



**МОСКОВСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
имени М.В. ЛОМОНОСОВА**

ОЛИМПИАДНАЯ РАБОТА

Наименование олимпиады школьников: **«Ломоносов»**

Профиль олимпиады: **Информатика**

ФИО участника олимпиады: **Муштриев Максим Игоревич**

Класс: **8 класс**

Технический балл: **92**

Дата проведения: **17 марта 2022 г.**

Результаты проверки:

Оценка участника строится в 2 этапа:

1. оценка за задание - рассчитывается путем запуска тестов и определения правильности работы программы на тестах, до 100 баллов по каждой задаче;
2. нормализация оценки - полученная сумма делится на 2.9.

Оценки за задания:

№	1	2	3	4	5
Оценка	100	90	0	72	4

Задание 1. Попытка 1.

```
k = int(input())
```

```
n = int(input())
```

```
fkt = {
```

```
    1:1,
```

```
    2:2,
```

```
    3:6,
```

```
    4:24,
```

```
    5:120,
```

```
    6:720,
```

```
    7:5040,
```

```
    8:40320,
```

```
    9:362880,
```

```
   10:3628800,
```

```
   11:39916800,
```

```
   12:479001600,
```

```
   13:6227020800,
```

```
   14:87178291200,
```

```
   15:1307674368000,
```

```
   16:20922789888000,
```

```
   17:355687428096000,
```

```
   18:6402373705728000,
```

```
   19:121645100408832000,
```

```
   20:2432902008176640000,
```

```
   21:51090942171709440000,
```

```
22:1124000727777607680000,  
23:25852016738884976640000,  
24:620448401733239439360000,  
25:15511210043330985984000000,  
26:403291461126605635584000000,  
27:10888869450418352160768000000,  
28:304888344611713860501504000000,  
29:8841761993739701954543616000000,  
30:265252859812191058636308480000000,  
31:8222838654177922817725562880000000,  
32:263130836933693530167218012160000000,  
33:8683317618811886495518194401280000000,  
34:295232799039604140847618609643520000000,  
35:10333147966386144929666651337523200000000  
}
```

```
alph = {  
  "0":0,  
  "1":1,  
  "2":2,  
  "3":3,  
  "4":4,  
  "5":5,  
  "6":6,  
  "7":7,
```

"8":8,
"9":9,
"A":10,
"B":11,
"C":12,
"D":13,
"E":14,
"F":15,
"G":16,
"H":17,
"I":18,
"J":19,
"K":20,
"L":21,
"M":22,
"N":23,
"O":24,
"P":25,
"Q":26,
"R":27,
"S":28,
"T":29,
"U":30,
"V":31,
"W":32,

```
"X":33,  
"Y":34,  
"Z":35  
}
```

```
mass = [input().rstrip("0") for _ in range(n)]
```

```
ind = n+1
```

```
for i in mass[::-1]:
```

```
    ind -= 1
```

```
    s = 0
```

```
    ln = len(i)
```

```
    for jnd, j in enumerate(i[::-1]):
```

```
        s += alph[j]*fkt[jnd+1]
```

```
    if s % fkt[k] == 0:
```

```
        print(0 if i == "" else i, ind, sep="\n")
```

```
        break
```

```
else:
```

```
    print(-1)
```

Задание 2. Попытка 1.

```
n = int(input())
```

```
alph = {
```

```
    "0":0,
```

```
    "1":1,
```

```
    "2":2,
```

```
    "3":3,
```

```
    "4":4,
```

```
    "5":5,
```

```
    "6":6,
```

```
    "7":7,
```

```
    "8":8,
```

```
    "9":9,
```

```
    "A":10,
```

```
    "B":11,
```

```
    "C":12,
```

```
    "D":13,
```

```
    "E":14,
```

```
    "F":15,
```

```
    "G":16,
```

```
    "H":17,
```

```
    "I":18,
```

```
    "J":19,
```

```
    "K":20,
```

```
    "L":21,
```

```
"M":22,  
"N":23,  
"O":24,  
"P":25,  
"Q":26,  
"R":27,  
"S":28,  
"T":29,  
"U":30,  
"V":31,  
"W":32,  
"X":33,  
"Y":34,  
"Z":35  
}  
ch = [i for i in list(input()) if i in alph]  
s = ""  
ln = 0  
if ch == []:  
    print(-1)  
else:  
    ch = sorted(ch)  
    for i in ch:  
        if alph[i] <= ln+1:  
            s += i
```



```

    ln += 1
else:
    break
s = s[::-1]
if s != "":
    if ln > 35:
        x = ['1', '2', '3', '4', '5', '6', '7', '8', '9', 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L',
'M', 'N', 'O', 'P', 'Q', 'R', 'S', 'T', 'U', 'V', 'W', 'X', 'Y', 'Z']
        if "ZYXWVUTSRQPONMLKJIHGFEDCBA987654321" in s:
            print("ZYXWVUTSRQPONMLKJIHGFEDCBA987654321")
        else:
            ls = list(s)
            for ind, i in enumerate(isx := x.copy()):
                if i not in ls:
                    for j in range(ind, -1, -1):
                        if x[j] in ls:
                            x[ind] = x[j]
                            ls.remove(x[j])
                            break
                else:
                    if "0" in ls:
                        x[ind] = "0"
                        ls.remove("0")
                    else:
                        ls.remove(i)

```

```
print("".join(sorted(x)[::-1]))
```

```
else:
```

```
    print(s)
```

```
else:
```

```
    print(-1)
```

Задание 3. Попытка 1.

```
a = int(input())

m = [[], []]

ln = []

st = []

ln1 = []

st1 = []

input()

while (x:=input()) != "BACK":

    m[0].append(list(map(int, x.split())))

while (x:=input()) != "END":

    m[1].append(list(map(int, x.split())))

for i in m[0]:

    if i[0] == i[1]:

        ln.append(i[0])

    else:

        st.append(i[0])

        st.append(i[1])

for i in m[1]:

    if i[0] == i[1]:

        ln1.append(i[0])

    else:

        st1.append(i[0])

        st1.append(i[1])
```

```
if set(ln) == set(st1) and set(st) == set(ln1):
```

```
    print("YES")
```

```
else:
```

```
    print("NO")
```

Задание 4. Попытка 1.

```
n, m = map(int, input().split())
s = {i:[] for i in range(1, n+1)}
for i in range(m):
    inp = list(map(int, input().split()))
    s[inp[0]].append(inp[1])
    s[inp[1]].append(inp[0])
mn = n
mi = 0
for k, v in s.items():
    if (lv := len(v)) < mn:
        mn = lv
        mi = k
mass = sorted([sorted([mi, i]) for i in s[mi]])
print(mn)
for i in mass:
    print(i[0], i[1])
```

Задание 5. Попытка 1.

```
a1, b1, a2, b2 = map(int, input().split())
```

```
if a1 == a2:
```

```
    print(max(b1, b2) - min(b1, b2)+1)
```

```
elif b1 == b2:
```

```
    print((x := max(a1, a2) - min(a1, a2)) + x//2 + 1)
```

```
else:
```

```
    ai = max(a1, a2) - min(a1, a2)
```

```
    bi = max(b1, b2) - min(b1, b2)
```

```
    print(ai + ai//2 + bi + bi//2)
```

Задание 5. Попытка 2.

```
a1, b1, a2, b2 = map(int, input().split())
```

```
if a1 == a2:
```

```
    print(max(b1, b2) - min(b1, b2)+1)
```

```
elif b1 == b2:
```

```
    print((x := max(a1, a2) - min(a1, a2)) + x//2 + 1)
```

```
else:
```

```
    ai = max(a1, a2) - min(a1, a2)
```

```
    bi = max(b1, b2) - min(b1, b2)
```

```
    print(ai + (ai//2 or bi//2) + bi)
```