

Олимпиада «Ломоносов» по информатике. 2022-2023 учебный год
Работа участника с логином inf23f_110
Прайморадичная система счисления
Посылка по задаче 1 «Прайморадичная система счисления»

```
#ifndef _GLIBCXX_NO_ASSERT
#include <cassert>
#endif
#include <cctype>
#include <cerrno>
#include <cfloat>
#include <ciso646>
#include <climits>
#include <locale>
#include <cmath>
#include <setjmp>
#include <signal>
#include <stdarg>
#include <stddef>
#include <stdio>
#include <stdlib>
#include <string>
#include <time>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <complex>
#include <cfenv>
#include <inttypes>
#include <stdalign>
#include <stdbool>
#include <stdint>
#include <tgmath>
#include <wchar>
#include <wctype>
#endif

// C++
#include <algorithm>
#include <bitset>
#include <complex>
#include <deque>
#include <exception>
#include <fstream>
#include <functional>
```

```
#include <iomanip>
#include <ios>
#include <iosfwd>
#include <iostream>
#include <istream>
#include <iterator>
#include <limits>
#include <list>
#include <locale>
#include <map>
#include <memory>
#include <new>
#include <numeric>
#include <ostream>
#include <queue>
#include <set>
#include <sstream>
#include <stack>
#include <stdexcept>
#include <streambuf>
#include <string>
#include <typeinfo>
#include <utility>
#include <valarray>
#include <vector>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <array>
#include <atomic>
#include <chrono>
#include <condition_variable>
#include <forward_list>
#include <future>
#include <initializer_list>
#include <mutex>
#include <random>
#include <ratio>
#include <regex>
#include <scoped_allocator>
#include <system_error>
#include <thread>
#include <tuple>
#include <typeindex>
#include <type_traits>
```

```

#include <unordered_map>
#include <unordered_set>
#endif

using namespace std;

#define fi first
#define se second
#define be(x) x.begin()
#define en(x) x.end()
#define all(a) be(a),en(a)
#define for0(i,n) for(int i=0;i<n;i++)
#define for1(i,n) for(int i=1;i<n;i++)
#define ret return
#define con continue
#define sz(x) x.size()

typedef long long ll;
typedef vector<ll> vll;
typedef pair<ll, ll> pll;
typedef set<ll> sll;
typedef vector<vll> vvll;
typedef vector<pll> vppll;
typedef string str;

#ifdef OG_Matveychick1
bool local = 1;
#else
bool local = 0;
#endif

void solve();
int main()
{
    if (local)
    {
        freopen("input.txt", "r", stdin);
        freopen("output.txt", "w", stdout);
    }
    ll t = 1;
    //cin>>t;
    while (t--)
    {

```

```

        solve();
    }
}

void solve()
{
    ll n;
    cin >> n;
    ll mx = -1;
    str smx = "";
    bool f = 0;
    vector<string> vs;
    vll b(n);
    vll p(n);
    pll ans = { -1,0 };
    for0(i, n)
    {
        str s;
        cin >> s;
        vs.push_back(s);
        reverse(all(s));
        replace(all(s), ':', ' ');
        stringstream sin(s);
        ll cnt = -1;
        ll x;
        ll it = 0;
        while (sin >> x)
        {
            if (cnt == -1 && x != 0)
            {
                cnt = it;
            }
            it++;
        }
        if (cnt == -1)
        {
            f = 1;
        }
        else if (cnt > mx)
        {
            mx = cnt;
            ans = { i,1 };
        }
        p[i] = cnt;
    }
}

```

```

reverse(all(s));
stringstream sin1(s);
while (sin1 >> x)
{
    b[i].push_back(x);
}
while (sz(b[i]) != 25)
{
    b[i].insert(be(b[i]), 0);
}
}
if (f)
{
    ll cn = 0;
    for0(i, n)
    {
        if (p[i] == -1)
        {
            cn++;
        }
    }
    cout << cn;
    ret;
}
for0(i, n)
{
    ll uk = 0;
    for0(j, 25)
    {
        if (b[i][j] != b[ans.fi][j])
        {
            if (b[i][j] > b[i][ans.first])
            {
                uk = 1;
            }
            else
            {
                uk = 2;
            }
            break;
        }
    }
    if (uk == 0)
    {

```

```

        ans.second++;
    }
    if (uk == 1)
    {
        ans = { i,1 };
    }
}
cout << ans.second - 1;
}

```

Протокол проверяющей системы по задаче 1 «Прайморадичная система счисления»

см. файл report1.txt

Посылка по задаче 2 «Сундуки»

```

#ifndef _GLIBCXX_NO_ASSERT
#include <cassert>
#endif
#include <cctype>
#include <cerrno>
#include <cfloat>
#include <ciso646>
#include <climits>
#include <locale>
#include <cmath>
#include <csetjmp>
#include <csignal>
#include <cstdarg>
#include <cstddef>
#include <cstdio>
#include <cstdlib>
#include <cstring>
#include <ctime>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <complex>
#include <cfenv>
#include <cinttypes>
#include <cstdalign>
#include <cstdbool>
#include <cstdint>
#include <ctgmath>
#include <cwchar>
#include <cwctype>
#endif

```

```
// C++
#include <algorithm>
#include <bitset>
#include <complex>
#include <deque>
#include <exception>
#include <fstream>
#include <functional>
#include <iomanip>
#include <ios>
#include <iosfwd>
#include <iostream>
#include <istream>
#include <iterator>
#include <limits>
#include <list>
#include <locale>
#include <map>
#include <memory>
#include <new>
#include <numeric>
#include <ostream>
#include <queue>
#include <set>
#include <sstream>
#include <stack>
#include <stdexcept>
#include <streambuf>
#include <string>
#include <typeinfo>
#include <utility>
#include <valarray>
#include <vector>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <array>
#include <atomic>
#include <chrono>
#include <condition_variable>
#include <forward_list>
#include <future>
#include <initializer_list>
#include <mutex>

```

```

#include <random>
#include <ratio>
#include <regex>
#include <scoped_allocator>
#include <system_error>
#include <thread>
#include <tuple>
#include <typeindex>
#include <type_traits>
#include <unordered_map>
#include <unordered_set>
#endif

using namespace std;

#define fi first
#define se second
#define be(x) x.begin()
#define en(x) x.end()
#define for0(i,n) for(int i=0;i<n;i++)
#define for1(i,n) for(int i=1;i<n;i++)
#define ret return
#define con continue
#define sz(x) x.size()

typedef long long ll;
typedef vector<ll> vll;
typedef pair<ll, ll> pll;
typedef set<ll> sll;
typedef vector<vll> vvll;
typedef vector<pll> vppll;
typedef string str;

#ifdef OG_Matveychick1
bool local = 1;
#else
bool local = 0;
#endif

void solve();
int main()
{
    if (local)

```



```

{
    freopen("input.txt", "r", stdin);
    freopen("output.txt", "w", stdout);
}
ll t = 1;
//cin>>t;
while (t--)
{
    solve();
}
}

```

```

void solve()
{
    ll n;
    cin >> n;
    vll a(n);
    for0(i, n)
    {
        str s;
        cin >> s;
        ll cnt = 0;
        for0(i, sz(s))
        {
            if (s[i] == 'a')
            {
                cnt++;
            }
            if (s[i] == 'b')
            {
                cnt += 5;
            }
            if (s[i] == 'c')
            {
                cnt += 10;
            }
            if (s[i] == 'd')
            {
                cnt += 50;
            }
            if (s[i] == 'e')
            {
                cnt += 100;
            }
        }
    }
}

```

```

        if (s[i] == 'f')
        {
            cnt += 200;
        }
        if (s[i] == 'g')
        {
            cnt += 500;
        }
        if (s[i] == 'h')
        {
            cnt += 1000;
        }
        if (s[i] == 'i')
        {
            cnt += 2500;
        }
    }
    a[i] = cnt;
}
ll ansi = 0, ansj = 1;
for0(i, n)
{
    for (ll j = i + 1; j < n; j++)
    {
        if (abs(a[i] - a[j]) > abs(a[ansi] - a[ansj]) || (abs(a[i] - a[j]) == abs(a[ansi] - a[ansj]) && i + j > ansi + ansj))
        {
            ansi = i;
            ansj = j;
        }
    }
}
cout << ansi + 1 << endl << ansj + 1;
}

```

Протокол проверяющей системы по задаче 2 «Сундуки»

OK
28 total tests runs, 28 passed, 0 failed.
Score gained: 100 (out of 100).

Посылка по задаче 3 «Кубик»

```

#ifdef _GLIBCXX_NO_ASSERT
#include <cassert>
#endif

```

```
#include <cctype>
#include <cerrno>
#include <cfloat>
#include <ciso646>
#include <climits>
#include <locale>
#include <cmath>
#include <setjmp>
#include <signal>
#include <stdarg>
#include <stddef>
#include <stdio>
#include <stdlib>
#include <string>
#include <time>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <complex>
#include <cfenv>
#include <inttypes>
#include <stdalign>
#include <stdbool>
#include <stdint>
#include <tgmath>
#include <wchar>
#include <wctype>
#endif

// C++
#include <algorithm>
#include <bitset>
#include <complex>
#include <deque>
#include <exception>
#include <fstream>
#include <functional>
#include <iomanip>
#include <ios>
#include <iosfwd>
#include <iostream>
#include <istream>
#include <iterator>
#include <limits>
#include <list>
```

```
#include <locale>
#include <map>
#include <memory>
#include <new>
#include <numeric>
#include <ostream>
#include <queue>
#include <set>
#include <sstream>
#include <stack>
#include <stdexcept>
#include <streambuf>
#include <string>
#include <typeinfo>
#include <utility>
#include <valarray>
#include <vector>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <array>
#include <atomic>
#include <chrono>
#include <condition_variable>
#include <forward_list>
#include <future>
#include <initializer_list>
#include <mutex>
#include <random>
#include <ratio>
#include <regex>
#include <scoped_allocator>
#include <system_error>
#include <thread>
#include <tuple>
#include <typeindex>
#include <type_traits>
#include <unordered_map>
#include <unordered_set>
#endif

using namespace std;

#define fi first
#define se second
```

```

#define be(x) x.begin()
#define en(x) x.end()
#define for0(i,n) for(int i=0;i<n;i++)
#define for1(i,n) for(int i=1;i<n;i++)
#define ret return
#define con continue
#define sz(x) x.size()

typedef long long ll;
typedef vector<ll> vll;
typedef pair<ll, ll> pll;
typedef set<ll> sll;
typedef vector<vll> vvll;
typedef vector<pll> vpll;
typedef string str;

#ifdef OG_Matveychick1
bool local = 1;
#else
bool local = 0;
#endif

void solve();
int main()
{
    if (local)
    {
        freopen("input.txt", "r", stdin);
        freopen("output.txt", "w", stdout);
    }
    ll t = 1;
    //cin>>t;
    while (t--)
    {
        solve();
    }
}

void solve()
{
    str s;
    cin >> s;
    vll a(16);

```

```

for0(i, 16)
{
    a[i] = s[i] - '0';
}
cin >> s;
for0(i, sz(s))
{
    if (s[i] == 'F')
    {
        vll a1 = a;
        a1[8] = a[4];
        a1[9] = a[5];
        a1[10] = a[6];
        a1[11] = a[7];
        a1[4] = a[11];
        a1[5] = a[10];
        a1[6] = a[9];
        a1[7] = a[8];
        a1[1] = a[0];
        a1[3] = a[1];
        a1[0] = a[2];
        a1[2] = a[3];
        a1[15] = a[14];
        a1[13] = a[15];
        a1[12] = a[13];
        a1[14] = a[12];
        a = a1;
    }
    if (s[i] == 'L')
    {
        vll a1 = a;
        a1[6] = a[4];
        a1[4] = a[6];
        a1[12] = a[0];
        a1[14] = a[2];
        a1[0] = a[12];
        a1[2] = a[14];
        a1[8] = a[9];
        a1[9] = a[8];
        a = a1;
    }
    if (s[i] == 'R')
    {
        vll a1 = a;

```

```

        a1[7] = a[5];
        a1[5] = a[7];
        a1[13] = a[1];
        a1[15] = a[3];
        a1[1] = a[13];
        a1[3] = a[15];
        a1[11] = a[10];
        a1[10] = a[11];
        a = a1;
    }
    if (s[i] == 'U')
    {
        vll a1 = a;
        a1[8] = a[10];
        a1[10] = a[8];
        a1[14] = a[1];
        a1[15] = a[0];
        a1[1] = a[14];
        a1[0] = a[15];
        a1[6] = a[7];
        a1[7] = a[6];
        a = a1;
    }
    if (s[i] == 'D')
    {
        vll a1 = a;
        a1[9] = a[11];
        a1[11] = a[9];
        a1[13] = a[2];
        a1[2] = a[13];
        a1[3] = a[12];
        a1[12] = a[3];
        a1[5] = a[4];
        a1[4] = a[5];
        a = a1;
    }
}
for0(i, 16)
{
    cout << a[i];
}
}

```

Протокол проверяющей системы по задаче 3 «Кубик»

OK

51 total tests runs, 51 passed, 0 failed.

Score gained: 100 (out of 100).

Посылка по задаче 4 «Codemirror»

```
#ifndef _GLIBCXX_NO_ASSERT
#include <cassert>
#endif
#include <cctype>
#include <cerrno>
#include <cfloat>
#include <ciso646>
#include <climits>
#include <locale>
#include <cmath>
#include <csetjmp>
#include <csignal>
#include <cstdarg>
#include <stddef>
#include <stdio>
#include <stdlib>
#include <string>
#include <time>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <ccomplex>
#include <cfenv>
#include <cinttypes>
#include <cstdalign>
#include <cstdbool>
#include <cstdint>
#include <ctgmath>
#include <wchar>
#include <cwctype>
#endif

// C++
#include <algorithm>
#include <bitset>
#include <complex>
#include <deque>
#include <exception>
#include <fstream>
#include <functional>
```



```
#include <iomanip>
#include <ios>
#include <iosfwd>
#include <iostream>
#include <istream>
#include <iterator>
#include <limits>
#include <list>
#include <locale>
#include <map>
#include <memory>
#include <new>
#include <numeric>
#include <ostream>
#include <queue>
#include <set>
#include <sstream>
#include <stack>
#include <stdexcept>
#include <streambuf>
#include <string>
#include <typeinfo>
#include <utility>
#include <valarray>
#include <vector>

#ifdef __GXX_EXPERIMENTAL_CXX0X__
#include <array>
#include <atomic>
#include <chrono>
#include <condition_variable>
#include <forward_list>
#include <future>
#include <initializer_list>
#include <mutex>
#include <random>
#include <ratio>
#include <regex>
#include <scoped_allocator>
#include <system_error>
#include <thread>
#include <tuple>
#include <typeindex>
#include <type_traits>
```

```

#include <unordered_map>
#include <unordered_set>
#endif

using namespace std;

#define fi first
#define se second
#define be(x) x.begin()
#define en(x) x.end()
#define all(a) be(a),en(a)
#define for0(i,n) for(int i=0;i<n;i++)
#define for1(i,n) for(int i=1;i<n;i++)
#define ret return
#define con continue
#define sz(x) x.size()

typedef long long ll;
typedef vector<ll> vll;
typedef pair<ll, ll> pll;
typedef set<ll> sll;
typedef vector<vll> vvll;
typedef vector<pll> vppll;
typedef string str;

#ifdef OG_Matveychick1
bool local = 1;
#else
bool local = 0;
#endif

void solve();
int main()
{
    if (local)
    {
        freopen("input.txt", "r", stdin);
        freopen("output.txt", "w", stdout);
    }
    ll t = 1;
    //cin>>t;
    while (t--)
    {

```

```

        solve();
    }
}

void solve()
{
    ll n;
    cin >> n;
    str s1;
    cin >> s1;
    ll k;
    cin >> k;
    vpll a(k);
    for0(i, k)
    {
        cin >> a[i].fi;
        a[i].second = i;
    }
    sort(all(a));
    str s = "";
    str buf = "";
    ll pos = 0;
    ll v = -1;
    ll it = 0;
    vector<string> ans(k);
    for0(i, n)
    {
        if (it < k && a[it].fi == i)
        {
            ans[a[it].se] = s;
            it++;
        }
        if (s1[i] >= 'a' && s1[i] <= 'z')
        {
            if (v == -1)
            {
                s.insert(be(s) + pos, s1[i]);
                pos++;
            }
            else
            {
                s.erase(be(s) + min(v, pos), be(s) + max(v, pos));
                pos = min(v, pos);
                v = -1;
            }
        }
    }
}

```

```

                s.insert(be(s) + pos, s1[i]);
                pos++;
            }
        }
    if (s1[i] == '<')
    {
        if (v == -1)
        {
            v = -1;
            pos = max(0ll, pos - 1);
        }
        else
        {
            pos = min(v, pos);
            v = -1;
        }
    }
    if (s1[i] == '>')
    {
        if (v == -1)
        {
            v = -1;
            pos = min((ll)sz(s), pos + 1);
        }
        else
        {
            pos = max(v, pos);
            v = -1;
        }
    }
    if (s1[i] == '{')
    {
        if (v == -1)
        {
            v = pos;
            pos = max(0ll, pos - 1);
        }
        else if (v == pos - 1)
        {
            v = -1;
            pos = max(0ll, pos - 1);
        }
        else
        {

```

```

        pos = max(0ll, pos - 1);
    }
}
if (s1[i] == '}')
{
    if (v == -1)
    {
        v = pos;
        pos = min((ll)sz(s), pos + 1);
    }
    else if (v == pos + 1)
    {
        v = -1;
        pos = min((ll)sz(s), pos + 1);
    }
    else
    {
        pos = min((ll)sz(s), pos + 1);
    }
}
if (s1[i] == 'C')
{
    if (v == -1)
    {
        buf = "";
    }
    else
    {
        if (pos < v)
        {
            buf = s.substr(pos, (v - pos));
        }
        else
        {
            buf = s.substr(v, (pos - v));
        }
        v = -1;
    }
}
if (s1[i] == 'V')
{
    if (v == -1)
    {
        /*for0(j, sz(buf))

```

```

        {
            s.insert(be(s) + pos, buf[j]);
            pos++;
        }*/
        s.insert(be(s) + pos, all(buf));
        pos += sz(buf);
    }
    else
    {
        s.erase(be(s) + min(v, pos), be(s) + max(v, pos));
        pos = min(v, pos);
        v = -1;
        s.insert(be(s) + pos, all(buf));
        pos += sz(buf);
    }
}
if (s1[i] == 'X')
{
    if (v == -1)
    {
        buf = "";
    }
    else
    {
        if (pos < v)
        {
            buf = s.substr(pos, (v - pos));
            s.erase(be(s) + min(v, pos), be(s) + max(v, pos));
        }
        else
        {
            buf = s.substr(v, (pos - v));
            s.erase(be(s) + min(v, pos), be(s) + max(v, pos));
            pos = v;
        }
        v = -1;
    }
}
if (s1[i] == 'D')
{
    if (v == -1)
    {
        if (pos != 0)
            s.erase(pos - 1);
    }
}

```

```

        pos = max(0ll, pos - 1);
    }
    else
    {
        s.erase(be(s) + min(v, pos), be(s) + max(v, pos));
        pos = min(v, pos);
        v = -1;
    }
}
}
if (it < k && a[it].first == n)
{
    ans[a[it].se] = s;
}
for0(i, k)
{
    cout << ans[i] << endl;
}
}

```

Протокол проверяющей системы по задаче 4 «Codemirror»

см. файл report4.txt