

Олимпиада «Ломоносов» по информатике  
2023-2024 учебный год. Заключительный тур  
Работа участника с id заявки 1253865, логином inf24f\_137

**Сводный итог по всем задачам в проверяющей системе**

Run ID	Time	User name	Problem	Language	Result	Tests	Score
25	0:32:45	inf24f_137	1	python3	OK	28	100
66	1:13:38	inf24f_137	2	python3	Partial solution	5	8
158	2:22:05	inf24f_137	3	python3	Partial solution	26	92
97	1:47:56	inf24f_137	5	python3	OK	22	100
300 технических баллов							
60 итоговых баллов							

## Посылка по задаче 1

```
[1] T = [1, 2, 4, 7, 13, 24, 44, 81, 149, 274, 504, 927, 1705, 3136, 5768, 10609, 19513, 35890, 66012, 121415, 223317, 410744, 755476, 1389537, 2555757, 4700770, 8646064, 15902591]
[2]
[3] def found(x):
[4]     l, r = 0, len(T)
[5]     while r - l > 1:
[6]         mid = (l + r) // 2
[7]         if T[mid] <= x:
[8]             l = mid
[9]         else:
[10]            r = mid
[11]     return l
[12]
[13] def toT(n):
[14]     res = ''
[15]     res2 = 0
[16]     if n:
[17]         i = found(n)
[18]         last = i
[19]         n -= T[i]
[20]         res += '1'
[21]         res2 += 1
[22]     while n:
[23]         i = found(n)
[24]         n -= T[i]
[25]         res += '0' * (last - i - 1)
[26]         res += '1'
[27]         res2 += 1
[28]         last = i
[29]     return res, res2
[30]
[31] n = int(input())
[32] res = 0
[33]
[34] for i in range(n):
[35]     a = int(input())
[36]     if toT(a)[1] % 2:
[37]         res += 1
[38]
[39] print(res)
[40]
[41]
[42]
[43]
[44]
[45]
[46]
[47]
[48]
[49]
[50]
[51]
[52]
```

## Посылка по задаче 2

```
[1] Res = {i: {0:0} for i in 'WROYGCBVD'}
[2]
[3] s = input()
[4] layer = 0
[5] Layers = {0: 0}
[6]
[7] for i in range(len(s)):
[8]     if Layers[layer] >= 4:
[9]         layer -= 1
[10]    if s[i] != 'Q':
[11]        if layer not in Res[s[i]]:
[12]            Res[s[i]][layer] = 0
[13]            Res[s[i]][layer] += 1
[14]            Tlayer = layer
[15]            while Res[s[i]][Tlayer] == 4:
[16]                del Res[s[i]][Tlayer]
[17]                Res[s[i]][Tlayer - 1] += 1
[18]                Tlayer -= 1
[19]            Layers[layer] += 1
[20]    if s[i] == 'Q':
[21]        layer += 1
[22]        Layers[layer] = 0
[23]
[24] def f(A):
[25]     if A[0] == 1: return '1.0'
[26]     res = '0.'
[27]     for i in range(1, max(A) + 1):
[28]         res += bin(A.get(i, 0))[2:].rjust(2, '0')
[29]     if res[-1] == '0':
[30]         res = res[:-1]
[31]     if res == '0.':
[32]         res = '0.0'
[33]     return res
[34]
[35] Res = {i: f(Res[i]) for i in Res}
[36] res = max([Res[i] for i in Res])
[37] res1 = max([i for i in Res if Res[i] == res])
[38] print(res1)
[39] print(res)
```

### Посылка по задаче 3

```
[1] n = int(input())
[2] Alp = {'>': 1, '>!': 2, '>!!': 3, '>!!!': 4, '>?': 5, '<': 6, '<!': 7, '<!!': 8, '<!!!': 9, '<?': 10}
[3] Alp2 = {Alp[i]: i for i in Alp}
[4] def frombase(x):
[5]     if x == '()': return 0
[6]     res = 0
[7]     l = 0
[8]     ind = 0
[9]     s = ''
[10]    for r in range(len(x)):
[11]        s += x[r]
[12]        if r != len(x) - 1 and s + x[r + 1] in Alp: continue
[13]        res += Alp[s] * 10 ** ind
[14]        ind += 1
[15]        s = ''
[16]    return res
[17]
[18] def tobase(x):
[19]     if x == 0: return '()'
[20]     res = ''
[21]     while x:
[22]         if x % 10 != 0:
[23]             res += Alp2[x % 10]
[24]             x //= 10
[25]         else:
[26]             res += '<?'
[27]             x //= 10
[28]             x -= 1
[29]     return res
[30]
[31] A = [frombase(input()) for i in range(n)]
[32] a, b = A.index(min(A)), A.index(max(A))
[33]
[34] if a > b:
[35]     a, b = b, a
[36]
[37] print(tobase(a + 1))
[38] print(tobase(b + 1))
[39]
```

Посылок по задаче 4 не было.

## Посылка по задаче 5

```
[1] s1 = input()
[2] s2 = input()
[3]
[4] def f(A, B):
[5]     for i in B:
[6]         if A.get(i, 0) < B[i]:
[7]             return False
[8]     return True
[9]
[10] l = 0
[11] A = dict()
[12] B = dict()
[13] for i in s2:
[14]     if i not in B:
[15]         B[i] = 0
[16]         B[i] += 1
[17] minlen = float('inf')
[18] res = ''
[19] for r in range(len(s1)):
[20]     if s1[r] not in A:
[21]         A[s1[r]] = 0
[22]         A[s1[r]] += 1
[23]         if f(A, B):
[24]             A[s1[l]] -= 1
[25]             l += 1
[26]             while f(A, B):
[27]                 A[s1[l]] -= 1
[28]                 l += 1
[29]             l -= 1
[30]             A[s1[l]] += 1
[31]             if minlen > (r - l + 1):
[32]                 minlen = (r - l + 1)
[33]                 res = s1[l:r + 1]
[34] print(res)
[35]
```