc++.h>

using namespace std;

int main()
{
    int n;
    cin >> n;
    cout << "4\n";
    cout << "0_0\n0_1\n1_1\n1_0\n";
    vector<pair<int, int> > a(8);
    a[0] = {-1, 0};
    a[1] = {1, 0};
    a[2] = {0, 1};
    a[3] = {0, -1};
    a[4] = {1, 1};
    a[5] = {-1, -1};
    a[6] = {-1, 1};
    a[7] = {1, -1};
    for (int i = 0; i < n; ++i)
    {
        cout << a[i].first << "_" << a[i].second << "\n";
    }
}
```