

Олимпиада «Ломоносов» по информатике
2023-2024 учебный год. Заключительный тур
Работа участника с id заявки 1231985, логином inf24f_251

Сводный итог по всем задачам в проверяющей системе

Run ID	Time	User name	Problem	Language	Result	Tests	Score
200	1:17:05	inf24f_251	1	g++	OK	28	100
443	2:57:47	inf24f_251	2	python3	OK	28	100
279	1:52:33	inf24f_251	3	python3	OK	28	100
125	0:56:05	inf24f_251	4	g++	Partial solution	8	35
538	3:30:01	inf24f_251	5	python3	Partial solution	10	40
669	3:57:08	inf24f_251	6	python3	Partial solution	1	0
375 технических баллов							
62 итоговых балла							

Посылка по задаче 1

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <algorithm>
[4] #include <iomanip>
[5]
[6] using namespace std;
[7]
[8]
[9] int main()
[10] {
[11]     int n, a, k1 = 0, j = 32, kol = 0;
[12]     cin >> n;
[13]     vector<long long> t(33, 0);
[14]     t[3] = 1;
[15]     for (int i = 4; i < 33; i++)
[16]     {
[17]         t[i] = t[i - 1] + t[i - 2] + t[i - 3] + t[i - 4];
[18]     }
[19]     for (int i = 0; i < n; i++)
[20]     {
[21]         k1 = 0;
[22]         j = 32;
[23]         cin >> a;
[24]         while (a > 0)
[25]         {
[26]             if (a >= t[j])
[27]             {
[28]                 a = a - t[j];
[29]                 k1 = k1 + 1;
[30]             }
[31]             j = j - 1;
[32]         }
[33]         if (k1 % 2 == 0)
[34]         {
[35]             kol = kol + 1;
[36]         }
[37]     }
[38]     cout << kol;
[39]     return 0;
[40] }
[41] }
```

Посылка по задаче 2

```
[1] class Bin_number():
[2]     def __init__(self):
[3]         self.sp = [0]
[4]     def __add__(self, t):
[5]         if (len(self.sp) <= t):
[6]             self.sp = self.sp + [0] * (t - len(self.sp) + 1)
[7]         self.sp[t] = self.sp[t] + 1
[8]         i = t
[9]         while (self.sp[i] == 2 and i > 0):
[10]             self.sp[i - 1] = self.sp[i - 1] + 1
[11]             self.sp[i] = 0
[12]             i = i - 1
[13]         return self
[14]
[15]     def compare(self, other):
[16]         i = 0
[17]         while (i < len(self.sp) and i < len(other.sp)):
[18]             if (self.sp[i] > other.sp[i]):
[19]                 return 1
[20]             if (self.sp[i] < other.sp[i]):
[21]                 return 0
[22]             i = i + 1
[23]         if (len(self.sp) == len(other.sp)):
[24]             return 1
[25]         if (i == len(self.sp)):
[26]             return 0
[27]         return 1
[28]
[29]     def __str__(self):
[30]         if (self.sp[0] == 1):
[31]             return "1.0"
[32]         d = ""
[33]         j = -1
[34]         while (self.sp[j] == 0):
[35]             j = j - 1
[36]         n = len(self.sp) + j + 1
[37]         for i in range(n):
[38]             if (i == 0 and n > 1):
[39]                 d = f"{self.sp[i]}."
[40]             elif (i == 0):
[41]                 d = f"{self.sp[i]}"
[42]             else:
[43]                 d = d + str(self.sp[i])
[44]         return d
[45]
[46] s = input()
[47] v = {"Y":Bin_number(), "W":Bin_number(), "V":Bin_number(), "R":Bin_number(),
"O":Bin_number(), "G":Bin_number(), "D":Bin_number(), "C":Bin_number(), "B":Bin_number()}
[48]
[49] def f(s, t):
[50]     global v
[51]     if (s[0] == "Q"):
[52]         i = 1
[53]         while (i <= 8):
[54]             if (s[i] != "Q"):
[55]                 f(s[i], t + 3)
[56]             else:
[57]                 s = s[:i + 1] + f(s[i:], t + 3)
[58]             i = i + 1
[59]         return s[i:]
[60]     else:
[61]         v[s[0]] = v[s[0]] + t
[62]         return ""
[63]
[64] f(s, 0)
[65] c = ""
[66] m = Bin_number()
[67] for e in v:
[68]     if (v[e].compare(m)):
[69]         c = e
[70]         m = v[e]
[71] print(c)
[72] print(m)
```

Посылка по задаче 3

```
[1] def make_norm(s):
[2]     t = 1
[3]     i = 0
[4]     c = 0
[5]     while (i < len(s) - 2):
[6]         if (s[i] == "i"):
[7]             if (s[i + 1] == "("):
[8]                 if (s[i + 2] == "("):
[9]                     c = c + t * 3
[10]                    i = i + 3
[11]                else:
[12]                    c = c + t * 2
[13]                    i = i + 2
[14]            else:
[15]                c = c + t * 1
[16]                i = i + 1
[17]            elif (s[i] == "I"):
[18]                if (s[i + 1] == "("):
[19]                    if (s[i + 2] == "("):
[20]                        c = c + t * 6
[21]                        i = i + 3
[22]                    else:
[23]                        c = c + t * 5
[24]                        i = i + 2
[25]                else:
[26]                    c = c + t * 4
[27]                    i = i + 1
[28]            elif (s[i] == "J"):
[29]                if (s[i + 1] == "("):
[30]                    if (s[i + 2] == "("):
[31]                        c = c + t * 9
[32]                        i = i + 3
[33]                    else:
[34]                        c = c + t * 8
[35]                        i = i + 2
[36]                else:
[37]                    c = c + t * 7
[38]                    i = i + 1
[39]            elif (s[i] == "j"):
[40]                if (s[i + 1] == "("):
[41]                    if (s[i + 2] == "("):
[42]                        c = c + t * 12
[43]                        i = i + 3
[44]                    else:
[45]                        c = c + t * 11
[46]                        i = i + 2
[47]                else:
[48]                    c = c + t * 10
[49]                    i = i + 1
[50]            else:
[51]                i = i + 2
[52]        t = t * 12
[53]    return c
[54]
[55] al = {1:"i", 2:"i(", 3:"i(", 4:"I", 5:"I(", 6:"I(", 7:"J", 8:"J)", 9:"J)", 10:"j", 11:"j)", 12:
[56] "j))"}
[57]
[58] def make_elf(n):
[59]     sp = []
[60]     while (n > 0):
[61]         if (n % 12 == 0):
[62]             sp.append(12)
[63]             n = n - 12
[64]         else:
[65]             sp.append(n % 12)
[66]             n = n // 12
[67]     st = ""
[68]     for e in sp:
[69]         st = st + al[e]
[70]     return st
[71]
[72]
[73] n = int(input())
[74] sp = [0] * n
[75] k = 0
[76] l = 0
[77] for i in range(n):
[78]     s = input()
[79]     s = s + " "
[80]     sp[i] = make_norm(s)
[81]     if (sp[i] <= sp[k]):
[82]         k = i
[83]     if (sp[i] >= sp[l]):
[84]         l = i
[85] l, k = max(k, l), min(k, l)
[86] if (k == l):
[87]     k = l - 1
[88] print(make_elf(k + 1))
    print(make_elf(l + 1))
```

Посылка по задаче 4

```
[1] #include <iostream>
[2] #include <vector>
[3] #include <algorithm>
[4] #include <iomanip>
[5]
[6] using namespace std;
[7]
[8]
[9] int main()
[10] {
[11]     int r, c, r1, r2, r3;
[12]     long long maxv = 0, val = 0, change = 0, ans = 0;
[13]     cin >> r >> c;
[14]     cin >> r1 >> r2 >> r3;
[15]     vector< vector<int> > v(r, vector<int> (c, 0));
[16]     vector< vector< vector< vector<long long> > > > dp(c, vector< vector< vector<long long> > > (r, vector<long long> (r, 0)));
[17]     for (int i = 0; i < r; i++)
[18]     {
[19]         for (int j = 0; j < c; j++)
[20]         {
[21]             cin >> v[i][j];
[22]         }
[23]     }
[24]     if (r1 == r2 && r2 == r3)
[25]     {
[26]         dp[0][r1][r2][r3] = v[r1][0];
[27]     }
[28]     else if (r1 == r2)
[29]     {
[30]         dp[0][r1][r2][r3] = v[r1][0] + v[r3][0];
[31]     }
[32]     else if (r2 == r3)
[33]     {
[34]         dp[0][r1][r2][r3] = v[r1][0] + v[r2][0];
[35]     }
[36]     else if (r1 == r3)
[37]     {
[38]         dp[0][r1][r2][r3] = v[r1][0] + v[r2][0];
[39]     }
[40]     else
[41]     {
[42]         dp[0][r1][r2][r3] = v[r1][0] + v[r2][0] + v[r3][0];
[43]     }
[44]     for (int i = 1; i < c; i++)
[45]     {
[46]         for (int x1 = 0; x1 < r; x1++)
[47]         {
[48]             for (int x2 = 0; x2 < r; x2++)
[49]             {
[50]                 for (int x3 = 0; x3 < r; x3++)
[51]                 {
[52]                     maxv = 0;
[53]                     change = 0;
[54]                     for (int d1 = 0; d1 < 3; d1++)
[55]                     {
```

```

[56]         for (int d2 = 0; d2 < 3; d2++)
[57]         {
[58]             for (int d3 = 0; d3 < 3; d3++)
[59]             {
[60]                 if (0 <= x1 + d1 - 1 && 0 <= x2 + d2 - 1 && 0 <= x3 + d3 - 1 && x1 + d1 - 1 < r && x2 + d2 - 1 < r && x3 + d3 - 1 < r)
[61]                 {
[62]                     val = dp[i - 1][x1 + d1 - 1][x2 + d2 - 1][x3 + d3 - 1];
[63]                     maxv = max(maxv, val);
[64]                 }
[65]             }
[66]         }
[67]     }
[68]     if (x1 == x2 && x2 == x3)
[69]     {
[70]         change = v[x1][i];
[71]     }
[72]     else if (x1 == x2)
[73]     {
[74]         change = v[x1][i] + v[x3][i];
[75]     }
[76]     else if (x2 == x3)
[77]     {
[78]         change = v[x1][i] + v[x2][i];
[79]     }
[80]     else if (x1 == x3)
[81]     {
[82]         change = v[x1][i] + v[x2][i];
[83]     }
[84]     else
[85]     {
[86]         change = v[x1][i] + v[x2][i] + v[x3][i];
[87]     }
[88]     dp[i][x1][x2][x3] = maxv + change;
[89]     if (i == c - 1)
[90]     {
[91]         ans = max(ans, dp[i][x1][x2][x3]);
[92]     }
[93] }
[94] }
[95] }
[96] }
[97] cout << ans;
[98] return 0;
[99] }

```

Посылка по задаче 5

```
[1] s = input()
[2] f = input()
[3] df = {}
[4] for el in f:
[5]     df[el] = df.get(el, 0) + 1
[6] ans = []
[7]
[8] p = 1
[9] for e in df:
[10]     if (s.count(e) < df[e]):
[11]         p = 0
[12]
[13] if p:
[14]     for i in range(len(s)):
[15]         for j in range(i, len(s)):
[16]             p = 1
[17]             sn = s[i:j+1]
[18]             for e in df:
[19]                 if (sn.count(e) < df[e]):
[20]                     p = 0
[21]             if p:
[22]                 if (len(ans) == 0):
[23]                     ans = [i, j]
[24]                 else:
[25]                     if (j - i + 1 < ans[1] - ans[0] + 1):
[26]                         ans = [i, j]
[27] if (len(ans) == 0):
[28]     print()
[29] else:
[30]     print(s[ans[0]: ans[1] + 1])
```

Посылка по задаче 6

```
[1] with open("input.txt") as file:
[2]     fr = file.readlines()
[3] d = {}
[4] sp = []
[5] t = {}
[6] i = 0
[7] for i in range(len(fr)):
[8]     if (i == len(fr) - 1):
[9]         s = fr[i].split(";")
[10]    else:
[11]        s = fr[i][:-1].split(";")
[12]    if (s[-1] == "OK"):
[13]        d[s[0]] = max(d.get(s[0], 0), len(s) - 1)
[14]    sp.append(s)
[15]    i = i + 1
[16] for i in range(len(sp)):
[17]     t[sp[i][0]] = t.get(sp[i][0], {})
[18]     st = ""
[19]     for j in range(1, len(sp[i])):
[20]         if (sp[i][j] == 'OK'):
[21]             st = st + "1"
[22]         else:
[23]             st = st + "0"
[24]     st = st + "0" * (d[sp[i][0]] - len(st))
[25]     t[sp[i][0]][st] = t[sp[i][0]].get(st, 0) + 1
[26] for e in t:
[27]     print(d[e], len(t[e]))
```