CP468 Artificial Intelligence

Simple Genetic Algorithm

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Discussion

The Simple Genetic Algorithm (SGA) is an Artificial Intelligence technique that can find the inputs to a black-box objective function (OF) such that this function is maximized/minimized.

We used Python strings to represent the binary vectors. These were used because string manipulation in Python is very straightforward, making programming and testing easier, as well as creating more readable code.. For the three classical benchmark OFs, our implementation was to take a binary vector of 0s and 1s and convert it into a Cartesian coordinate between -5 and 5. We accomplished this by taking binary vectors as having size multiples of 16. If you have 32 bits, it's two dimensions of input. Each 16-bit block is decomposed into a short integer. The first bit is the sign bit and the remaining 15 give a number between -32767 and 32767. This number is then divided by 32767 and multiplied by 5 to give us 65535 possible numbers between -5 and 5.

For the additional OFs provided, no translation into Cartesian coordinates was necessary since those OFs compute their results directly from the bits.

To implement the biased roulette, we first sorted the list, then performed a weighted coin flip to determine whether a vector makes it to the tentative next generation. The best vector has a 25% chance of being selected. If it isn't, then, the next vector has a 25% chance and so on until one is selected. We repeat this process until we have the same number of tentative new generation members as we started with. If the population size were 100, on average, the best vector would be 1 * 25/100 = 25% of the new population, the next would make up 0.75 * (25/100) = 18.75%, and so on. This makes it so that individuals with lower OF values pass on their genes more often.

The loop of reproduction, crossover, and mutation eventually results in a binary vector that minimizes the OF. However, we did run into some challenges which we will outline below.

The de Jong function decreases towards the global maximum in the same way from all directions. This means that it is fairly simple for the binary vectors to find their way towards the global minimum. However, this is more tricky for the Rosenbrock and Himmelblau functions. The binary vectors may get stuck in a rut far away from the global minima. To combat this, we check each generation whether the last generation's fittest individual is within 0.001 of this generation's. If so, we generate a new random population and restart the process.

The second major hurdle of this implementation is that the inputs may not give an exactly 0 output. For Rosenbrock and Himmelblau, there isn't a binary encoding that gives exactly 0 as an output to the OF. Our solution to this is to accept any values 0.00xxxx… as solutions. If the OF gives less than a hundredth as the objective value, we say that we're about the global minimum and stop looking.

Installation and Code Execution

This program is written in Python and has been tested on Windows 10 machines running Python 3.10. Older versions of Python and other operating systems should work alright.

1. 1. Create sga.py on your computer, making sure it contains all of the code below in this document. There is only one file, sga.py. Administrator privileges should not be necessary for the code to execute. Here is a Github link to download it from, so that you don't have to copy and paste it from the text.
2. Two options for execution:

   a. Open sga.py in a code editor configured to use a Python interpreter and run the file.
   b. Open a terminal, navigate to the folder containing sga.py, and type: ‘python sga.py’.

3. After execution, some text files will be created. There is one for each objective function which has information about the best individual in each generation, as well as summary.txt, which tells you about the very last generation of all OFs, i.e., the solutions that were found.

Example Output (Summary.txt)

```
-------
DE JONG
-------
Population Size = 16
Vector Length = 32
Fittest member of gen 11 is: 10000000000000000000000000000000 with objective function
value of: 0.0
----------
ROSENBROCK
----------
Population Size = 16
Vector Length = 32
```

```
Fittest member of gen 137 is: 10011001011101101001100101100011 with objective function

value of: 0.003529658965565565

Number of resets: 2

----------

HIMMELBLAU

----------

Population Size = 16

Vector Length = 32

Fittest member of gen 820 is: 11001100101011011011001101111010 with objective function

value of: 0.0018191579029568795

Number of resets: 15

----------

2CCOF.25.C

----------

Population Size = 16

Vector Length = 51

Fittest member of gen 18 is: 000000000000000000000000100000000000000000001000000

with objective function value of: 24

----------

2CCOF.29.C

----------

Population Size = 16

Vector Length = 59
```

```
Fittest member of gen 21 is:
10000000000001000000000000000000000000000001000000000000000 with objective
function value of: 28
----------
2CCOF.99.C
----------
Population Size = 16
Vector Length = 199
Fittest member of gen 2946 is:
000000000000000000000000000000000000000000000000000000001000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000000000
0100000000000000000000000000000000000000000 with objective function value of: 98
```

Code

```
# Simple-Genetic-Algorithm

# Python SGA implementation for WLU Fall 2022 CP468 Term Project


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import random

from copy import deepcopy


'''

Section 1: Random Population

Description: Generate a random population of binary vectors

Parameters: numVectors = number of binary vectors in population

            sizeOfVector = number of 'bits' in each vector

Returns:    population = array of strings, each string is made of 0s and 1s

'''

def generateRandomPopulation(numVectors, sizeofVector):

    population = ["" for i in range(0, numVectors)] # random population of binary vectors
    for i in range(0, numVectors):
        for j in range(0, sizeofVector):
            if random.random() < 0.5:
                population[i] += "0"
            else:
                population[i] += "1"
    return population


'''
Section 2: Reproduction, Crossover, and Mutation
Description: Peform reproduction, then crossover, then mutation on the input (current)
population
Parameters: initialPopulation = the population of the current generation
            mode (reproduction) = which OF we are using
            n (reproduction) = the size of the binary vectors divided by two, used for dj, rb, and hf
input decoding
            probability (crossover and mutation) = Chance of performing crossover or mutation,
usually set to 100%.
Returns:    newPopulation (mutation) = the next generation of the population after undergoing
reproduction, crossover and mutation
'''
def reproduction(initialPopulation, mode, n):
    # Implement a biased roulette creating a tentative new generation
    # Individuals with a lower value of objectiveFunction have a greater chance of proceeding


    # Initialize new population after reproduction
    tentativePopulation = []


    # Create a list of candidate, OF(candidate) pairs
    objList = []
    for candidate in initialPopulation:
        objList.append([candidate, objectiveFunction(candidate, mode, n)])
    # Sort this list. Lowest OF first, Highest OF last
    objList = sorted(objList, key= lambda x: x[1])
    # Implement a biased roulette that favours LOWER objective function values
    odds = 0.25
    for i in range(0, len(initialPopulation)):
        curr = objList[0][0]
        i = 0
        # Pick the best candidate odds % of the time.
        # Then, the next best is going to be picked odds% of the time on occurences where a better
candidate wasn't picked
        # In this way, the best candidate has the best chance to be selected
        # And chance of being selected decreases as OF(candidate) increases
        while i < len(initialPopulation) -1 and  random.random() <= odds:
            i += 1
            curr = objList[i][0]
        tentativePopulation.append(curr)
    return tentativePopulation


def crossover(tentativePopulation, probability):
    # Generate new individuals by combining pairs
    # We randomize the order of the tentativePopulation copy before selecting pairs
    temp = deepcopy(tentativePopulation)
    random.shuffle(temp)

    # Initialize new population after crossover
    crossPopulation = []

    # This iterator is used to step through the population in pairs of values
    iterator = iter(temp)
    for a in iterator:
        b = next(iterator)

        # Probability is the chance of performing crossover, usually set to 1 for us
        if(random.random() <= probability):
            # pair a,b produce offspring x,y where:
            # x = bits of a up to crossoverSite and bits of b after
            # y = bits of b up to crossoverSite and bits of a after
            crossoverSite = random.randint(1, len(tentativePopulation) - 1)
            xfront = a[0:crossoverSite]
            yfront = b[0:crossoverSite]
            xback = b[crossoverSite:]
            yback = a[crossoverSite:]
            # Concatenate strings
            x = xfront + xback
            y = yfront + yback
            # Add the offspring to the new population
            crossPopulation.append(x)
            crossPopulation.append(y)
        # If we decided not to do crossover, we just let the whole candidates move onto the
mutation phase
        else:
            crossPopulation.append(a)
            crossPopulation.append(b)
    return crossPopulation


def mutation(crossPopulation, probability):
    # Flip a random bit of each vector in the population probabilty % of the time


    # Initialize new population after mutation
    # Mutation is the final step, so newPopulation will be the next generation
    newPopulation = []
    for person in crossPopulation:
        # Probability is the chance of performing mutation, usually set to 1 for us
        if random.random() < probability:
            bitToFlip = random.randint(0, len(person) -1)
            if person[bitToFlip] == '0':
                # Python strings are immutable, so we use this workaround instead of directly
modifying 'bits' of person
                newPopulation.append(person[0:bitToFlip] + "1" + person[bitToFlip+1:])
            else:
                newPopulation.append(person[0:bitToFlip] + "0" + person[bitToFlip+1:])
        # If we decided not to do mutation, we just let the candidate move onto the next generation
        else:
            newPopulation.append(person)
    return newPopulation


'''
Section 3: Benchmark Objective Functions
Description:
    1. De Jong Sphere Function
    2. Rosenbrock Valley
    3. Himmelblau Function
```

```
These OFs take a Cartesian coordinate as their input, so decodingAdv() turns the binary input
into cartesian coordinates.

Additional OFs
  of25, of29, of99 from https://cargo.wlu.ca/OFs/2ccMvectorFormat/25-99/
These OFs deal with the 'bits' of the binary vectors directly, so no decoding is neeeded.
strToInts() changes the input from strings to arrays of int to match the code provided.

Parameters: vector = a binary vector
        mode = which OF we are using
        n = the size of the binary vectors divided by two, used for dj, rb, and hb input decoding
Returns:    OF(vector), a real number (dj, rb, hb) or integer (additional OFs)
'''

def objectiveFunction(vector, mode, n):
    # returns De Jong Sphere of vector if mode == 1
    # returns Rosenbrock's Valley of vector if mode == 2
    # returns Himmelblau function of vector if mode == 3
    # returns ofxx (additional OFs from Cargo page) of vector if mode == xx

    if mode == 1:
        listx = decodingAdv(vector, n)
        return deJong(listx)
    if mode == 2:
        listx = decodingAdv(vector, n)
        return rosenbrock(listx)
    if mode == 3:
        listx = decodingAdv(vector, n)
        return himmelblau(listx)
    if mode == 25:
        listx = strToInts(vector)
        return of25(listx)
    if mode == 29:
        listx = strToInts(vector)
        return of29(listx)
    if mode == 99:
        listx = strToInts(vector)
        return of99(listx)
    return


def decodingAdv(vector, n):
    # Decode binary vector into cartesian coordinates.
    # First bit = sign bit, next 15 give a number from 0 to 32767. We then scale this down to (-5,
5)
```

```
    # To get somewhat precise decimal numbers about the global minima of these benchmark
OFs.


    # We take the binary input in blocks of 16 bits.
    blocks = [vector[i:i+n] for i in range(0, len(vector), n)]
    x = []
    for block in blocks:
        if block[0] == "0":
            sign = -1
        else:
            sign = 1


        # Convert the number from binary to integer (0 to 32767)
        # Divide by 32767. Now range is (0,1)
        # Scale up to (0,5). (-5,  5) when the sign bit is multiplied in
        num = (int(block[1:], 2)  / ((2**(n-1)) -1)) * 5
        x.append(sign * num)
        # x is a list of real numbers where each number can be one of 65535 real numbers between
-5 and 5
    return x


def deJong(listx):
    # dj = de Jong Sphere Function of listx.
    dj = 0

    for xi in listx:

        dj += xi ** 2

    return dj


def rosenbrock(listx):

    # rb = Rosenbrock's Valley function of listx.

    rb = 0

    i = 0

    for xi in listx[0:-1]: # up to n - 1

        rb += 100*(((listx[i+1] - (xi**2))**2) + ((1-xi)**2))

    return rb


def himmelblau(listx):

    # x, y = Himmelblau Function of listx.

    # Fixed to two-dimensional inputs.

    if len(listx)> 2:

        print("Himmelblau takes only 2 dimensions of input")

        return -1

    x = listx[0]

    y = listx[1]

    return (x**2 + y - 11)**2 + (x +y**2 -7)**2
```

```
def strToInts(vector):
    x = []
    for bit in vector:
        x.append(int(bit))
    return x

def of25(M):

    of =
abs(M[1]+M[2]+M[3]+M[4]+M[5]+M[6]+M[7]+M[8]+M[9]+M[10]+M[11]+M[12]+M[13]+M[
14]+M[15]+M[16]+M[17]+M[18]+M[19]+M[20]+M[21]+M[22]+M[23]+M[24]+M[25]-1);

    of = of +
abs(M[26]+M[27]+M[28]+M[29]+M[30]+M[31]+M[32]+M[33]+M[34]+M[35]+M[36]+M[37]
+M[38]+M[39]+M[40]+M[41]+M[42]+M[43]+M[44]+M[45]+M[46]+M[47]+M[48]+M[49]+M
[50]-1);

    of = of +
abs(M[1]*M[7]+M[1]*M[20]+M[2]*M[8]+M[2]*M[21]+M[3]*M[9]+M[3]*M[22]+M[4]*M[10
]+M[4]*M[23]+M[5]*M[11]+M[5]*M[24]+M[6]*M[12]+M[6]*M[25]+M[7]*M[13]+M[8]*M[
14]+M[9]*M[15]+M[10]*M[16]+M[11]*M[17]+M[12]*M[18]+M[13]*M[19]+M[14]*M[20]+
M[15]*M[21]+M[16]*M[22]+M[17]*M[23]+M[18]*M[24]+M[19]*M[25]+M[26]*M[32]+M[2
6]*M[45]+M[27]*M[33]+M[27]*M[46]+M[28]*M[34]+M[28]*M[47]+M[29]*M[35]+M[29]*
M[48]+M[30]*M[36]+M[30]*M[49]+M[31]*M[37]+M[31]*M[50]+M[32]*M[38]+M[33]*M[3
9]+M[34]*M[40]+M[35]*M[41]+M[36]*M[42]+M[37]*M[43]+M[38]*M[44]+M[39]*M[45]+
M[40]*M[46]+M[41]*M[47]+M[42]*M[48]+M[43]*M[49]+M[44]*M[50]+2);

   of = of +
abs(M[1]*M[8]+M[1]*M[19]+M[2]*M[9]+M[2]*M[20]+M[3]*M[10]+M[3]*M[21]+M[4]*M[1
1]+M[4]*M[22]+M[5]*M[12]+M[5]*M[23]+M[6]*M[13]+M[6]*M[24]+M[7]*M[14]+M[7]*M
[25]+M[8]*M[15]+M[9]*M[16]+M[10]*M[17]+M[11]*M[18]+M[12]*M[19]+M[13]*M[20]+
M[14]*M[21]+M[15]*M[22]+M[16]*M[23]+M[17]*M[24]+M[18]*M[25]+M[26]*M[33]+M[2
6]*M[44]+M[27]*M[34]+M[27]*M[45]+M[28]*M[35]+M[28]*M[46]+M[29]*M[36]+M[29]*
M[47]+M[30]*M[37]+M[30]*M[48]+M[31]*M[38]+M[31]*M[49]+M[32]*M[39]+M[32]*M[5
0]+M[33]*M[40]+M[34]*M[41]+M[35]*M[42]+M[36]*M[43]+M[37]*M[44]+M[38]*M[45]+
M[39]*M[46]+M[40]*M[47]+M[41]*M[48]+M[42]*M[49]+M[43]*M[50]+2);

   of = of +
abs(M[1]*M[9]+M[1]*M[18]+M[2]*M[10]+M[2]*M[19]+M[3]*M[11]+M[3]*M[20]+M[4]*M[
12]+M[4]*M[21]+M[5]*M[13]+M[5]*M[22]+M[6]*M[14]+M[6]*M[23]+M[7]*M[15]+M[7]*
M[24]+M[8]*M[16]+M[8]*M[25]+M[9]*M[17]+M[10]*M[18]+M[11]*M[19]+M[12]*M[20]+
M[13]*M[21]+M[14]*M[22]+M[15]*M[23]+M[16]*M[24]+M[17]*M[25]+M[26]*M[34]+M[2
6]*M[43]+M[27]*M[35]+M[27]*M[44]+M[28]*M[36]+M[28]*M[45]+M[29]*M[37]+M[29]*
M[46]+M[30]*M[38]+M[30]*M[47]+M[31]*M[39]+M[31]*M[48]+M[32]*M[40]+M[32]*M[4
9]+M[33]*M[41]+M[33]*M[50]+M[34]*M[42]+M[35]*M[43]+M[36]*M[44]+M[37]*M[45]+
M[38]*M[46]+M[39]*M[47]+M[40]*M[48]+M[41]*M[49]+M[42]*M[50]+2);
```

```
  of = of +
abs(M[1]*M[10]+M[1]*M[17]+M[2]*M[11]+M[2]*M[18]+M[3]*M[12]+M[3]*M[19]+M[4]*
M[13]+M[4]*M[20]+M[5]*M[14]+M[5]*M[21]+M[6]*M[15]+M[6]*M[22]+M[7]*M[16]+M[7
]*M[23]+M[8]*M[17]+M[8]*M[24]+M[9]*M[18]+M[9]*M[25]+M[10]*M[19]+M[11]*M[20]+
M[12]*M[21]+M[13]*M[22]+M[14]*M[23]+M[15]*M[24]+M[16]*M[25]+M[26]*M[35]+M[2
6]*M[42]+M[27]*M[36]+M[27]*M[43]+M[28]*M[37]+M[28]*M[44]+M[29]*M[38]+M[29]*
M[45]+M[30]*M[39]+M[30]*M[46]+M[31]*M[40]+M[31]*M[47]+M[32]*M[41]+M[32]*M[4
8]+M[33]*M[42]+M[33]*M[49]+M[34]*M[43]+M[34]*M[50]+M[35]*M[44]+M[36]*M[45]+
M[37]*M[46]+M[38]*M[47]+M[39]*M[48]+M[40]*M[49]+M[41]*M[50]+2);

  of = of +
abs(M[1]*M[11]+M[1]*M[16]+M[2]*M[12]+M[2]*M[17]+M[3]*M[13]+M[3]*M[18]+M[4]*
M[14]+M[4]*M[19]+M[5]*M[15]+M[5]*M[20]+M[6]*M[16]+M[6]*M[21]+M[7]*M[17]+M[7
]*M[22]+M[8]*M[18]+M[8]*M[23]+M[9]*M[19]+M[9]*M[24]+M[10]*M[20]+M[10]*M[25]+
M[11]*M[21]+M[12]*M[22]+M[13]*M[23]+M[14]*M[24]+M[15]*M[25]+M[26]*M[36]+M[2
6]*M[41]+M[27]*M[37]+M[27]*M[42]+M[28]*M[38]+M[28]*M[43]+M[29]*M[39]+M[29]*
M[44]+M[30]*M[40]+M[30]*M[45]+M[31]*M[41]+M[31]*M[46]+M[32]*M[42]+M[32]*M[4
7]+M[33]*M[43]+M[33]*M[48]+M[34]*M[44]+M[34]*M[49]+M[35]*M[45]+M[35]*M[50]+
M[36]*M[46]+M[37]*M[47]+M[38]*M[48]+M[39]*M[49]+M[40]*M[50]+2);

  of = of +
abs(M[1]*M[12]+M[1]*M[15]+M[2]*M[13]+M[2]*M[16]+M[3]*M[14]+M[3]*M[17]+M[4]*
M[15]+M[4]*M[18]+M[5]*M[16]+M[5]*M[19]+M[6]*M[17]+M[6]*M[20]+M[7]*M[18]+M[7
]*M[21]+M[8]*M[19]+M[8]*M[22]+M[9]*M[20]+M[9]*M[23]+M[10]*M[21]+M[10]*M[24]+
M[11]*M[22]+M[11]*M[25]+M[12]*M[23]+M[13]*M[24]+M[14]*M[25]+M[26]*M[37]+M[2
6]*M[40]+M[27]*M[38]+M[27]*M[41]+M[28]*M[39]+M[28]*M[42]+M[29]*M[40]+M[29]*
M[43]+M[30]*M[41]+M[30]*M[44]+M[31]*M[42]+M[31]*M[45]+M[32]*M[43]+M[32]*M[4
6]+M[33]*M[44]+M[33]*M[47]+M[34]*M[45]+M[34]*M[48]+M[35]*M[46]+M[35]*M[49]+
M[36]*M[47]+M[36]*M[50]+M[37]*M[48]+M[38]*M[49]+M[39]*M[50]+2);

   of = of +
abs(M[1]*M[13]+M[1]*M[14]+M[2]*M[14]+M[2]*M[15]+M[3]*M[15]+M[3]*M[16]+M[4]*
M[16]+M[4]*M[17]+M[5]*M[17]+M[5]*M[18]+M[6]*M[18]+M[6]*M[19]+M[7]*M[19]+M[7
]*M[20]+M[8]*M[20]+M[8]*M[21]+M[9]*M[21]+M[9]*M[22]+M[10]*M[22]+M[10]*M[23]+
M[11]*M[23]+M[11]*M[24]+M[12]*M[24]+M[12]*M[25]+M[13]*M[25]+M[26]*M[38]+M[2
6]*M[39]+M[27]*M[39]+M[27]*M[40]+M[28]*M[40]+M[28]*M[41]+M[29]*M[41]+M[29]*
M[42]+M[30]*M[42]+M[30]*M[43]+M[31]*M[43]+M[31]*M[44]+M[32]*M[44]+M[32]*M[4
5]+M[33]*M[45]+M[33]*M[46]+M[34]*M[46]+M[34]*M[47]+M[35]*M[47]+M[35]*M[48]+
M[36]*M[48]+M[36]*M[49]+M[37]*M[49]+M[37]*M[50]+M[38]*M[50]+2);

   of = of +
abs(M[1]*M[5]+M[1]*M[22]+M[2]*M[6]+M[2]*M[23]+M[3]*M[7]+M[3]*M[24]+M[4]*M[8]
+M[4]*M[25]+M[5]*M[9]+M[6]*M[10]+M[7]*M[11]+M[8]*M[12]+M[9]*M[13]+M[10]*M[1
4]+M[11]*M[15]+M[12]*M[16]+M[13]*M[17]+M[14]*M[18]+M[15]*M[19]+M[16]*M[20]+
M[17]*M[21]+M[18]*M[22]+M[19]*M[23]+M[20]*M[24]+M[21]*M[25]+M[26]*M[30]+M[2
```

```
6]*M[47]+M[27]*M[31]+M[27]*M[48]+M[28]*M[32]+M[28]*M[49]+M[29]*M[33]+M[29]*
M[50]+M[30]*M[34]+M[31]*M[35]+M[32]*M[36]+M[33]*M[37]+M[34]*M[38]+M[35]*M[3
9]+M[36]*M[40]+M[37]*M[41]+M[38]*M[42]+M[39]*M[43]+M[40]*M[44]+M[41]*M[45]+
M[42]*M[46]+M[43]*M[47]+M[44]*M[48]+M[45]*M[49]+M[46]*M[50]+2);

   of = of +
abs(M[1]*M[2]+M[1]*M[25]+M[2]*M[3]+M[3]*M[4]+M[4]*M[5]+M[5]*M[6]+M[6]*M[7]+
M[7]*M[8]+M[8]*M[9]+M[9]*M[10]+M[10]*M[11]+M[11]*M[12]+M[12]*M[13]+M[13]*M[
14]+M[14]*M[15]+M[15]*M[16]+M[16]*M[17]+M[17]*M[18]+M[18]*M[19]+M[19]*M[20]+
M[20]*M[21]+M[21]*M[22]+M[22]*M[23]+M[23]*M[24]+M[24]*M[25]+M[26]*M[27]+M[2
6]*M[50]+M[27]*M[28]+M[28]*M[29]+M[29]*M[30]+M[30]*M[31]+M[31]*M[32]+M[32]*
M[33]+M[33]*M[34]+M[34]*M[35]+M[35]*M[36]+M[36]*M[37]+M[37]*M[38]+M[38]*M[3
9]+M[39]*M[40]+M[40]*M[41]+M[41]*M[42]+M[42]*M[43]+M[43]*M[44]+M[44]*M[45]+
M[45]*M[46]+M[46]*M[47]+M[47]*M[48]+M[48]*M[49]+M[49]*M[50]+2);

   of = of +
abs(M[1]*M[3]+M[1]*M[24]+M[2]*M[4]+M[2]*M[25]+M[3]*M[5]+M[4]*M[6]+M[5]*M[7]+
M[6]*M[8]+M[7]*M[9]+M[8]*M[10]+M[9]*M[11]+M[10]*M[12]+M[11]*M[13]+M[12]*M[1
4]+M[13]*M[15]+M[14]*M[16]+M[15]*M[17]+M[16]*M[18]+M[17]*M[19]+M[18]*M[20]+
M[19]*M[21]+M[20]*M[22]+M[21]*M[23]+M[22]*M[24]+M[23]*M[25]+M[26]*M[28]+M[2
6]*M[49]+M[27]*M[29]+M[27]*M[50]+M[28]*M[30]+M[29]*M[31]+M[30]*M[32]+M[31]*
M[33]+M[32]*M[34]+M[33]*M[35]+M[34]*M[36]+M[35]*M[37]+M[36]*M[38]+M[37]*M[3
```

```
9]+M[38]*M[40]+M[39]*M[41]+M[40]*M[42]+M[41]*M[43]+M[42]*M[44]+M[43]*M[45]+
M[44]*M[46]+M[45]*M[47]+M[46]*M[48]+M[47]*M[49]+M[48]*M[50]+2);

    of = of +
abs(M[1]*M[4]+M[1]*M[23]+M[2]*M[5]+M[2]*M[24]+M[3]*M[6]+M[3]*M[25]+M[4]*M[7]
+M[5]*M[8]+M[6]*M[9]+M[7]*M[10]+M[8]*M[11]+M[9]*M[12]+M[10]*M[13]+M[11]*M[1
4]+M[12]*M[15]+M[13]*M[16]+M[14]*M[17]+M[15]*M[18]+M[16]*M[19]+M[17]*M[20]+
M[18]*M[21]+M[19]*M[22]+M[20]*M[23]+M[21]*M[24]+M[22]*M[25]+M[26]*M[29]+M[2
6]*M[48]+M[27]*M[30]+M[27]*M[49]+M[28]*M[31]+M[28]*M[50]+M[29]*M[32]+M[30]*
M[33]+M[31]*M[34]+M[32]*M[35]+M[33]*M[36]+M[34]*M[37]+M[35]*M[38]+M[36]*M[3
9]+M[37]*M[40]+M[38]*M[41]+M[39]*M[42]+M[40]*M[43]+M[41]*M[44]+M[42]*M[45]+
M[43]*M[46]+M[44]*M[47]+M[45]*M[48]+M[46]*M[49]+M[47]*M[50]+2);

    of = of +
abs(M[1]*M[6]+M[1]*M[21]+M[2]*M[7]+M[2]*M[22]+M[3]*M[8]+M[3]*M[23]+M[4]*M[9]
+M[4]*M[24]+M[5]*M[10]+M[5]*M[25]+M[6]*M[11]+M[7]*M[12]+M[8]*M[13]+M[9]*M[1
4]+M[10]*M[15]+M[11]*M[16]+M[12]*M[17]+M[13]*M[18]+M[14]*M[19]+M[15]*M[20]+
M[16]*M[21]+M[17]*M[22]+M[18]*M[23]+M[19]*M[24]+M[20]*M[25]+M[26]*M[31]+M[2
6]*M[46]+M[27]*M[32]+M[27]*M[47]+M[28]*M[33]+M[28]*M[48]+M[29]*M[34]+M[29]*
M[49]+M[30]*M[35]+M[30]*M[50]+M[31]*M[36]+M[32]*M[37]+M[33]*M[38]+M[34]*M[3
9]+M[35]*M[40]+M[36]*M[41]+M[37]*M[42]+M[38]*M[43]+M[39]*M[44]+M[40]*M[45]+
M[41]*M[46]+M[42]*M[47]+M[43]*M[48]+M[44]*M[49]+M[45]*M[50]+2);
    return of
```

```
def of29(M):
    of =
abs(M[1]+M[2]+M[3]+M[4]+M[5]+M[6]+M[7]+M[8]+M[9]+M[10]+M[11]+M[12]+M[13]+M[
14]+M[15]+M[16]+M[17]+M[18]+M[19]+M[20]+M[21]+M[22]+M[23]+M[24]+M[25]+M[26]
+M[27]+M[28]+M[29]-1);

    of = of +
abs(M[30]+M[31]+M[32]+M[33]+M[34]+M[35]+M[36]+M[37]+M[38]+M[39]+M[40]+M[41]
+M[42]+M[43]+M[44]+M[45]+M[46]+M[47]+M[48]+M[49]+M[50]+M[51]+M[52]+M[53]+M
[54]+M[55]+M[56]+M[57]+M[58]-1);

    of = of +
abs(M[1]*M[11]+M[1]*M[20]+M[2]*M[12]+M[2]*M[21]+M[3]*M[13]+M[3]*M[22]+M[4]*
M[14]+M[4]*M[23]+M[5]*M[15]+M[5]*M[24]+M[6]*M[16]+M[6]*M[25]+M[7]*M[17]+M[7
]*M[26]+M[8]*M[18]+M[8]*M[27]+M[9]*M[19]+M[9]*M[28]+M[10]*M[20]+M[10]*M[29]+
M[11]*M[21]+M[12]*M[22]+M[13]*M[23]+M[14]*M[24]+M[15]*M[25]+M[16]*M[26]+M[1
7]*M[27]+M[18]*M[28]+M[19]*M[29]+M[30]*M[40]+M[30]*M[49]+M[31]*M[41]+M[31]*
M[50]+M[32]*M[42]+M[32]*M[51]+M[33]*M[43]+M[33]*M[52]+M[34]*M[44]+M[34]*M[5
3]+M[35]*M[45]+M[35]*M[54]+M[36]*M[46]+M[36]*M[55]+M[37]*M[47]+M[37]*M[56]+
M[38]*M[48]+M[38]*M[57]+M[39]*M[49]+M[39]*M[58]+M[40]*M[50]+M[41]*M[51]+M[4
2]*M[52]+M[43]*M[53]+M[44]*M[54]+M[45]*M[55]+M[46]*M[56]+M[47]*M[57]+M[48]*
M[58]+2);
```

```
   of = of +
abs(M[1]*M[10]+M[1]*M[21]+M[2]*M[11]+M[2]*M[22]+M[3]*M[12]+M[3]*M[23]+M[4]*
M[13]+M[4]*M[24]+M[5]*M[14]+M[5]*M[25]+M[6]*M[15]+M[6]*M[26]+M[7]*M[16]+M[7
]*M[27]+M[8]*M[17]+M[8]*M[28]+M[9]*M[18]+M[9]*M[29]+M[10]*M[19]+M[11]*M[20]+
M[12]*M[21]+M[13]*M[22]+M[14]*M[23]+M[15]*M[24]+M[16]*M[25]+M[17]*M[26]+M[1
8]*M[27]+M[19]*M[28]+M[20]*M[29]+M[30]*M[39]+M[30]*M[50]+M[31]*M[40]+M[31]*
M[51]+M[32]*M[41]+M[32]*M[52]+M[33]*M[42]+M[33]*M[53]+M[34]*M[43]+M[34]*M[5
4]+M[35]*M[44]+M[35]*M[55]+M[36]*M[45]+M[36]*M[56]+M[37]*M[46]+M[37]*M[57]+
M[38]*M[47]+M[38]*M[58]+M[39]*M[48]+M[40]*M[49]+M[41]*M[50]+M[42]*M[51]+M[4
3]*M[52]+M[44]*M[53]+M[45]*M[54]+M[46]*M[55]+M[47]*M[56]+M[48]*M[57]+M[49]*
M[58]+2);

   of = of +
abs(M[1]*M[12]+M[1]*M[19]+M[2]*M[13]+M[2]*M[20]+M[3]*M[14]+M[3]*M[21]+M[4]*
M[15]+M[4]*M[22]+M[5]*M[16]+M[5]*M[23]+M[6]*M[17]+M[6]*M[24]+M[7]*M[18]+M[7
]*M[25]+M[8]*M[19]+M[8]*M[26]+M[9]*M[20]+M[9]*M[27]+M[10]*M[21]+M[10]*M[28]+
M[11]*M[22]+M[11]*M[29]+M[12]*M[23]+M[13]*M[24]+M[14]*M[25]+M[15]*M[26]+M[1
6]*M[27]+M[17]*M[28]+M[18]*M[29]+M[30]*M[41]+M[30]*M[48]+M[31]*M[42]+M[31]*
M[49]+M[32]*M[43]+M[32]*M[50]+M[33]*M[44]+M[33]*M[51]+M[34]*M[45]+M[34]*M[5
2]+M[35]*M[46]+M[35]*M[53]+M[36]*M[47]+M[36]*M[54]+M[37]*M[48]+M[37]*M[55]+
M[38]*M[49]+M[38]*M[56]+M[39]*M[50]+M[39]*M[57]+M[40]*M[51]+M[40]*M[58]+M[4
```

1]*M[52]+M[42]*M[53]+M[43]*M[54]+M[44]*M[55]+M[45]*M[56]+M[46]*M[57]+M[47]*M[58]+2);

of = of + abs(M[1]*M[15]+M[1]*M[16]+M[2]*M[16]+M[2]*M[17]+M[3]*M[17]+M[3]*M[18]+M[4]*M[18]+M[4]*M[19]+M[5]*M[19]+M[5]*M[20]+M[6]*M[20]+M[6]*M[21]+M[7]*M[21]+M[7]*M[22]+M[8]*M[22]+M[8]*M[23]+M[9]*M[23]+M[9]*M[24]+M[10]*M[24]+M[10]*M[25]+M[11]*M[25]+M[11]*M[26]+M[12]*M[26]+M[12]*M[27]+M[13]*M[27]+M[13]*M[28]+M[14]*M[28]+M[14]*M[29]+M[15]*M[29]+M[30]*M[44]+M[30]*M[45]+M[31]*M[45]+M[31]*M[46]+M[32]*M[46]+M[32]*M[47]+M[33]*M[47]+M[33]*M[48]+M[34]*M[48]+M[34]*M[49]+M[35]*M[49]+M[35]*M[50]+M[36]*M[50]+M[36]*M[51]+M[37]*M[51]+M[37]*M[52]+M[38]*M[52]+M[38]*M[53]+M[39]*M[53]+M[39]*M[54]+M[40]*M[54]+M[40]*M[55]+M[41]*M[55]+M[41]*M[56]+M[42]*M[56]+M[42]*M[57]+M[43]*M[57]+M[43]*M[58]+M[44]*M[58]+2);

of = of + abs(M[1]*M[14]+M[1]*M[17]+M[2]*M[15]+M[2]*M[18]+M[3]*M[16]+M[3]*M[19]+M[4]*M[17]+M[4]*M[20]+M[5]*M[18]+M[5]*M[21]+M[6]*M[19]+M[6]*M[22]+M[7]*M[20]+M[7]*M[23]+M[8]*M[21]+M[8]*M[24]+M[9]*M[22]+M[9]*M[25]+M[10]*M[23]+M[10]*M[26]+M[11]*M[24]+M[11]*M[27]+M[12]*M[25]+M[12]*M[28]+M[13]*M[26]+M[13]*M[29]+M[14]*M[27]+M[15]*M[28]+M[16]*M[29]+M[30]*M[43]+M[30]*M[46]+M[31]*M[44]+M[31]*M[47]+M[32]*M[45]+M[32]*M[48]+M[33]*M[46]+M[33]*M[49]+M[34]*M[47]+M[34]*M[50]+M[35]*M[48]+M[35]*M[51]+M[36]*M[49]+M[36]*M[52]+M[37]*M[50]+M[37]*M[53]+

```
M[38]*M[51]+M[38]*M[54]+M[39]*M[52]+M[39]*M[55]+M[40]*M[53]+M[40]*M[56]+M[4
1]*M[54]+M[41]*M[57]+M[42]*M[55]+M[42]*M[58]+M[43]*M[56]+M[44]*M[57]+M[45]*
M[58]+2);

   of = of +
abs(M[1]*M[13]+M[1]*M[18]+M[2]*M[14]+M[2]*M[19]+M[3]*M[15]+M[3]*M[20]+M[4]*
M[16]+M[4]*M[21]+M[5]*M[17]+M[5]*M[22]+M[6]*M[18]+M[6]*M[23]+M[7]*M[19]+M[7
]*M[24]+M[8]*M[20]+M[8]*M[25]+M[9]*M[21]+M[9]*M[26]+M[10]*M[22]+M[10]*M[27]+
M[11]*M[23]+M[11]*M[28]+M[12]*M[24]+M[12]*M[29]+M[13]*M[25]+M[14]*M[26]+M[1
5]*M[27]+M[16]*M[28]+M[17]*M[29]+M[30]*M[42]+M[30]*M[47]+M[31]*M[43]+M[31]*
M[48]+M[32]*M[44]+M[32]*M[49]+M[33]*M[45]+M[33]*M[50]+M[34]*M[46]+M[34]*M[5
1]+M[35]*M[47]+M[35]*M[52]+M[36]*M[48]+M[36]*M[53]+M[37]*M[49]+M[37]*M[54]+
M[38]*M[50]+M[38]*M[55]+M[39]*M[51]+M[39]*M[56]+M[40]*M[52]+M[40]*M[57]+M[4
1]*M[53]+M[41]*M[58]+M[42]*M[54]+M[43]*M[55]+M[44]*M[56]+M[45]*M[57]+M[46]*
M[58]+2);

   of = of +
abs(M[1]*M[2]+M[1]*M[29]+M[2]*M[3]+M[3]*M[4]+M[4]*M[5]+M[5]*M[6]+M[6]*M[7]+
M[7]*M[8]+M[8]*M[9]+M[9]*M[10]+M[10]*M[11]+M[11]*M[12]+M[12]*M[13]+M[13]*M[
14]+M[14]*M[15]+M[15]*M[16]+M[16]*M[17]+M[17]*M[18]+M[18]*M[19]+M[19]*M[20]+
M[20]*M[21]+M[21]*M[22]+M[22]*M[23]+M[23]*M[24]+M[24]*M[25]+M[25]*M[26]+M[2
6]*M[27]+M[27]*M[28]+M[28]*M[29]+M[30]*M[31]+M[30]*M[58]+M[31]*M[32]+M[32]*
M[33]+M[33]*M[34]+M[34]*M[35]+M[35]*M[36]+M[36]*M[37]+M[37]*M[38]+M[38]*M[3
9]+M[39]*M[40]+M[40]*M[41]+M[41]*M[42]+M[42]*M[43]+M[43]*M[44]+M[44]*M[45]+
M[45]*M[46]+M[46]*M[47]+M[47]*M[48]+M[48]*M[49]+M[49]*M[50]+M[50]*M[51]+M[5
1]*M[52]+M[52]*M[53]+M[53]*M[54]+M[54]*M[55]+M[55]*M[56]+M[56]*M[57]+M[57]*
M[58]+2);

   of = of +
abs(M[1]*M[3]+M[1]*M[28]+M[2]*M[4]+M[2]*M[29]+M[3]*M[5]+M[4]*M[6]+M[5]*M[7]+
M[6]*M[8]+M[7]*M[9]+M[8]*M[10]+M[9]*M[11]+M[10]*M[12]+M[11]*M[13]+M[12]*M[1
4]+M[13]*M[15]+M[14]*M[16]+M[15]*M[17]+M[16]*M[18]+M[17]*M[19]+M[18]*M[20]+
M[19]*M[21]+M[20]*M[22]+M[21]*M[23]+M[22]*M[24]+M[23]*M[25]+M[24]*M[26]+M[2
5]*M[27]+M[26]*M[28]+M[27]*M[29]+M[30]*M[32]+M[30]*M[57]+M[31]*M[33]+M[31]*
M[58]+M[32]*M[34]+M[33]*M[35]+M[34]*M[36]+M[35]*M[37]+M[36]*M[38]+M[37]*M[3
9]+M[38]*M[40]+M[39]*M[41]+M[40]*M[42]+M[41]*M[43]+M[42]*M[44]+M[43]*M[45]+
M[44]*M[46]+M[45]*M[47]+M[46]*M[48]+M[47]*M[49]+M[48]*M[50]+M[49]*M[51]+M[5
0]*M[52]+M[51]*M[53]+M[52]*M[54]+M[53]*M[55]+M[54]*M[56]+M[55]*M[57]+M[56]*
M[58]+2);

   of = of +
abs(M[1]*M[4]+M[1]*M[27]+M[2]*M[5]+M[2]*M[28]+M[3]*M[6]+M[3]*M[29]+M[4]*M[7]
+M[5]*M[8]+M[6]*M[9]+M[7]*M[10]+M[8]*M[11]+M[9]*M[12]+M[10]*M[13]+M[11]*M[1
4]+M[12]*M[15]+M[13]*M[16]+M[14]*M[17]+M[15]*M[18]+M[16]*M[19]+M[17]*M[20]+
M[18]*M[21]+M[19]*M[22]+M[20]*M[23]+M[21]*M[24]+M[22]*M[25]+M[23]*M[26]+M[2
4]*M[27]+M[25]*M[28]+M[26]*M[29]+M[30]*M[33]+M[30]*M[56]+M[31]*M[34]+M[31]*
```

```
M[57]+M[32]*M[35]+M[32]*M[58]+M[33]*M[36]+M[34]*M[37]+M[35]*M[38]+M[36]*M[3
9]+M[37]*M[40]+M[38]*M[41]+M[39]*M[42]+M[40]*M[43]+M[41]*M[44]+M[42]*M[45]+
M[43]*M[46]+M[44]*M[47]+M[45]*M[48]+M[46]*M[49]+M[47]*M[50]+M[48]*M[51]+M[4
9]*M[52]+M[50]*M[53]+M[51]*M[54]+M[52]*M[55]+M[53]*M[56]+M[54]*M[57]+M[55]*
M[58]+2);

  of = of +
abs(M[1]*M[5]+M[1]*M[26]+M[2]*M[6]+M[2]*M[27]+M[3]*M[7]+M[3]*M[28]+M[4]*M[8]
+M[4]*M[29]+M[5]*M[9]+M[6]*M[10]+M[7]*M[11]+M[8]*M[12]+M[9]*M[13]+M[10]*M[1
4]+M[11]*M[15]+M[12]*M[16]+M[13]*M[17]+M[14]*M[18]+M[15]*M[19]+M[16]*M[20]+
M[17]*M[21]+M[18]*M[22]+M[19]*M[23]+M[20]*M[24]+M[21]*M[25]+M[22]*M[26]+M[2
3]*M[27]+M[24]*M[28]+M[25]*M[29]+M[30]*M[34]+M[30]*M[55]+M[31]*M[35]+M[31]*
M[56]+M[32]*M[36]+M[32]*M[57]+M[33]*M[37]+M[33]*M[58]+M[34]*M[38]+M[35]*M[3
9]+M[36]*M[40]+M[37]*M[41]+M[38]*M[42]+M[39]*M[43]+M[40]*M[44]+M[41]*M[45]+
M[42]*M[46]+M[43]*M[47]+M[44]*M[48]+M[45]*M[49]+M[46]*M[50]+M[47]*M[51]+M[4
8]*M[52]+M[49]*M[53]+M[50]*M[54]+M[51]*M[55]+M[52]*M[56]+M[53]*M[57]+M[54]*
M[58]+2);

  of = of +
abs(M[1]*M[6]+M[1]*M[25]+M[2]*M[7]+M[2]*M[26]+M[3]*M[8]+M[3]*M[27]+M[4]*M[9]
+M[4]*M[28]+M[5]*M[10]+M[5]*M[29]+M[6]*M[11]+M[7]*M[12]+M[8]*M[13]+M[9]*M[1
4]+M[10]*M[15]+M[11]*M[16]+M[12]*M[17]+M[13]*M[18]+M[14]*M[19]+M[15]*M[20]+
M[16]*M[21]+M[17]*M[22]+M[18]*M[23]+M[19]*M[24]+M[20]*M[25]+M[21]*M[26]+M[2
2]*M[27]+M[23]*M[28]+M[24]*M[29]+M[30]*M[35]+M[30]*M[54]+M[31]*M[36]+M[31]*
M[55]+M[32]*M[37]+M[32]*M[56]+M[33]*M[38]+M[33]*M[57]+M[34]*M[39]+M[34]*M[5
8]+M[35]*M[40]+M[36]*M[41]+M[37]*M[42]+M[38]*M[43]+M[39]*M[44]+M[40]*M[45]+
M[41]*M[46]+M[42]*M[47]+M[43]*M[48]+M[44]*M[49]+M[45]*M[50]+M[46]*M[51]+M[4
7]*M[52]+M[48]*M[53]+M[49]*M[54]+M[50]*M[55]+M[51]*M[56]+M[52]*M[57]+M[53]*
M[58]+2);

  of = of +
abs(M[1]*M[7]+M[1]*M[24]+M[2]*M[8]+M[2]*M[25]+M[3]*M[9]+M[3]*M[26]+M[4]*M[10
]+M[4]*M[27]+M[5]*M[11]+M[5]*M[28]+M[6]*M[12]+M[6]*M[29]+M[7]*M[13]+M[8]*M[
14]+M[9]*M[15]+M[10]*M[16]+M[11]*M[17]+M[12]*M[18]+M[13]*M[19]+M[14]*M[20]+
M[15]*M[21]+M[16]*M[22]+M[17]*M[23]+M[18]*M[24]+M[19]*M[25]+M[20]*M[26]+M[2
1]*M[27]+M[22]*M[28]+M[23]*M[29]+M[30]*M[36]+M[30]*M[53]+M[31]*M[37]+M[31]*
M[54]+M[32]*M[38]+M[32]*M[55]+M[33]*M[39]+M[33]*M[56]+M[34]*M[40]+M[34]*M[5
7]+M[35]*M[41]+M[35]*M[58]+M[36]*M[42]+M[37]*M[43]+M[38]*M[44]+M[39]*M[45]+
M[40]*M[46]+M[41]*M[47]+M[42]*M[48]+M[43]*M[49]+M[44]*M[50]+M[45]*M[51]+M[4
6]*M[52]+M[47]*M[53]+M[48]*M[54]+M[49]*M[55]+M[50]*M[56]+M[51]*M[57]+M[52]*
M[58]+2);

  of = of +
abs(M[1]*M[8]+M[1]*M[23]+M[2]*M[9]+M[2]*M[24]+M[3]*M[10]+M[3]*M[25]+M[4]*M[1
1]+M[4]*M[26]+M[5]*M[12]+M[5]*M[27]+M[6]*M[13]+M[6]*M[28]+M[7]*M[14]+M[7]*M
[29]+M[8]*M[15]+M[9]*M[16]+M[10]*M[17]+M[11]*M[18]+M[12]*M[19]+M[13]*M[20]+
M[14]*M[21]+M[15]*M[22]+M[16]*M[23]+M[17]*M[24]+M[18]*M[25]+M[19]*M[26]+M[2
0]*M[27]+M[21]*M[28]+M[22]*M[29]+M[30]*M[37]+M[30]*M[52]+M[31]*M[38]+M[31]*
M[53]+M[32]*M[39]+M[32]*M[54]+M[33]*M[40]+M[33]*M[55]+M[34]*M[41]+M[34]*M[5
6]+M[35]*M[42]+M[35]*M[57]+M[36]*M[43]+M[36]*M[58]+M[37]*M[44]+M[38]*M[45]+
M[39]*M[46]+M[40]*M[47]+M[41]*M[48]+M[42]*M[49]+M[43]*M[50]+M[44]*M[51]+M[4
5]*M[52]+M[46]*M[53]+M[47]*M[54]+M[48]*M[55]+M[49]*M[56]+M[50]*M[57]+M[51]*
M[58]+2);

   of = of +
abs(M[1]*M[9]+M[1]*M[22]+M[2]*M[10]+M[2]*M[23]+M[3]*M[11]+M[3]*M[24]+M[4]*M[
12]+M[4]*M[25]+M[5]*M[13]+M[5]*M[26]+M[6]*M[14]+M[6]*M[27]+M[7]*M[15]+M[7]*
M[28]+M[8]*M[16]+M[8]*M[29]+M[9]*M[17]+M[10]*M[18]+M[11]*M[19]+M[12]*M[20]+
M[13]*M[21]+M[14]*M[22]+M[15]*M[23]+M[16]*M[24]+M[17]*M[25]+M[18]*M[26]+M[1
9]*M[27]+M[20]*M[28]+M[21]*M[29]+M[30]*M[38]+M[30]*M[51]+M[31]*M[39]+M[31]*
M[52]+M[32]*M[40]+M[32]*M[53]+M[33]*M[41]+M[33]*M[54]+M[34]*M[42]+M[34]*M[5
5]+M[35]*M[43]+M[35]*M[56]+M[36]*M[44]+M[36]*M[57]+M[37]*M[45]+M[37]*M[58]+
M[38]*M[46]+M[39]*M[47]+M[40]*M[48]+M[41]*M[49]+M[42]*M[50]+M[43]*M[51]+M[4
4]*M[52]+M[45]*M[53]+M[46]*M[54]+M[47]*M[55]+M[48]*M[56]+M[49]*M[57]+M[50]*
M[58]+2);
   return of

def of99(M):
```

```
of =
abs(M[1]+M[2]+M[3]+M[4]+M[5]+M[6]+M[7]+M[8]+M[9]+M[10]+M[11]+M[12]+M[13]+M[
14]+M[15]+M[16]+M[17]+M[18]+M[19]+M[20]+M[21]+M[22]+M[23]+M[24]+M[25]+M[26]
+M[27]+M[28]+M[29]+M[30]+M[31]+M[32]+M[33]+M[34]+M[35]+M[36]+M[37]+M[38]+M
[39]+M[40]+M[41]+M[42]+M[43]+M[44]+M[45]+M[46]+M[47]+M[48]+M[49]+M[50]+M[51
]+M[52]+M[53]+M[54]+M[55]+M[56]+M[57]+M[58]+M[59]+M[60]+M[61]+M[62]+M[63]+
M[64]+M[65]+M[66]+M[67]+M[68]+M[69]+M[70]+M[71]+M[72]+M[73]+M[74]+M[75]+M[
76]+M[77]+M[78]+M[79]+M[80]+M[81]+M[82]+M[83]+M[84]+M[85]+M[86]+M[87]+M[88]
+M[89]+M[90]+M[91]+M[92]+M[93]+M[94]+M[95]+M[96]+M[97]+M[98]+M[99]-1);

of = of +
abs(M[100]+M[101]+M[102]+M[103]+M[104]+M[105]+M[106]+M[107]+M[108]+M[109]+M
[110]+M[111]+M[112]+M[113]+M[114]+M[115]+M[116]+M[117]+M[118]+M[119]+M[120]+
M[121]+M[122]+M[123]+M[124]+M[125]+M[126]+M[127]+M[128]+M[129]+M[130]+M[131
]+M[132]+M[133]+M[134]+M[135]+M[136]+M[137]+M[138]+M[139]+M[140]+M[141]+M[1
42]+M[143]+M[144]+M[145]+M[146]+M[147]+M[148]+M[149]+M[150]+M[151]+M[152]+M
[153]+M[154]+M[155]+M[156]+M[157]+M[158]+M[159]+M[160]+M[161]+M[162]+M[163]+
M[164]+M[165]+M[166]+M[167]+M[168]+M[169]+M[170]+M[171]+M[172]+M[173]+M[174
]+M[175]+M[176]+M[177]+M[178]+M[179]+M[180]+M[181]+M[182]+M[183]+M[184]+M[1
85]+M[186]+M[187]+M[188]+M[189]+M[190]+M[191]+M[192]+M[193]+M[194]+M[195]+M
[196]+M[197]+M[198]-1);
```

```
    of = of +
abs(M[1]*M[46]+M[1]*M[55]+M[2]*M[47]+M[2]*M[56]+M[3]*M[48]+M[3]*M[57]+M[4]*
M[49]+M[4]*M[58]+M[5]*M[50]+M[5]*M[59]+M[6]*M[51]+M[6]*M[60]+M[7]*M[52]+M[7
]*M[61]+M[8]*M[53]+M[8]*M[62]+M[9]*M[54]+M[9]*M[63]+M[10]*M[55]+M[10]*M[64]+
M[11]*M[56]+M[11]*M[65]+M[12]*M[57]+M[12]*M[66]+M[13]*M[58]+M[13]*M[67]+M[1
4]*M[59]+M[14]*M[68]+M[15]*M[60]+M[15]*M[69]+M[16]*M[61]+M[16]*M[70]+M[17]*
M[62]+M[17]*M[71]+M[18]*M[63]+M[18]*M[72]+M[19]*M[64]+M[19]*M[73]+M[20]*M[6
5]+M[20]*M[74]+M[21]*M[66]+M[21]*M[75]+M[22]*M[67]+M[22]*M[76]+M[23]*M[68]+
M[23]*M[77]+M[24]*M[69]+M[24]*M[78]+M[25]*M[70]+M[25]*M[79]+M[26]*M[71]+M[2
6]*M[80]+M[27]*M[72]+M[27]*M[81]+M[28]*M[73]+M[28]*M[82]+M[29]*M[74]+M[29]*
M[83]+M[30]*M[75]+M[30]*M[84]+M[31]*M[76]+M[31]*M[85]+M[32]*M[77]+M[32]*M[8
6]+M[33]*M[78]+M[33]*M[87]+M[34]*M[79]+M[34]*M[88]+M[35]*M[80]+M[35]*M[89]+
M[36]*M[81]+M[36]*M[90]+M[37]*M[82]+M[37]*M[91]+M[38]*M[83]+M[38]*M[92]+M[3
9]*M[84]+M[39]*M[93]+M[40]*M[85]+M[40]*M[94]+M[41]*M[86]+M[41]*M[95]+M[42]*
M[87]+M[42]*M[96]+M[43]*M[88]+M[43]*M[97]+M[44]*M[89]+M[44]*M[98]+M[45]*M[9
0]+M[45]*M[99]+M[46]*M[91]+M[47]*M[92]+M[48]*M[93]+M[49]*M[94]+M[50]*M[95]+
M[51]*M[96]+M[52]*M[97]+M[53]*M[98]+M[54]*M[99]+M[100]*M[145]+M[100]*M[154]
+M[101]*M[146]+M[101]*M[155]+M[102]*M[147]+M[102]*M[156]+M[103]*M[148]+M[10
3]*M[157]+M[104]*M[149]+M[104]*M[158]+M[105]*M[150]+M[105]*M[159]+M[106]*M[1
51]+M[106]*M[160]+M[107]*M[152]+M[107]*M[161]+M[108]*M[153]+M[108]*M[162]+M[
109]*M[154]+M[109]*M[163]+M[110]*M[155]+M[110]*M[164]+M[111]*M[156]+M[111]*M
[165]+M[112]*M[157]+M[112]*M[166]+M[113]*M[158]+M[113]*M[167]+M[114]*M[159]+
M[114]*M[168]+M[115]*M[160]+M[115]*M[169]+M[116]*M[161]+M[116]*M[170]+M[117]
```

```
*M[162]+M[117]*M[171]+M[118]*M[163]+M[118]*M[172]+M[119]*M[164]+M[119]*M[173
]+M[120]*M[165]+M[120]*M[174]+M[121]*M[166]+M[121]*M[175]+M[122]*M[167]+M[12
2]*M[176]+M[123]*M[168]+M[123]*M[177]+M[124]*M[169]+M[124]*M[178]+M[125]*M[1
70]+M[125]*M[179]+M[126]*M[171]+M[126]*M[180]+M[127]*M[172]+M[127]*M[181]+M[
128]*M[173]+M[128]*M[182]+M[129]*M[174]+M[129]*M[183]+M[130]*M[175]+M[130]*
M[184]+M[131]*M[176]+M[131]*M[185]+M[132]*M[177]+M[132]*M[186]+M[133]*M[178]
+M[133]*M[187]+M[134]*M[179]+M[134]*M[188]+M[135]*M[180]+M[135]*M[189]+M[13
6]*M[181]+M[136]*M[190]+M[137]*M[182]+M[137]*M[191]+M[138]*M[183]+M[138]*M[1
92]+M[139]*M[184]+M[139]*M[193]+M[140]*M[185]+M[140]*M[194]+M[141]*M[186]+M[
141]*M[195]+M[142]*M[187]+M[142]*M[196]+M[143]*M[188]+M[143]*M[197]+M[144]*
M[189]+M[144]*M[198]+M[145]*M[190]+M[146]*M[191]+M[147]*M[192]+M[148]*M[193]
+M[149]*M[194]+M[150]*M[195]+M[151]*M[196]+M[152]*M[197]+M[153]*M[198]+2);

  of = of +
abs(M[1]*M[45]+M[1]*M[56]+M[2]*M[46]+M[2]*M[57]+M[3]*M[47]+M[3]*M[58]+M[4]*
M[48]+M[4]*M[59]+M[5]*M[49]+M[5]*M[60]+M[6]*M[50]+M[6]*M[61]+M[7]*M[51]+M[7
]*M[62]+M[8]*M[52]+M[8]*M[63]+M[9]*M[53]+M[9]*M[64]+M[10]*M[54]+M[10]*M[65]+
M[11]*M[55]+M[11]*M[66]+M[12]*M[56]+M[12]*M[67]+M[13]*M[57]+M[13]*M[68]+M[1
4]*M[58]+M[14]*M[69]+M[15]*M[59]+M[15]*M[70]+M[16]*M[60]+M[16]*M[71]+M[17]*
M[61]+M[17]*M[72]+M[18]*M[62]+M[18]*M[73]+M[19]*M[63]+M[19]*M[74]+M[20]*M[6
4]+M[20]*M[75]+M[21]*M[65]+M[21]*M[76]+M[22]*M[66]+M[22]*M[77]+M[23]*M[67]+
M[23]*M[78]+M[24]*M[68]+M[24]*M[79]+M[25]*M[69]+M[25]*M[80]+M[26]*M[70]+M[2
6]*M[81]+M[27]*M[71]+M[27]*M[82]+M[28]*M[72]+M[28]*M[83]+M[29]*M[73]+M[29]*
```

```
M[84]+M[30]*M[74]+M[30]*M[85]+M[31]*M[75]+M[31]*M[86]+M[32]*M[76]+M[32]*M[8
7]+M[33]*M[77]+M[33]*M[88]+M[34]*M[78]+M[34]*M[89]+M[35]*M[79]+M[35]*M[90]+
M[36]*M[80]+M[36]*M[91]+M[37]*M[81]+M[37]*M[92]+M[38]*M[82]+M[38]*M[93]+M[3
9]*M[83]+M[39]*M[94]+M[40]*M[84]+M[40]*M[95]+M[41]*M[85]+M[41]*M[96]+M[42]*
M[86]+M[42]*M[97]+M[43]*M[87]+M[43]*M[98]+M[44]*M[88]+M[44]*M[99]+M[45]*M[8
9]+M[46]*M[90]+M[47]*M[91]+M[48]*M[92]+M[49]*M[93]+M[50]*M[94]+M[51]*M[95]+
M[52]*M[96]+M[53]*M[97]+M[54]*M[98]+M[55]*M[99]+M[100]*M[144]+M[100]*M[155]
+M[101]*M[145]+M[101]*M[156]+M[102]*M[146]+M[102]*M[157]+M[103]*M[147]+M[10
3]*M[158]+M[104]*M[148]+M[104]*M[159]+M[105]*M[149]+M[105]*M[160]+M[106]*M[1
50]+M[106]*M[161]+M[107]*M[151]+M[107]*M[162]+M[108]*M[152]+M[108]*M[163]+M[
109]*M[153]+M[109]*M[164]+M[110]*M[154]+M[110]*M[165]+M[111]*M[155]+M[111]*M
[166]+M[112]*M[156]+M[112]*M[167]+M[113]*M[157]+M[113]*M[168]+M[114]*M[158]+
M[114]*M[169]+M[115]*M[159]+M[115]*M[170]+M[116]*M[160]+M[116]*M[171]+M[117]
*M[161]+M[117]*M[172]+M[118]*M[162]+M[118]*M[173]+M[119]*M[163]+M[119]*M[174
]+M[120]*M[164]+M[120]*M[175]+M[121]*M[165]+M[121]*M[176]+M[122]*M[166]+M[12
2]*M[177]+M[123]*M[167]+M[123]*M[178]+M[124]*M[168]+M[124]*M[179]+M[125]*M[1
69]+M[125]*M[180]+M[126]*M[170]+M[126]*M[181]+M[127]*M[171]+M[127]*M[182]+M[
128]*M[172]+M[128]*M[183]+M[129]*M[173]+M[129]*M[184]+M[130]*M[174]+M[130]*
M[185]+M[131]*M[175]+M[131]*M[186]+M[132]*M[176]+M[132]*M[187]+M[133]*M[177]
+M[133]*M[188]+M[134]*M[178]+M[134]*M[189]+M[135]*M[179]+M[135]*M[190]+M[13
6]*M[180]+M[136]*M[191]+M[137]*M[181]+M[137]*M[192]+M[138]*M[182]+M[138]*M[1
93]+M[139]*M[183]+M[139]*M[194]+M[140]*M[184]+M[140]*M[195]+M[141]*M[185]+M[
141]*M[196]+M[142]*M[186]+M[142]*M[197]+M[143]*M[187]+M[143]*M[198]+M[144]*
```

```
M[188]+M[145]*M[189]+M[146]*M[190]+M[147]*M[191]+M[148]*M[192]+M[149]*M[193]
+M[150]*M[194]+M[151]*M[195]+M[152]*M[196]+M[153]*M[197]+M[154]*M[198]+2);

  of = of +
abs(M[1]*M[44]+M[1]*M[57]+M[2]*M[45]+M[2]*M[58]+M[3]*M[46]+M[3]*M[59]+M[4]*
M[47]+M[4]*M[60]+M[5]*M[48]+M[5]*M[61]+M[6]*M[49]+M[6]*M[62]+M[7]*M[50]+M[7
]*M[63]+M[8]*M[51]+M[8]*M[64]+M[9]*M[52]+M[9]*M[65]+M[10]*M[53]+M[10]*M[66]+
M[11]*M[54]+M[11]*M[67]+M[12]*M[55]+M[12]*M[68]+M[13]*M[56]+M[13]*M[69]+M[1
4]*M[57]+M[14]*M[70]+M[15]*M[58]+M[15]*M[71]+M[16]*M[59]+M[16]*M[72]+M[17]*
M[60]+M[17]*M[73]+M[18]*M[61]+M[18]*M[74]+M[19]*M[62]+M[19]*M[75]+M[20]*M[6
3]+M[20]*M[76]+M[21]*M[64]+M[21]*M[77]+M[22]*M[65]+M[22]*M[78]+M[23]*M[66]+
M[23]*M[79]+M[24]*M[67]+M[24]*M[80]+M[25]*M[68]+M[25]*M[81]+M[26]*M[69]+M[2
6]*M[82]+M[27]*M[70]+M[27]*M[83]+M[28]*M[71]+M[28]*M[84]+M[29]*M[72]+M[29]*
M[85]+M[30]*M[73]+M[30]*M[86]+M[31]*M[74]+M[31]*M[87]+M[32]*M[75]+M[32]*M[8
8]+M[33]*M[76]+M[33]*M[89]+M[34]*M[77]+M[34]*M[90]+M[35]*M[78]+M[35]*M[91]+
M[36]*M[79]+M[36]*M[92]+M[37]*M[80]+M[37]*M[93]+M[38]*M[81]+M[38]*M[94]+M[3
9]*M[82]+M[39]*M[95]+M[40]*M[83]+M[40]*M[96]+M[41]*M[84]+M[41]*M[97]+M[42]*
M[85]+M[42]*M[98]+M[43]*M[86]+M[43]*M[99]+M[44]*M[87]+M[45]*M[88]+M[46]*M[8
9]+M[47]*M[90]+M[48]*M[91]+M[49]*M[92]+M[50]*M[93]+M[51]*M[94]+M[52]*M[95]+
M[53]*M[96]+M[54]*M[97]+M[55]*M[98]+M[56]*M[99]+M[100]*M[143]+M[100]*M[156]
+M[101]*M[144]+M[101]*M[157]+M[102]*M[145]+M[102]*M[158]+M[103]*M[146]+M[10
3]*M[159]+M[104]*M[147]+M[104]*M[160]+M[105]*M[148]+M[105]*M[161]+M[106]*M[1
49]+M[106]*M[162]+M[107]*M[150]+M[107]*M[163]+M[108]*M[151]+M[108]*M[164]+M[
109]*M[152]+M[109]*M[165]+M[110]*M[153]+M[110]*M[166]+M[111]*M[154]+M[111]*M
[167]+M[112]*M[155]+M[112]*M[168]+M[113]*M[156]+M[113]*M[169]+M[114]*M[157]+
M[114]*M[170]+M[115]*M[158]+M[115]*M[171]+M[116]*M[159]+M[116]*M[172]+M[117]
*M[160]+M[117]*M[173]+M[118]*M[161]+M[118]*M[174]+M[119]*M[162]+M[119]*M[175
]+M[120]*M[163]+M[120]*M[176]+M[121]*M[164]+M[121]*M[177]+M[122]*M[165]+M[12
2]*M[178]+M[123]*M[166]+M[123]*M[179]+M[124]*M[167]+M[124]*M[180]+M[125]*M[1
68]+M[125]*M[181]+M[126]*M[169]+M[126]*M[182]+M[127]*M[170]+M[127]*M[183]+M[
128]*M[171]+M[128]*M[184]+M[129]*M[172]+M[129]*M[185]+M[130]*M[173]+M[130]*
M[186]+M[131]*M[174]+M[131]*M[187]+M[132]*M[175]+M[132]*M[188]+M[133]*M[176]
+M[133]*M[189]+M[134]*M[177]+M[134]*M[190]+M[135]*M[178]+M[135]*M[191]+M[13
6]*M[179]+M[136]*M[192]+M[137]*M[180]+M[137]*M[193]+M[138]*M[181]+M[138]*M[1
94]+M[139]*M[182]+M[139]*M[195]+M[140]*M[183]+M[140]*M[196]+M[141]*M[184]+M[
141]*M[197]+M[142]*M[185]+M[142]*M[198]+M[143]*M[186]+M[144]*M[187]+M[145]*
M[188]+M[146]*M[189]+M[147]*M[190]+M[148]*M[191]+M[149]*M[192]+M[150]*M[193]
+M[151]*M[194]+M[152]*M[195]+M[153]*M[196]+M[154]*M[197]+M[155]*M[198]+2);

  of = of +
abs(M[1]*M[43]+M[1]*M[58]+M[2]*M[44]+M[2]*M[59]+M[3]*M[45]+M[3]*M[60]+M[4]*
M[46]+M[4]*M[61]+M[5]*M[47]+M[5]*M[62]+M[6]*M[48]+M[6]*M[63]+M[7]*M[49]+M[7
]*M[64]+M[8]*M[50]+M[8]*M[65]+M[9]*M[51]+M[9]*M[66]+M[10]*M[52]+M[10]*M[67]+
M[11]*M[53]+M[11]*M[68]+M[12]*M[54]+M[12]*M[69]+M[13]*M[55]+M[13]*M[70]+M[1
4]*M[56]+M[14]*M[71]+M[15]*M[57]+M[15]*M[72]+M[16]*M[58]+M[16]*M[73]+M[17]*
M[59]+M[17]*M[74]+M[18]*M[60]+M[18]*M[75]+M[19]*M[61]+M[19]*M[76]+M[20]*M[6
```

2]+M[20]*M[77]+M[21]*M[63]+M[21]*M[78]+M[22]*M[64]+M[22]*M[79]+M[23]*M[65]+
M[23]*M[80]+M[24]*M[66]+M[24]*M[81]+M[25]*M[67]+M[25]*M[82]+M[26]*M[68]+M[2
6]*M[83]+M[27]*M[69]+M[27]*M[84]+M[28]*M[70]+M[28]*M[85]+M[29]*M[71]+M[29]*
M[86]+M[30]*M[72]+M[30]*M[87]+M[31]*M[73]+M[31]*M[88]+M[32]*M[74]+M[32]*M[8
9]+M[33]*M[75]+M[33]*M[90]+M[34]*M[76]+M[34]*M[91]+M[35]*M[77]+M[35]*M[92]+
M[36]*M[78]+M[36]*M[93]+M[37]*M[79]+M[37]*M[94]+M[38]*M[80]+M[38]*M[95]+M[3
9]*M[81]+M[39]*M[96]+M[40]*M[82]+M[40]*M[97]+M[41]*M[83]+M[41]*M[98]+M[42]*
M[84]+M[42]*M[99]+M[43]*M[85]+M[44]*M[86]+M[45]*M[87]+M[46]*M[88]+M[47]*M[8
9]+M[48]*M[90]+M[49]*M[91]+M[50]*M[92]+M[51]*M[93]+M[52]*M[94]+M[53]*M[95]+
M[54]*M[96]+M[55]*M[97]+M[56]*M[98]+M[57]*M[99]+M[100]*M[142]+M[100]*M[157]
+M[101]*M[143]+M[101]*M[158]+M[102]*M[144]+M[102]*M[159]+M[103]*M[145]+M[10
3]*M[160]+M[104]*M[146]+M[104]*M[161]+M[105]*M[147]+M[105]*M[162]+M[106]*M[1
48]+M[106]*M[163]+M[107]*M[149]+M[107]*M[164]+M[108]*M[150]+M[108]*M[165]+M[
109]*M[151]+M[109]*M[166]+M[110]*M[152]+M[110]*M[167]+M[111]*M[153]+M[111]*M
[168]+M[112]*M[154]+M[112]*M[169]+M[113]*M[155]+M[113]*M[170]+M[114]*M[156]+
M[114]*M[171]+M[115]*M[157]+M[115]*M[172]+M[116]*M[158]+M[116]*M[173]+M[117]
*M[159]+M[117]*M[174]+M[118]*M[160]+M[118]*M[175]+M[119]*M[161]+M[119]*M[176
]+M[120]*M[162]+M[120]*M[177]+M[121]*M[163]+M[121]*M[178]+M[122]*M[164]+M[12
2]*M[179]+M[123]*M[165]+M[123]*M[180]+M[124]*M[166]+M[124]*M[181]+M[125]*M[1
67]+M[125]*M[182]+M[126]*M[168]+M[126]*M[183]+M[127]*M[169]+M[127]*M[184]+M[
128]*M[170]+M[128]*M[185]+M[129]*M[171]+M[129]*M[186]+M[130]*M[172]+M[130]*
M[187]+M[131]*M[173]+M[131]*M[188]+M[132]*M[174]+M[132]*M[189]+M[133]*M[175]
+M[133]*M[190]+M[134]*M[176]+M[134]*M[191]+M[135]*M[177]+M[135]*M[192]+M[13

6]*M[178]+M[136]*M[193]+M[137]*M[179]+M[137]*M[194]+M[138]*M[180]+M[138]*M[1
95]+M[139]*M[181]+M[139]*M[196]+M[140]*M[182]+M[140]*M[197]+M[141]*M[183]+M[
141]*M[198]+M[142]*M[184]+M[143]*M[185]+M[144]*M[186]+M[145]*M[187]+M[146]*
M[188]+M[147]*M[189]+M[148]*M[190]+M[149]*M[191]+M[150]*M[192]+M[151]*M[193]
+M[152]*M[194]+M[153]*M[195]+M[154]*M[196]+M[155]*M[197]+M[156]*M[198]+2);

of = of +
abs(M[1]*M[49]+M[1]*M[52]+M[2]*M[50]+M[2]*M[53]+M[3]*M[51]+M[3]*M[54]+M[4]*
M[52]+M[4]*M[55]+M[5]*M[53]+M[5]*M[56]+M[6]*M[54]+M[6]*M[57]+M[7]*M[55]+M[7
]*M[58]+M[8]*M[56]+M[8]*M[59]+M[9]*M[57]+M[9]*M[60]+M[10]*M[58]+M[10]*M[61]+
M[11]*M[59]+M[11]*M[62]+M[12]*M[60]+M[12]*M[63]+M[13]*M[61]+M[13]*M[64]+M[1
4]*M[62]+M[14]*M[65]+M[15]*M[63]+M[15]*M[66]+M[16]*M[64]+M[16]*M[67]+M[17]*
M[65]+M[17]*M[68]+M[18]*M[66]+M[18]*M[69]+M[19]*M[67]+M[19]*M[70]+M[20]*M[6
8]+M[20]*M[71]+M[21]*M[69]+M[21]*M[72]+M[22]*M[70]+M[22]*M[73]+M[23]*M[71]+
M[23]*M[74]+M[24]*M[72]+M[24]*M[75]+M[25]*M[73]+M[25]*M[76]+M[26]*M[74]+M[2
6]*M[77]+M[27]*M[75]+M[27]*M[78]+M[28]*M[76]+M[28]*M[79]+M[29]*M[77]+M[29]*
M[80]+M[30]*M[78]+M[30]*M[81]+M[31]*M[79]+M[31]*M[82]+M[32]*M[80]+M[32]*M[8
3]+M[33]*M[81]+M[33]*M[84]+M[34]*M[82]+M[34]*M[85]+M[35]*M[83]+M[35]*M[86]+
M[36]*M[84]+M[36]*M[87]+M[37]*M[85]+M[37]*M[88]+M[38]*M[86]+M[38]*M[89]+M[3
9]*M[87]+M[39]*M[90]+M[40]*M[88]+M[40]*M[91]+M[41]*M[89]+M[41]*M[92]+M[42]*
M[90]+M[42]*M[93]+M[43]*M[91]+M[43]*M[94]+M[44]*M[92]+M[44]*M[95]+M[45]*M[9
3]+M[45]*M[96]+M[46]*M[94]+M[46]*M[97]+M[47]*M[95]+M[47]*M[98]+M[48]*M[96]+
M[48]*M[99]+M[49]*M[97]+M[50]*M[98]+M[51]*M[99]+M[100]*M[148]+M[100]*M[151]

```
+M[101]*M[149]+M[101]*M[152]+M[102]*M[150]+M[102]*M[153]+M[103]*M[151]+M[10
3]*M[154]+M[104]*M[152]+M[104]*M[155]+M[105]*M[153]+M[105]*M[156]+M[106]*M[1
54]+M[106]*M[157]+M[107]*M[155]+M[107]*M[158]+M[108]*M[156]+M[108]*M[159]+M[
109]*M[157]+M[109]*M[160]+M[110]*M[158]+M[110]*M[161]+M[111]*M[159]+M[111]*M
[162]+M[112]*M[160]+M[112]*M[163]+M[113]*M[161]+M[113]*M[164]+M[114]*M[162]+
M[114]*M[165]+M[115]*M[163]+M[115]*M[166]+M[116]*M[164]+M[116]*M[167]+M[117]
*M[165]+M[117]*M[168]+M[118]*M[166]+M[118]*M[169]+M[119]*M[167]+M[119]*M[170
]+M[120]*M[168]+M[120]*M[171]+M[121]*M[169]+M[121]*M[172]+M[122]*M[170]+M[12
2]*M[173]+M[123]*M[171]+M[123]*M[174]+M[124]*M[172]+M[124]*M[175]+M[125]*M[1
73]+M[125]*M[176]+M[126]*M[174]+M[126]*M[177]+M[127]*M[175]+M[127]*M[178]+M[
128]*M[176]+M[128]*M[179]+M[129]*M[177]+M[129]*M[180]+M[130]*M[178]+M[130]*
M[181]+M[131]*M[179]+M[131]*M[182]+M[132]*M[180]+M[132]*M[183]+M[133]*M[181]
+M[133]*M[184]+M[134]*M[182]+M[134]*M[185]+M[135]*M[183]+M[135]*M[186]+M[13
6]*M[184]+M[136]*M[187]+M[137]*M[185]+M[137]*M[188]+M[138]*M[186]+M[138]*M[1
89]+M[139]*M[187]+M[139]*M[190]+M[140]*M[188]+M[140]*M[191]+M[141]*M[189]+M[
141]*M[192]+M[142]*M[190]+M[142]*M[193]+M[143]*M[191]+M[143]*M[194]+M[144]*
M[192]+M[144]*M[195]+M[145]*M[193]+M[145]*M[196]+M[146]*M[194]+M[146]*M[197]
+M[147]*M[195]+M[147]*M[198]+M[148]*M[196]+M[149]*M[197]+M[150]*M[198]+2);

  of = of +
abs(M[1]*M[48]+M[1]*M[53]+M[2]*M[49]+M[2]*M[54]+M[3]*M[50]+M[3]*M[55]+M[4]*
M[51]+M[4]*M[56]+M[5]*M[52]+M[5]*M[57]+M[6]*M[53]+M[6]*M[58]+M[7]*M[54]+M[7
]*M[59]+M[8]*M[55]+M[8]*M[60]+M[9]*M[56]+M[9]*M[61]+M[10]*M[57]+M[10]*M[62]+
```

M[11]*M[58]+M[11]*M[63]+M[12]*M[59]+M[12]*M[64]+M[13]*M[60]+M[13]*M[65]+M[1
4]*M[61]+M[14]*M[66]+M[15]*M[62]+M[15]*M[67]+M[16]*M[63]+M[16]*M[68]+M[17]*
M[64]+M[17]*M[69]+M[18]*M[65]+M[18]*M[70]+M[19]*M[66]+M[19]*M[71]+M[20]*M[6
7]+M[20]*M[72]+M[21]*M[68]+M[21]*M[73]+M[22]*M[69]+M[22]*M[74]+M[23]*M[70]+
M[23]*M[75]+M[24]*M[71]+M[24]*M[76]+M[25]*M[72]+M[25]*M[77]+M[26]*M[73]+M[2
6]*M[78]+M[27]*M[74]+M[27]*M[79]+M[28]*M[75]+M[28]*M[80]+M[29]*M[76]+M[29]*
M[81]+M[30]*M[77]+M[30]*M[82]+M[31]*M[78]+M[31]*M[83]+M[32]*M[79]+M[32]*M[8
4]+M[33]*M[80]+M[33]*M[85]+M[34]*M[81]+M[34]*M[86]+M[35]*M[82]+M[35]*M[87]+
M[36]*M[83]+M[36]*M[88]+M[37]*M[84]+M[37]*M[89]+M[38]*M[85]+M[38]*M[90]+M[3
9]*M[86]+M[39]*M[91]+M[40]*M[87]+M[40]*M[92]+M[41]*M[88]+M[41]*M[93]+M[42]*
M[89]+M[42]*M[94]+M[43]*M[90]+M[43]*M[95]+M[44]*M[91]+M[44]*M[96]+M[45]*M[9
2]+M[45]*M[97]+M[46]*M[93]+M[46]*M[98]+M[47]*M[94]+M[47]*M[99]+M[48]*M[95]+
M[49]*M[96]+M[50]*M[97]+M[51]*M[98]+M[52]*M[99]+M[100]*M[147]+M[100]*M[152]
+M[101]*M[148]+M[101]*M[153]+M[102]*M[149]+M[102]*M[154]+M[103]*M[150]+M[10
3]*M[155]+M[104]*M[151]+M[104]*M[156]+M[105]*M[152]+M[105]*M[157]+M[106]*M[1
53]+M[106]*M[158]+M[107]*M[154]+M[107]*M[159]+M[108]*M[155]+M[108]*M[160]+M[
109]*M[156]+M[109]*M[161]+M[110]*M[157]+M[110]*M[162]+M[111]*M[158]+M[111]*M
[163]+M[112]*M[159]+M[112]*M[164]+M[113]*M[160]+M[113]*M[165]+M[114]*M[161]+
M[114]*M[166]+M[115]*M[162]+M[115]*M[167]+M[116]*M[163]+M[116]*M[168]+M[117]
*M[164]+M[117]*M[169]+M[118]*M[165]+M[118]*M[170]+M[119]*M[166]+M[119]*M[171
]+M[120]*M[167]+M[120]*M[172]+M[121]*M[168]+M[121]*M[173]+M[122]*M[169]+M[12
2]*M[174]+M[123]*M[170]+M[123]*M[175]+M[124]*M[171]+M[124]*M[176]+M[125]*M[1
72]+M[125]*M[177]+M[126]*M[173]+M[126]*M[178]+M[127]*M[174]+M[127]*M[179]+M[

128]*M[175]+M[128]*M[180]+M[129]*M[176]+M[129]*M[181]+M[130]*M[177]+M[130]*
M[182]+M[131]*M[178]+M[131]*M[183]+M[132]*M[179]+M[132]*M[184]+M[133]*M[180]
+M[133]*M[185]+M[134]*M[181]+M[134]*M[186]+M[135]*M[182]+M[135]*M[187]+M[13
6]*M[183]+M[136]*M[188]+M[137]*M[184]+M[137]*M[189]+M[138]*M[185]+M[138]*M[1
90]+M[139]*M[186]+M[139]*M[191]+M[140]*M[187]+M[140]*M[192]+M[141]*M[188]+M[
141]*M[193]+M[142]*M[189]+M[142]*M[194]+M[143]*M[190]+M[143]*M[195]+M[144]*
M[191]+M[144]*M[196]+M[145]*M[192]+M[145]*M[197]+M[146]*M[193]+M[146]*M[198]
+M[147]*M[194]+M[148]*M[195]+M[149]*M[196]+M[150]*M[197]+M[151]*M[198]+2);

of = of +
abs(M[1]*M[47]+M[1]*M[54]+M[2]*M[48]+M[2]*M[55]+M[3]*M[49]+M[3]*M[56]+M[4]*
M[50]+M[4]*M[57]+M[5]*M[51]+M[5]*M[58]+M[6]*M[52]+M[6]*M[59]+M[7]*M[53]+M[7
]*M[60]+M[8]*M[54]+M[8]*M[61]+M[9]*M[55]+M[9]*M[62]+M[10]*M[56]+M[10]*M[63]+
M[11]*M[57]+M[11]*M[64]+M[12]*M[58]+M[12]*M[65]+M[13]*M[59]+M[13]*M[66]+M[1
4]*M[60]+M[14]*M[67]+M[15]*M[61]+M[15]*M[68]+M[16]*M[62]+M[16]*M[69]+M[17]*
M[63]+M[17]*M[70]+M[18]*M[64]+M[18]*M[71]+M[19]*M[65]+M[19]*M[72]+M[20]*M[6
6]+M[20]*M[73]+M[21]*M[67]+M[21]*M[74]+M[22]*M[68]+M[22]*M[75]+M[23]*M[69]+
M[23]*M[76]+M[24]*M[70]+M[24]*M[77]+M[25]*M[71]+M[25]*M[78]+M[26]*M[72]+M[2
6]*M[79]+M[27]*M[73]+M[27]*M[80]+M[28]*M[74]+M[28]*M[81]+M[29]*M[75]+M[29]*
M[82]+M[30]*M[76]+M[30]*M[83]+M[31]*M[77]+M[31]*M[84]+M[32]*M[78]+M[32]*M[8
5]+M[33]*M[79]+M[33]*M[86]+M[34]*M[80]+M[34]*M[87]+M[35]*M[81]+M[35]*M[88]+
M[36]*M[82]+M[36]*M[89]+M[37]*M[83]+M[37]*M[90]+M[38]*M[84]+M[38]*M[91]+M[3
9]*M[85]+M[39]*M[92]+M[40]*M[86]+M[40]*M[93]+M[41]*M[87]+M[41]*M[94]+M[42]*

```
M[88]+M[42]*M[95]+M[43]*M[89]+M[43]*M[96]+M[44]*M[90]+M[44]*M[97]+M[45]*M[9
1]+M[45]*M[98]+M[46]*M[92]+M[46]*M[99]+M[47]*M[93]+M[48]*M[94]+M[49]*M[95]+
M[50]*M[96]+M[51]*M[97]+M[52]*M[98]+M[53]*M[99]+M[100]*M[146]+M[100]*M[153]
+M[101]*M[147]+M[101]*M[154]+M[102]*M[148]+M[102]*M[155]+M[103]*M[149]+M[10
3]*M[156]+M[104]*M[150]+M[104]*M[157]+M[105]*M[151]+M[105]*M[158]+M[106]*M[1
52]+M[106]*M[159]+M[107]*M[153]+M[107]*M[160]+M[108]*M[154]+M[108]*M[161]+M[
109]*M[155]+M[109]*M[162]+M[110]*M[156]+M[110]*M[163]+M[111]*M[157]+M[111]*M
[164]+M[112]*M[158]+M[112]*M[165]+M[113]*M[159]+M[113]*M[166]+M[114]*M[160]+
M[114]*M[167]+M[115]*M[161]+M[115]*M[168]+M[116]*M[162]+M[116]*M[169]+M[117]
*M[163]+M[117]*M[170]+M[118]*M[164]+M[118]*M[171]+M[119]*M[165]+M[119]*M[172
]+M[120]*M[166]+M[120]*M[173]+M[121]*M[167]+M[121]*M[174]+M[122]*M[168]+M[12
2]*M[175]+M[123]*M[169]+M[123]*M[176]+M[124]*M[170]+M[124]*M[177]+M[125]*M[1
71]+M[125]*M[178]+M[126]*M[172]+M[126]*M[179]+M[127]*M[173]+M[127]*M[180]+M[
128]*M[174]+M[128]*M[181]+M[129]*M[175]+M[129]*M[182]+M[130]*M[176]+M[130]*
M[183]+M[131]*M[177]+M[131]*M[184]+M[132]*M[178]+M[132]*M[185]+M[133]*M[179]
+M[133]*M[186]+M[134]*M[180]+M[134]*M[187]+M[135]*M[181]+M[135]*M[188]+M[13
6]*M[182]+M[136]*M[189]+M[137]*M[183]+M[137]*M[190]+M[138]*M[184]+M[138]*M[1
91]+M[139]*M[185]+M[139]*M[192]+M[140]*M[186]+M[140]*M[193]+M[141]*M[187]+M[
141]*M[194]+M[142]*M[188]+M[142]*M[195]+M[143]*M[189]+M[143]*M[196]+M[144]*
M[190]+M[144]*M[197]+M[145]*M[191]+M[145]*M[198]+M[146]*M[192]+M[147]*M[193]
+M[148]*M[194]+M[149]*M[195]+M[150]*M[196]+M[151]*M[197]+M[152]*M[198]+2);
```

```
    of = of +
abs(M[1]*M[50]+M[1]*M[51]+M[2]*M[51]+M[2]*M[52]+M[3]*M[52]+M[3]*M[53]+M[4]*
M[53]+M[4]*M[54]+M[5]*M[54]+M[5]*M[55]+M[6]*M[55]+M[6]*M[56]+M[7]*M[56]+M[7
]*M[57]+M[8]*M[57]+M[8]*M[58]+M[9]*M[58]+M[9]*M[59]+M[10]*M[59]+M[10]*M[60]+
M[11]*M[60]+M[11]*M[61]+M[12]*M[61]+M[12]*M[62]+M[13]*M[62]+M[13]*M[63]+M[1
4]*M[63]+M[14]*M[64]+M[15]*M[64]+M[15]*M[65]+M[16]*M[65]+M[16]*M[66]+M[17]*
M[66]+M[17]*M[67]+M[18]*M[67]+M[18]*M[68]+M[19]*M[68]+M[19]*M[69]+M[20]*M[6
9]+M[20]*M[70]+M[21]*M[70]+M[21]*M[71]+M[22]*M[71]+M[22]*M[72]+M[23]*M[72]+
M[23]*M[73]+M[24]*M[73]+M[24]*M[74]+M[25]*M[74]+M[25]*M[75]+M[26]*M[75]+M[2
6]*M[76]+M[27]*M[76]+M[27]*M[77]+M[28]*M[77]+M[28]*M[78]+M[29]*M[78]+M[29]*
M[79]+M[30]*M[79]+M[30]*M[80]+M[31]*M[80]+M[31]*M[81]+M[32]*M[81]+M[32]*M[8
2]+M[33]*M[82]+M[33]*M[83]+M[34]*M[83]+M[34]*M[84]+M[35]*M[84]+M[35]*M[85]+
M[36]*M[85]+M[36]*M[86]+M[37]*M[86]+M[37]*M[87]+M[38]*M[87]+M[38]*M[88]+M[3
9]*M[88]+M[39]*M[89]+M[40]*M[89]+M[40]*M[90]+M[41]*M[90]+M[41]*M[91]+M[42]*
M[91]+M[42]*M[92]+M[43]*M[92]+M[43]*M[93]+M[44]*M[93]+M[44]*M[94]+M[45]*M[9
4]+M[45]*M[95]+M[46]*M[95]+M[46]*M[96]+M[47]*M[96]+M[47]*M[97]+M[48]*M[97]+
M[48]*M[98]+M[49]*M[98]+M[49]*M[99]+M[50]*M[99]+M[100]*M[149]+M[100]*M[150]
+M[101]*M[150]+M[101]*M[151]+M[102]*M[151]+M[102]*M[152]+M[103]*M[152]+M[10
3]*M[153]+M[104]*M[153]+M[104]*M[154]+M[105]*M[154]+M[105]*M[155]+M[106]*M[1
55]+M[106]*M[156]+M[107]*M[156]+M[107]*M[157]+M[108]*M[157]+M[108]*M[158]+M[
109]*M[158]+M[109]*M[159]+M[110]*M[159]+M[110]*M[160]+M[111]*M[160]+M[111]*M
[161]+M[112]*M[161]+M[112]*M[162]+M[113]*M[162]+M[113]*M[163]+M[114]*M[163]+
M[114]*M[164]+M[115]*M[164]+M[115]*M[165]+M[116]*M[165]+M[116]*M[166]+M[117]
```

```
*M[166]+M[117]*M[167]+M[118]*M[167]+M[118]*M[168]+M[119]*M[168]+M[119]*M[169
]+M[120]*M[169]+M[120]*M[170]+M[121]*M[170]+M[121]*M[171]+M[122]*M[171]+M[12
2]*M[172]+M[123]*M[172]+M[123]*M[173]+M[124]*M[173]+M[124]*M[174]+M[125]*M[1
74]+M[125]*M[175]+M[126]*M[175]+M[126]*M[176]+M[127]*M[176]+M[127]*M[177]+M[
128]*M[177]+M[128]*M[178]+M[129]*M[178]+M[129]*M[179]+M[130]*M[179]+M[130]*
M[180]+M[131]*M[180]+M[131]*M[181]+M[132]*M[181]+M[132]*M[182]+M[133]*M[182]
+M[133]*M[183]+M[134]*M[183]+M[134]*M[184]+M[135]*M[184]+M[135]*M[185]+M[13
6]*M[185]+M[136]*M[186]+M[137]*M[186]+M[137]*M[187]+M[138]*M[187]+M[138]*M[1
88]+M[139]*M[188]+M[139]*M[189]+M[140]*M[189]+M[140]*M[190]+M[141]*M[190]+M[
141]*M[191]+M[142]*M[191]+M[142]*M[192]+M[143]*M[192]+M[143]*M[193]+M[144]*
M[193]+M[144]*M[194]+M[145]*M[194]+M[145]*M[195]+M[146]*M[195]+M[146]*M[196]
+M[147]*M[196]+M[147]*M[197]+M[148]*M[197]+M[148]*M[198]+M[149]*M[198]+2);

   of = of +
abs(M[1]*M[2]+M[1]*M[99]+M[2]*M[3]+M[3]*M[4]+M[4]*M[5]+M[5]*M[6]+M[6]*M[7]+
M[7]*M[8]+M[8]*M[9]+M[9]*M[10]+M[10]*M[11]+M[11]*M[12]+M[12]*M[13]+M[13]*M[
14]+M[14]*M[15]+M[15]*M[16]+M[16]*M[17]+M[17]*M[18]+M[18]*M[19]+M[19]*M[20]+
M[20]*M[21]+M[21]*M[22]+M[22]*M[23]+M[23]*M[24]+M[24]*M[25]+M[25]*M[26]+M[2
6]*M[27]+M[27]*M[28]+M[28]*M[29]+M[29]*M[30]+M[30]*M[31]+M[31]*M[32]+M[32]*
M[33]+M[33]*M[34]+M[34]*M[35]+M[35]*M[36]+M[36]*M[37]+M[37]*M[38]+M[38]*M[3
9]+M[39]*M[40]+M[40]*M[41]+M[41]*M[42]+M[42]*M[43]+M[43]*M[44]+M[44]*M[45]+
M[45]*M[46]+M[46]*M[47]+M[47]*M[48]+M[48]*M[49]+M[49]*M[50]+M[50]*M[51]+M[5
1]*M[52]+M[52]*M[53]+M[53]*M[54]+M[54]*M[55]+M[55]*M[56]+M[56]*M[57]+M[57]*
```

M[58]+M[58]*M[59]+M[59]*M[60]+M[60]*M[61]+M[61]*M[62]+M[62]*M[63]+M[63]*M[6
4]+M[64]*M[65]+M[65]*M[66]+M[66]*M[67]+M[67]*M[68]+M[68]*M[69]+M[69]*M[70]+
M[70]*M[71]+M[71]*M[72]+M[72]*M[73]+M[73]*M[74]+M[74]*M[75]+M[75]*M[76]+M[7
6]*M[77]+M[77]*M[78]+M[78]*M[79]+M[79]*M[80]+M[80]*M[81]+M[81]*M[82]+M[82]*
M[83]+M[83]*M[84]+M[84]*M[85]+M[85]*M[86]+M[86]*M[87]+M[87]*M[88]+M[88]*M[8
9]+M[89]*M[90]+M[90]*M[91]+M[91]*M[92]+M[92]*M[93]+M[93]*M[94]+M[94]*M[95]+
M[95]*M[96]+M[96]*M[97]+M[97]*M[98]+M[98]*M[99]+M[100]*M[101]+M[100]*M[198]
+M[101]*M[102]+M[102]*M[103]+M[103]*M[104]+M[104]*M[105]+M[105]*M[106]+M[10
6]*M[107]+M[107]*M[108]+M[108]*M[109]+M[109]*M[110]+M[110]*M[111]+M[111]*M[1
12]+M[112]*M[113]+M[113]*M[114]+M[114]*M[115]+M[115]*M[116]+M[116]*M[117]+M[
117]*M[118]+M[118]*M[119]+M[119]*M[120]+M[120]*M[121]+M[121]*M[122]+M[122]*M
[123]+M[123]*M[124]+M[124]*M[125]+M[125]*M[126]+M[126]*M[127]+M[127]*M[128]+
M[128]*M[129]+M[129]*M[130]+M[130]*M[131]+M[131]*M[132]+M[132]*M[133]+M[133]
*M[134]+M[134]*M[135]+M[135]*M[136]+M[136]*M[137]+M[137]*M[138]+M[138]*M[13
9]+M[139]*M[140]+M[140]*M[141]+M[141]*M[142]+M[142]*M[143]+M[143]*M[144]+M[1
44]*M[145]+M[145]*M[146]+M[146]*M[147]+M[147]*M[148]+M[148]*M[149]+M[149]*M[
150]+M[150]*M[151]+M[151]*M[152]+M[152]*M[153]+M[153]*M[154]+M[154]*M[155]+
M[155]*M[156]+M[156]*M[157]+M[157]*M[158]+M[158]*M[159]+M[159]*M[160]+M[160]
*M[161]+M[161]*M[162]+M[162]*M[163]+M[163]*M[164]+M[164]*M[165]+M[165]*M[16
6]+M[166]*M[167]+M[167]*M[168]+M[168]*M[169]+M[169]*M[170]+M[170]*M[171]+M[1
71]*M[172]+M[172]*M[173]+M[173]*M[174]+M[174]*M[175]+M[175]*M[176]+M[176]*M[
177]+M[177]*M[178]+M[178]*M[179]+M[179]*M[180]+M[180]*M[181]+M[181]*M[182]+
M[182]*M[183]+M[183]*M[184]+M[184]*M[185]+M[185]*M[186]+M[186]*M[187]+M[187]

```
*M[188]+M[188]*M[189]+M[189]*M[190]+M[190]*M[191]+M[191]*M[192]+M[192]*M[19
3]+M[193]*M[194]+M[194]*M[195]+M[195]*M[196]+M[196]*M[197]+M[197]*M[198]+2);

   of = of +
abs(M[1]*M[3]+M[1]*M[98]+M[2]*M[4]+M[2]*M[99]+M[3]*M[5]+M[4]*M[6]+M[5]*M[7]+
M[6]*M[8]+M[7]*M[9]+M[8]*M[10]+M[9]*M[11]+M[10]*M[12]+M[11]*M[13]+M[12]*M[1
4]+M[13]*M[15]+M[14]*M[16]+M[15]*M[17]+M[16]*M[18]+M[17]*M[19]+M[18]*M[20]+
M[19]*M[21]+M[20]*M[22]+M[21]*M[23]+M[22]*M[24]+M[23]*M[25]+M[24]*M[26]+M[2
5]*M[27]+M[26]*M[28]+M[27]*M[29]+M[28]*M[30]+M[29]*M[31]+M[30]*M[32]+M[31]*
M[33]+M[32]*M[34]+M[33]*M[35]+M[34]*M[36]+M[35]*M[37]+M[36]*M[38]+M[37]*M[3
9]+M[38]*M[40]+M[39]*M[41]+M[40]*M[42]+M[41]*M[43]+M[42]*M[44]+M[43]*M[45]+
M[44]*M[46]+M[45]*M[47]+M[46]*M[48]+M[47]*M[49]+M[48]*M[50]+M[49]*M[51]+M[5
0]*M[52]+M[51]*M[53]+M[52]*M[54]+M[53]*M[55]+M[54]*M[56]+M[55]*M[57]+M[56]*
M[58]+M[57]*M[59]+M[58]*M[60]+M[59]*M[61]+M[60]*M[62]+M[61]*M[63]+M[62]*M[6
4]+M[63]*M[65]+M[64]*M[66]+M[65]*M[67]+M[66]*M[68]+M[67]*M[69]+M[68]*M[70]+
M[69]*M[71]+M[70]*M[72]+M[71]*M[73]+M[72]*M[74]+M[73]*M[75]+M[74]*M[76]+M[7
5]*M[77]+M[76]*M[78]+M[77]*M[79]+M[78]*M[80]+M[79]*M[81]+M[80]*M[82]+M[81]*
M[83]+M[82]*M[84]+M[83]*M[85]+M[84]*M[86]+M[85]*M[87]+M[86]*M[88]+M[87]*M[8
9]+M[88]*M[90]+M[89]*M[91]+M[90]*M[92]+M[91]*M[93]+M[92]*M[94]+M[93]*M[95]+
M[94]*M[96]+M[95]*M[97]+M[96]*M[98]+M[97]*M[99]+M[100]*M[102]+M[100]*M[197]
+M[101]*M[103]+M[101]*M[198]+M[102]*M[104]+M[103]*M[105]+M[104]*M[106]+M[10
5]*M[107]+M[106]*M[108]+M[107]*M[109]+M[108]*M[110]+M[109]*M[111]+M[110]*M[1
12]+M[111]*M[113]+M[112]*M[114]+M[113]*M[115]+M[114]*M[116]+M[115]*M[117]+M[
116]*M[118]+M[117]*M[119]+M[118]*M[120]+M[119]*M[121]+M[120]*M[122]+M[121]*M
[123]+M[122]*M[124]+M[123]*M[125]+M[124]*M[126]+M[125]*M[127]+M[126]*M[128]+
M[127]*M[129]+M[128]*M[130]+M[129]*M[131]+M[130]*M[132]+M[131]*M[133]+M[132]
*M[134]+M[133]*M[135]+M[134]*M[136]+M[135]*M[137]+M[136]*M[138]+M[137]*M[13
9]+M[138]*M[140]+M[139]*M[141]+M[140]*M[142]+M[141]*M[143]+M[142]*M[144]+M[1
43]*M[145]+M[144]*M[146]+M[145]*M[147]+M[146]*M[148]+M[147]*M[149]+M[148]*M[
150]+M[149]*M[151]+M[150]*M[152]+M[151]*M[153]+M[152]*M[154]+M[153]*M[155]+
M[154]*M[156]+M[155]*M[157]+M[156]*M[158]+M[157]*M[159]+M[158]*M[160]+M[159]
*M[161]+M[160]*M[162]+M[161]*M[163]+M[162]*M[164]+M[163]*M[165]+M[164]*M[16
6]+M[165]*M[167]+M[166]*M[168]+M[167]*M[169]+M[168]*M[170]+M[169]*M[171]+M[1
70]*M[172]+M[171]*M[173]+M[172]*M[174]+M[173]*M[175]+M[174]*M[176]+M[175]*M[
177]+M[176]*M[178]+M[177]*M[179]+M[178]*M[180]+M[179]*M[181]+M[180]*M[182]+
M[181]*M[183]+M[182]*M[184]+M[183]*M[185]+M[184]*M[186]+M[185]*M[187]+M[186]
*M[188]+M[187]*M[189]+M[188]*M[190]+M[189]*M[191]+M[190]*M[192]+M[191]*M[19
3]+M[192]*M[194]+M[193]*M[195]+M[194]*M[196]+M[195]*M[197]+M[196]*M[198]+2);

   of = of +
abs(M[1]*M[9]+M[1]*M[92]+M[2]*M[10]+M[2]*M[93]+M[3]*M[11]+M[3]*M[94]+M[4]*M[
12]+M[4]*M[95]+M[5]*M[13]+M[5]*M[96]+M[6]*M[14]+M[6]*M[97]+M[7]*M[15]+M[7]*
M[98]+M[8]*M[16]+M[8]*M[99]+M[9]*M[17]+M[10]*M[18]+M[11]*M[19]+M[12]*M[20]+
M[13]*M[21]+M[14]*M[22]+M[15]*M[23]+M[16]*M[24]+M[17]*M[25]+M[18]*M[26]+M[1
9]*M[27]+M[20]*M[28]+M[21]*M[29]+M[22]*M[30]+M[23]*M[31]+M[24]*M[32]+M[25]*
M[33]+M[26]*M[34]+M[27]*M[35]+M[28]*M[36]+M[29]*M[37]+M[30]*M[38]+M[31]*M[3
```

9]+M[32]*M[40]+M[33]*M[41]+M[34]*M[42]+M[35]*M[43]+M[36]*M[44]+M[37]*M[45]+
M[38]*M[46]+M[39]*M[47]+M[40]*M[48]+M[41]*M[49]+M[42]*M[50]+M[43]*M[51]+M[4
4]*M[52]+M[45]*M[53]+M[46]*M[54]+M[47]*M[55]+M[48]*M[56]+M[49]*M[57]+M[50]*
M[58]+M[51]*M[59]+M[52]*M[60]+M[53]*M[61]+M[54]*M[62]+M[55]*M[63]+M[56]*M[6
4]+M[57]*M[65]+M[58]*M[66]+M[59]*M[67]+M[60]*M[68]+M[61]*M[69]+M[62]*M[70]+
M[63]*M[71]+M[64]*M[72]+M[65]*M[73]+M[66]*M[74]+M[67]*M[75]+M[68]*M[76]+M[6
9]*M[77]+M[70]*M[78]+M[71]*M[79]+M[72]*M[80]+M[73]*M[81]+M[74]*M[82]+M[75]*
M[83]+M[76]*M[84]+M[77]*M[85]+M[78]*M[86]+M[79]*M[87]+M[80]*M[88]+M[81]*M[8
9]+M[82]*M[90]+M[83]*M[91]+M[84]*M[92]+M[85]*M[93]+M[86]*M[94]+M[87]*M[95]+
M[88]*M[96]+M[89]*M[97]+M[90]*M[98]+M[91]*M[99]+M[100]*M[108]+M[100]*M[191]
+M[101]*M[109]+M[101]*M[192]+M[102]*M[110]+M[102]*M[193]+M[103]*M[111]+M[10
3]*M[194]+M[104]*M[112]+M[104]*M[195]+M[105]*M[113]+M[105]*M[196]+M[106]*M[1
14]+M[106]*M[197]+M[107]*M[115]+M[107]*M[198]+M[108]*M[116]+M[109]*M[117]+M[
110]*M[118]+M[111]*M[119]+M[112]*M[120]+M[113]*M[121]+M[114]*M[122]+M[115]*M
[123]+M[116]*M[124]+M[117]*M[125]+M[118]*M[126]+M[119]*M[127]+M[120]*M[128]+
M[121]*M[129]+M[122]*M[130]+M[123]*M[131]+M[124]*M[132]+M[125]*M[133]+M[126]
*M[134]+M[127]*M[135]+M[128]*M[136]+M[129]*M[137]+M[130]*M[138]+M[131]*M[13
9]+M[132]*M[140]+M[133]*M[141]+M[134]*M[142]+M[135]*M[143]+M[136]*M[144]+M[1
37]*M[145]+M[138]*M[146]+M[139]*M[147]+M[140]*M[148]+M[141]*M[149]+M[142]*M[
150]+M[143]*M[151]+M[144]*M[152]+M[145]*M[153]+M[146]*M[154]+M[147]*M[155]+
M[148]*M[156]+M[149]*M[157]+M[150]*M[158]+M[151]*M[159]+M[152]*M[160]+M[153]
*M[161]+M[154]*M[162]+M[155]*M[163]+M[156]*M[164]+M[157]*M[165]+M[158]*M[16
6]+M[159]*M[167]+M[160]*M[168]+M[161]*M[169]+M[162]*M[170]+M[163]*M[171]+M[1

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64]*M[172]+M[165]*M[173]+M[166]*M[174]+M[167]*M[175]+M[168]*M[176]+M[169]*M[
177]+M[170]*M[178]+M[171]*M[179]+M[172]*M[180]+M[173]*M[181]+M[174]*M[182]+
M[175]*M[183]+M[176]*M[184]+M[177]*M[185]+M[178]*M[186]+M[179]*M[187]+M[180]
*M[188]+M[181]*M[189]+M[182]*M[190]+M[183]*M[191]+M[184]*M[192]+M[185]*M[19
3]+M[186]*M[194]+M[187]*M[195]+M[188]*M[196]+M[189]*M[197]+M[190]*M[198]+2);

  of = of +
abs(M[1]*M[10]+M[1]*M[91]+M[2]*M[11]+M[2]*M[92]+M[3]*M[12]+M[3]*M[93]+M[4]*
M[13]+M[4]*M[94]+M[5]*M[14]+M[5]*M[95]+M[6]*M[15]+M[6]*M[96]+M[7]*M[16]+M[7
]*M[97]+M[8]*M[17]+M[8]*M[98]+M[9]*M[18]+M[9]*M[99]+M[10]*M[19]+M[11]*M[20]+
M[12]*M[21]+M[13]*M[22]+M[14]*M[23]+M[15]*M[24]+M[16]*M[25]+M[17]*M[26]+M[1
8]*M[27]+M[19]*M[28]+M[20]*M[29]+M[21]*M[30]+M[22]*M[31]+M[23]*M[32]+M[24]*
M[33]+M[25]*M[34]+M[26]*M[35]+M[27]*M[36]+M[28]*M[37]+M[29]*M[38]+M[30]*M[3
9]+M[31]*M[40]+M[32]*M[41]+M[33]*M[42]+M[34]*M[43]+M[35]*M[44]+M[36]*M[45]+
M[37]*M[46]+M[38]*M[47]+M[39]*M[48]+M[40]*M[49]+M[41]*M[50]+M[42]*M[51]+M[4
3]*M[52]+M[44]*M[53]+M[45]*M[54]+M[46]*M[55]+M[47]*M[56]+M[48]*M[57]+M[49]*
M[58]+M[50]*M[59]+M[51]*M[60]+M[52]*M[61]+M[53]*M[62]+M[54]*M[63]+M[55]*M[6
4]+M[56]*M[65]+M[57]*M[66]+M[58]*M[67]+M[59]*M[68]+M[60]*M[69]+M[61]*M[70]+
M[62]*M[71]+M[63]*M[72]+M[64]*M[73]+M[65]*M[74]+M[66]*M[75]+M[67]*M[76]+M[6
8]*M[77]+M[69]*M[78]+M[70]*M[79]+M[71]*M[80]+M[72]*M[81]+M[73]*M[82]+M[74]*
M[83]+M[75]*M[84]+M[76]*M[85]+M[77]*M[86]+M[78]*M[87]+M[79]*M[88]+M[80]*M[8
9]+M[81]*M[90]+M[82]*M[91]+M[83]*M[92]+M[84]*M[93]+M[85]*M[94]+M[86]*M[95]+
M[87]*M[96]+M[88]*M[97]+M[89]*M[98]+M[90]*M[99]+M[100]*M[109]+M[100]*M[190]
```

```
+M[101]*M[110]+M[101]*M[191]+M[102]*M[111]+M[102]*M[192]+M[103]*M[112]+M[10
3]*M[193]+M[104]*M[113]+M[104]*M[194]+M[105]*M[114]+M[105]*M[195]+M[106]*M[1
15]+M[106]*M[196]+M[107]*M[116]+M[107]*M[197]+M[108]*M[117]+M[108]*M[198]+M[
109]*M[118]+M[110]*M[119]+M[111]*M[120]+M[112]*M[121]+M[113]*M[122]+M[114]*M
[123]+M[115]*M[124]+M[116]*M[125]+M[117]*M[126]+M[118]*M[127]+M[119]*M[128]+
M[120]*M[129]+M[121]*M[130]+M[122]*M[131]+M[123]*M[132]+M[124]*M[133]+M[125]
*M[134]+M[126]*M[135]+M[127]*M[136]+M[128]*M[137]+M[129]*M[138]+M[130]*M[13
9]+M[131]*M[140]+M[132]*M[141]+M[133]*M[142]+M[134]*M[143]+M[135]*M[144]+M[1
36]*M[145]+M[137]*M[146]+M[138]*M[147]+M[139]*M[148]+M[140]*M[149]+M[141]*M[
150]+M[142]*M[151]+M[143]*M[152]+M[144]*M[153]+M[145]*M[154]+M[146]*M[155]+
M[147]*M[156]+M[148]*M[157]+M[149]*M[158]+M[150]*M[159]+M[151]*M[160]+M[152]
*M[161]+M[153]*M[162]+M[154]*M[163]+M[155]*M[164]+M[156]*M[165]+M[157]*M[16
6]+M[158]*M[167]+M[159]*M[168]+M[160]*M[169]+M[161]*M[170]+M[162]*M[171]+M[1
63]*M[172]+M[164]*M[173]+M[165]*M[174]+M[166]*M[175]+M[167]*M[176]+M[168]*M[
177]+M[169]*M[178]+M[170]*M[179]+M[171]*M[180]+M[172]*M[181]+M[173]*M[182]+
M[174]*M[183]+M[175]*M[184]+M[176]*M[185]+M[177]*M[186]+M[178]*M[187]+M[179]
*M[188]+M[180]*M[189]+M[181]*M[190]+M[182]*M[191]+M[183]*M[192]+M[184]*M[19
3]+M[185]*M[194]+M[186]*M[195]+M[187]*M[196]+M[188]*M[197]+M[189]*M[198]+2);

  of = of +
abs(M[1]*M[11]+M[1]*M[90]+M[2]*M[12]+M[2]*M[91]+M[3]*M[13]+M[3]*M[92]+M[4]*
M[14]+M[4]*M[93]+M[5]*M[15]+M[5]*M[94]+M[6]*M[16]+M[6]*M[95]+M[7]*M[17]+M[7
]*M[96]+M[8]*M[18]+M[8]*M[97]+M[9]*M[19]+M[9]*M[98]+M[10]*M[20]+M[10]*M[99]+
```

M[11]*M[21]+M[12]*M[22]+M[13]*M[23]+M[14]*M[24]+M[15]*M[25]+M[16]*M[26]+M[1
7]*M[27]+M[18]*M[28]+M[19]*M[29]+M[20]*M[30]+M[21]*M[31]+M[22]*M[32]+M[23]*
M[33]+M[24]*M[34]+M[25]*M[35]+M[26]*M[36]+M[27]*M[37]+M[28]*M[38]+M[29]*M[3
9]+M[30]*M[40]+M[31]*M[41]+M[32]*M[42]+M[33]*M[43]+M[34]*M[44]+M[35]*M[45]+
M[36]*M[46]+M[37]*M[47]+M[38]*M[48]+M[39]*M[49]+M[40]*M[50]+M[41]*M[51]+M[4
2]*M[52]+M[43]*M[53]+M[44]*M[54]+M[45]*M[55]+M[46]*M[56]+M[47]*M[57]+M[48]*
M[58]+M[49]*M[59]+M[50]*M[60]+M[51]*M[61]+M[52]*M[62]+M[53]*M[63]+M[54]*M[6
4]+M[55]*M[65]+M[56]*M[66]+M[57]*M[67]+M[58]*M[68]+M[59]*M[69]+M[60]*M[70]+
M[61]*M[71]+M[62]*M[72]+M[63]*M[73]+M[64]*M[74]+M[65]*M[75]+M[66]*M[76]+M[6
7]*M[77]+M[68]*M[78]+M[69]*M[79]+M[70]*M[80]+M[71]*M[81]+M[72]*M[82]+M[73]*
M[83]+M[74]*M[84]+M[75]*M[85]+M[76]*M[86]+M[77]*M[87]+M[78]*M[88]+M[79]*M[8
9]+M[80]*M[90]+M[81]*M[91]+M[82]*M[92]+M[83]*M[93]+M[84]*M[94]+M[85]*M[95]+
M[86]*M[96]+M[87]*M[97]+M[88]*M[98]+M[89]*M[99]+M[100]*M[110]+M[100]*M[189]
+M[101]*M[111]+M[101]*M[190]+M[102]*M[112]+M[102]*M[191]+M[103]*M[113]+M[10
3]*M[192]+M[104]*M[114]+M[104]*M[193]+M[105]*M[115]+M[105]*M[194]+M[106]*M[1
16]+M[106]*M[195]+M[107]*M[117]+M[107]*M[196]+M[108]*M[118]+M[108]*M[197]+M[
109]*M[119]+M[109]*M[198]+M[110]*M[120]+M[111]*M[121]+M[112]*M[122]+M[113]*M
[123]+M[114]*M[124]+M[115]*M[125]+M[116]*M[126]+M[117]*M[127]+M[118]*M[128]+
M[119]*M[129]+M[120]*M[130]+M[121]*M[131]+M[122]*M[132]+M[123]*M[133]+M[124]
*M[134]+M[125]*M[135]+M[126]*M[136]+M[127]*M[137]+M[128]*M[138]+M[129]*M[13
9]+M[130]*M[140]+M[131]*M[141]+M[132]*M[142]+M[133]*M[143]+M[134]*M[144]+M[1
35]*M[145]+M[136]*M[146]+M[137]*M[147]+M[138]*M[148]+M[139]*M[149]+M[140]*M[
150]+M[141]*M[151]+M[142]*M[152]+M[143]*M[153]+M[144]*M[154]+M[145]*M[155]+

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M[146]*M[156]+M[147]*M[157]+M[148]*M[158]+M[149]*M[159]+M[150]*M[160]+M[151]
*M[161]+M[152]*M[162]+M[153]*M[163]+M[154]*M[164]+M[155]*M[165]+M[156]*M[16
6]+M[157]*M[167]+M[158]*M[168]+M[159]*M[169]+M[160]*M[170]+M[161]*M[171]+M[1
62]*M[172]+M[163]*M[173]+M[164]*M[174]+M[165]*M[175]+M[166]*M[176]+M[167]*M[
177]+M[168]*M[178]+M[169]*M[179]+M[170]*M[180]+M[171]*M[181]+M[172]*M[182]+
M[173]*M[183]+M[174]*M[184]+M[175]*M[185]+M[176]*M[186]+M[177]*M[187]+M[178]
*M[188]+M[179]*M[189]+M[180]*M[190]+M[181]*M[191]+M[182]*M[192]+M[183]*M[19
3]+M[184]*M[194]+M[185]*M[195]+M[186]*M[196]+M[187]*M[197]+M[188]*M[198]+2);

   of = of +
abs(M[1]*M[6]+M[1]*M[95]+M[2]*M[7]+M[2]*M[96]+M[3]*M[8]+M[3]*M[97]+M[4]*M[9]
+M[4]*M[98]+M[5]*M[10]+M[5]*M[99]+M[6]*M[11]+M[7]*M[12]+M[8]*M[13]+M[9]*M[1
4]+M[10]*M[15]+M[11]*M[16]+M[12]*M[17]+M[13]*M[18]+M[14]*M[19]+M[15]*M[20]+
M[16]*M[21]+M[17]*M[22]+M[18]*M[23]+M[19]*M[24]+M[20]*M[25]+M[21]*M[26]+M[2
2]*M[27]+M[23]*M[28]+M[24]*M[29]+M[25]*M[30]+M[26]*M[31]+M[27]*M[32]+M[28]*
M[33]+M[29]*M[34]+M[30]*M[35]+M[31]*M[36]+M[32]*M[37]+M[33]*M[38]+M[34]*M[3
9]+M[35]*M[40]+M[36]*M[41]+M[37]*M[42]+M[38]*M[43]+M[39]*M[44]+M[40]*M[45]+
M[41]*M[46]+M[42]*M[47]+M[43]*M[48]+M[44]*M[49]+M[45]*M[50]+M[46]*M[51]+M[4
7]*M[52]+M[48]*M[53]+M[49]*M[54]+M[50]*M[55]+M[51]*M[56]+M[52]*M[57]+M[53]*
M[58]+M[54]*M[59]+M[55]*M[60]+M[56]*M[61]+M[57]*M[62]+M[58]*M[63]+M[59]*M[6
4]+M[60]*M[65]+M[61]*M[66]+M[62]*M[67]+M[63]*M[68]+M[64]*M[69]+M[65]*M[70]+
M[66]*M[71]+M[67]*M[72]+M[68]*M[73]+M[69]*M[74]+M[70]*M[75]+M[71]*M[76]+M[7
2]*M[77]+M[73]*M[78]+M[74]*M[79]+M[75]*M[80]+M[76]*M[81]+M[77]*M[82]+M[78]*
```

```
M[83]+M[79]*M[84]+M[80]*M[85]+M[81]*M[86]+M[82]*M[87]+M[83]*M[88]+M[84]*M[8
9]+M[85]*M[90]+M[86]*M[91]+M[87]*M[92]+M[88]*M[93]+M[89]*M[94]+M[90]*M[95]+
M[91]*M[96]+M[92]*M[97]+M[93]*M[98]+M[94]*M[99]+M[100]*M[105]+M[100]*M[194]
+M[101]*M[106]+M[101]*M[195]+M[102]*M[107]+M[102]*M[196]+M[103]*M[108]+M[10
3]*M[197]+M[104]*M[109]+M[104]*M[198]+M[105]*M[110]+M[106]*M[111]+M[107]*M[1
12]+M[108]*M[113]+M[109]*M[114]+M[110]*M[115]+M[111]*M[116]+M[112]*M[117]+M[
113]*M[118]+M[114]*M[119]+M[115]*M[120]+M[116]*M[121]+M[117]*M[122]+M[118]*M
[123]+M[119]*M[124]+M[120]*M[125]+M[121]*M[126]+M[122]*M[127]+M[123]*M[128]+
M[124]*M[129]+M[125]*M[130]+M[126]*M[131]+M[127]*M[132]+M[128]*M[133]+M[129]
*M[134]+M[130]*M[135]+M[131]*M[136]+M[132]*M[137]+M[133]*M[138]+M[134]*M[13
9]+M[135]*M[140]+M[136]*M[141]+M[137]*M[142]+M[138]*M[143]+M[139]*M[144]+M[1
40]*M[145]+M[141]*M[146]+M[142]*M[147]+M[143]*M[148]+M[144]*M[149]+M[145]*M[
150]+M[146]*M[151]+M[147]*M[152]+M[148]*M[153]+M[149]*M[154]+M[150]*M[155]+
M[151]*M[156]+M[152]*M[157]+M[153]*M[158]+M[154]*M[159]+M[155]*M[160]+M[156]
*M[161]+M[157]*M[162]+M[158]*M[163]+M[159]*M[164]+M[160]*M[165]+M[161]*M[16
6]+M[162]*M[167]+M[163]*M[168]+M[164]*M[169]+M[165]*M[170]+M[166]*M[171]+M[1
67]*M[172]+M[168]*M[173]+M[169]*M[174]+M[170]*M[175]+M[171]*M[176]+M[172]*M[
177]+M[173]*M[178]+M[174]*M[179]+M[175]*M[180]+M[176]*M[181]+M[177]*M[182]+
M[178]*M[183]+M[179]*M[184]+M[180]*M[185]+M[181]*M[186]+M[182]*M[187]+M[183]
*M[188]+M[184]*M[189]+M[185]*M[190]+M[186]*M[191]+M[187]*M[192]+M[188]*M[19
3]+M[189]*M[194]+M[190]*M[195]+M[191]*M[196]+M[192]*M[197]+M[193]*M[198]+2);
```

```
  of = of +
abs(M[1]*M[7]+M[1]*M[94]+M[2]*M[8]+M[2]*M[95]+M[3]*M[9]+M[3]*M[96]+M[4]*M[10
]+M[4]*M[97]+M[5]*M[11]+M[5]*M[98]+M[6]*M[12]+M[6]*M[99]+M[7]*M[13]+M[8]*M[
14]+M[9]*M[15]+M[10]*M[16]+M[11]*M[17]+M[12]*M[18]+M[13]*M[19]+M[14]*M[20]+
M[15]*M[21]+M[16]*M[22]+M[17]*M[23]+M[18]*M[24]+M[19]*M[25]+M[20]*M[26]+M[2
1]*M[27]+M[22]*M[28]+M[23]*M[29]+M[24]*M[30]+M[25]*M[31]+M[26]*M[32]+M[27]*
M[33]+M[28]*M[34]+M[29]*M[35]+M[30]*M[36]+M[31]*M[37]+M[32]*M[38]+M[33]*M[3
9]+M[34]*M[40]+M[35]*M[41]+M[36]*M[42]+M[37]*M[43]+M[38]*M[44]+M[39]*M[45]+
M[40]*M[46]+M[41]*M[47]+M[42]*M[48]+M[43]*M[49]+M[44]*M[50]+M[45]*M[51]+M[4
6]*M[52]+M[47]*M[53]+M[48]*M[54]+M[49]*M[55]+M[50]*M[56]+M[51]*M[57]+M[52]*
M[58]+M[53]*M[59]+M[54]*M[60]+M[55]*M[61]+M[56]*M[62]+M[57]*M[63]+M[58]*M[6
4]+M[59]*M[65]+M[60]*M[66]+M[61]*M[67]+M[62]*M[68]+M[63]*M[69]+M[64]*M[70]+
M[65]*M[71]+M[66]*M[72]+M[67]*M[73]+M[68]*M[74]+M[69]*M[75]+M[70]*M[76]+M[7
1]*M[77]+M[72]*M[78]+M[73]*M[79]+M[74]*M[80]+M[75]*M[81]+M[76]*M[82]+M[77]*
M[83]+M[78]*M[84]+M[79]*M[85]+M[80]*M[86]+M[81]*M[87]+M[82]*M[88]+M[83]*M[8
9]+M[84]*M[90]+M[85]*M[91]+M[86]*M[92]+M[87]*M[93]+M[88]*M[94]+M[89]*M[95]+
M[90]*M[96]+M[91]*M[97]+M[92]*M[98]+M[93]*M[99]+M[100]*M[106]+M[100]*M[193]
+M[101]*M[107]+M[101]*M[194]+M[102]*M[108]+M[102]*M[195]+M[103]*M[109]+M[10
3]*M[196]+M[104]*M[110]+M[104]*M[197]+M[105]*M[111]+M[105]*M[198]+M[106]*M[1
12]+M[107]*M[113]+M[108]*M[114]+M[109]*M[115]+M[110]*M[116]+M[111]*M[117]+M[
112]*M[118]+M[113]*M[119]+M[114]*M[120]+M[115]*M[121]+M[116]*M[122]+M[117]*M
[123]+M[118]*M[124]+M[119]*M[125]+M[120]*M[126]+M[121]*M[127]+M[122]*M[128]+
M[123]*M[129]+M[124]*M[130]+M[125]*M[131]+M[126]*M[132]+M[127]*M[133]+M[128]
```

```
*M[134]+M[129]*M[135]+M[130]*M[136]+M[131]*M[137]+M[132]*M[138]+M[133]*M[13
9]+M[134]*M[140]+M[135]*M[141]+M[136]*M[142]+M[137]*M[143]+M[138]*M[144]+M[1
39]*M[145]+M[140]*M[146]+M[141]*M[147]+M[142]*M[148]+M[143]*M[149]+M[144]*M[
150]+M[145]*M[151]+M[146]*M[152]+M[147]*M[153]+M[148]*M[154]+M[149]*M[155]+
M[150]*M[156]+M[151]*M[157]+M[152]*M[158]+M[153]*M[159]+M[154]*M[160]+M[155]
*M[161]+M[156]*M[162]+M[157]*M[163]+M[158]*M[164]+M[159]*M[165]+M[160]*M[16
6]+M[161]*M[167]+M[162]*M[168]+M[163]*M[169]+M[164]*M[170]+M[165]*M[171]+M[1
66]*M[172]+M[167]*M[173]+M[168]*M[174]+M[169]*M[175]+M[170]*M[176]+M[171]*M[
177]+M[172]*M[178]+M[173]*M[179]+M[174]*M[180]+M[175]*M[181]+M[176]*M[182]+
M[177]*M[183]+M[178]*M[184]+M[179]*M[185]+M[180]*M[186]+M[181]*M[187]+M[182]
*M[188]+M[183]*M[189]+M[184]*M[190]+M[185]*M[191]+M[186]*M[192]+M[187]*M[19
3]+M[188]*M[194]+M[189]*M[195]+M[190]*M[196]+M[191]*M[197]+M[192]*M[198]+2);

   of = of +
abs(M[1]*M[8]+M[1]*M[93]+M[2]*M[9]+M[2]*M[94]+M[3]*M[10]+M[3]*M[95]+M[4]*M[1
1]+M[4]*M[96]+M[5]*M[12]+M[5]*M[97]+M[6]*M[13]+M[6]*M[98]+M[7]*M[14]+M[7]*M
[99]+M[8]*M[15]+M[9]*M[16]+M[10]*M[17]+M[11]*M[18]+M[12]*M[19]+M[13]*M[20]+
M[14]*M[21]+M[15]*M[22]+M[16]*M[23]+M[17]*M[24]+M[18]*M[25]+M[19]*M[26]+M[2
0]*M[27]+M[21]*M[28]+M[22]*M[29]+M[23]*M[30]+M[24]*M[31]+M[25]*M[32]+M[26]*
M[33]+M[27]*M[34]+M[28]*M[35]+M[29]*M[36]+M[30]*M[37]+M[31]*M[38]+M[32]*M[3
9]+M[33]*M[40]+M[34]*M[41]+M[35]*M[42]+M[36]*M[43]+M[37]*M[44]+M[38]*M[45]+
M[39]*M[46]+M[40]*M[47]+M[41]*M[48]+M[42]*M[49]+M[43]*M[50]+M[44]*M[51]+M[4
5]*M[52]+M[46]*M[53]+M[47]*M[54]+M[48]*M[55]+M[49]*M[56]+M[50]*M[57]+M[51]*
```

M[58]+M[52]*M[59]+M[53]*M[60]+M[54]*M[61]+M[55]*M[62]+M[56]*M[63]+M[57]*M[6
4]+M[58]*M[65]+M[59]*M[66]+M[60]*M[67]+M[61]*M[68]+M[62]*M[69]+M[63]*M[70]+
M[64]*M[71]+M[65]*M[72]+M[66]*M[73]+M[67]*M[74]+M[68]*M[75]+M[69]*M[76]+M[7
0]*M[77]+M[71]*M[78]+M[72]*M[79]+M[73]*M[80]+M[74]*M[81]+M[75]*M[82]+M[76]*
M[83]+M[77]*M[84]+M[78]*M[85]+M[79]*M[86]+M[80]*M[87]+M[81]*M[88]+M[82]*M[8
9]+M[83]*M[90]+M[84]*M[91]+M[85]*M[92]+M[86]*M[93]+M[87]*M[94]+M[88]*M[95]+
M[89]*M[96]+M[90]*M[97]+M[91]*M[98]+M[92]*M[99]+M[100]*M[107]+M[100]*M[192]
+M[101]*M[108]+M[101]*M[193]+M[102]*M[109]+M[102]*M[194]+M[103]*M[110]+M[10
3]*M[195]+M[104]*M[111]+M[104]*M[196]+M[105]*M[112]+M[105]*M[197]+M[106]*M[1
13]+M[106]*M[198]+M[107]*M[114]+M[108]*M[115]+M[109]*M[116]+M[110]*M[117]+M[
111]*M[118]+M[112]*M[119]+M[113]*M[120]+M[114]*M[121]+M[115]*M[122]+M[116]*M
[123]+M[117]*M[124]+M[118]*M[125]+M[119]*M[126]+M[120]*M[127]+M[121]*M[128]+
M[122]*M[129]+M[123]*M[130]+M[124]*M[131]+M[125]*M[132]+M[126]*M[133]+M[127]
*M[134]+M[128]*M[135]+M[129]*M[136]+M[130]*M[137]+M[131]*M[138]+M[132]*M[13
9]+M[133]*M[140]+M[134]*M[141]+M[135]*M[142]+M[136]*M[143]+M[137]*M[144]+M[1
38]*M[145]+M[139]*M[146]+M[140]*M[147]+M[141]*M[148]+M[142]*M[149]+M[143]*M[
150]+M[144]*M[151]+M[145]*M[152]+M[146]*M[153]+M[147]*M[154]+M[148]*M[155]+
M[149]*M[156]+M[150]*M[157]+M[151]*M[158]+M[152]*M[159]+M[153]*M[160]+M[154]
*M[161]+M[155]*M[162]+M[156]*M[163]+M[157]*M[164]+M[158]*M[165]+M[159]*M[16
6]+M[160]*M[167]+M[161]*M[168]+M[162]*M[169]+M[163]*M[170]+M[164]*M[171]+M[1
65]*M[172]+M[166]*M[173]+M[167]*M[174]+M[168]*M[175]+M[169]*M[176]+M[170]*M[
177]+M[171]*M[178]+M[172]*M[179]+M[173]*M[180]+M[174]*M[181]+M[175]*M[182]+
M[176]*M[183]+M[177]*M[184]+M[178]*M[185]+M[179]*M[186]+M[180]*M[187]+M[181]

```
*M[188]+M[182]*M[189]+M[183]*M[190]+M[184]*M[191]+M[185]*M[192]+M[186]*M[19
3]+M[187]*M[194]+M[188]*M[195]+M[189]*M[196]+M[190]*M[197]+M[191]*M[198]+2);

   of = of +
abs(M[1]*M[5]+M[1]*M[96]+M[2]*M[6]+M[2]*M[97]+M[3]*M[7]+M[3]*M[98]+M[4]*M[8]
+M[4]*M[99]+M[5]*M[9]+M[6]*M[10]+M[7]*M[11]+M[8]*M[12]+M[9]*M[13]+M[10]*M[1
4]+M[11]*M[15]+M[12]*M[16]+M[13]*M[17]+M[14]*M[18]+M[15]*M[19]+M[16]*M[20]+
M[17]*M[21]+M[18]*M[22]+M[19]*M[23]+M[20]*M[24]+M[21]*M[25]+M[22]*M[26]+M[2
3]*M[27]+M[24]*M[28]+M[25]*M[29]+M[26]*M[30]+M[27]*M[31]+M[28]*M[32]+M[29]*
M[33]+M[30]*M[34]+M[31]*M[35]+M[32]*M[36]+M[33]*M[37]+M[34]*M[38]+M[35]*M[3
9]+M[36]*M[40]+M[37]*M[41]+M[38]*M[42]+M[39]*M[43]+M[40]*M[44]+M[41]*M[45]+
M[42]*M[46]+M[43]*M[47]+M[44]*M[48]+M[45]*M[49]+M[46]*M[50]+M[47]*M[51]+M[4
8]*M[52]+M[49]*M[53]+M[50]*M[54]+M[51]*M[55]+M[52]*M[56]+M[53]*M[57]+M[54]*
M[58]+M[55]*M[59]+M[56]*M[60]+M[57]*M[61]+M[58]*M[62]+M[59]*M[63]+M[60]*M[6
4]+M[61]*M[65]+M[62]*M[66]+M[63]*M[67]+M[64]*M[68]+M[65]*M[69]+M[66]*M[70]+
M[67]*M[71]+M[68]*M[72]+M[69]*M[73]+M[70]*M[74]+M[71]*M[75]+M[72]*M[76]+M[7
3]*M[77]+M[74]*M[78]+M[75]*M[79]+M[76]*M[80]+M[77]*M[81]+M[78]*M[82]+M[79]*
M[83]+M[80]*M[84]+M[81]*M[85]+M[82]*M[86]+M[83]*M[87]+M[84]*M[88]+M[85]*M[8
9]+M[86]*M[90]+M[87]*M[91]+M[88]*M[92]+M[89]*M[93]+M[90]*M[94]+M[91]*M[95]+
M[92]*M[96]+M[93]*M[97]+M[94]*M[98]+M[95]*M[99]+M[100]*M[104]+M[100]*M[195]
+M[101]*M[105]+M[101]*M[196]+M[102]*M[106]+M[102]*M[197]+M[103]*M[107]+M[10
3]*M[198]+M[104]*M[108]+M[105]*M[109]+M[106]*M[110]+M[107]*M[111]+M[108]*M[1
12]+M[109]*M[113]+M[110]*M[114]+M[111]*M[115]+M[112]*M[116]+M[113]*M[117]+M[
114]*M[118]+M[115]*M[119]+M[116]*M[120]+M[117]*M[121]+M[118]*M[122]+M[119]*M
[123]+M[120]*M[124]+M[121]*M[125]+M[122]*M[126]+M[123]*M[127]+M[124]*M[128]+
M[125]*M[129]+M[126]*M[130]+M[127]*M[131]+M[128]*M[132]+M[129]*M[133]+M[130]
*M[134]+M[131]*M[135]+M[132]*M[136]+M[133]*M[137]+M[134]*M[138]+M[135]*M[13
9]+M[136]*M[140]+M[137]*M[141]+M[138]*M[142]+M[139]*M[143]+M[140]*M[144]+M[1
41]*M[145]+M[142]*M[146]+M[143]*M[147]+M[144]*M[148]+M[145]*M[149]+M[146]*M[
150]+M[147]*M[151]+M[148]*M[152]+M[149]*M[153]+M[150]*M[154]+M[151]*M[155]+
M[152]*M[156]+M[153]*M[157]+M[154]*M[158]+M[155]*M[159]+M[156]*M[160]+M[157]
*M[161]+M[158]*M[162]+M[159]*M[163]+M[160]*M[164]+M[161]*M[165]+M[162]*M[16
6]+M[163]*M[167]+M[164]*M[168]+M[165]*M[169]+M[166]*M[170]+M[167]*M[171]+M[1
68]*M[172]+M[169]*M[173]+M[170]*M[174]+M[171]*M[175]+M[172]*M[176]+M[173]*M[
177]+M[174]*M[178]+M[175]*M[179]+M[176]*M[180]+M[177]*M[181]+M[178]*M[182]+
M[179]*M[183]+M[180]*M[184]+M[181]*M[185]+M[182]*M[186]+M[183]*M[187]+M[184]
*M[188]+M[185]*M[189]+M[186]*M[190]+M[187]*M[191]+M[188]*M[192]+M[189]*M[19
3]+M[190]*M[194]+M[191]*M[195]+M[192]*M[196]+M[193]*M[197]+M[194]*M[198]+2);

  of = of +
abs(M[1]*M[4]+M[1]*M[97]+M[2]*M[5]+M[2]*M[98]+M[3]*M[6]+M[3]*M[99]+M[4]*M[7]
+M[5]*M[8]+M[6]*M[9]+M[7]*M[10]+M[8]*M[11]+M[9]*M[12]+M[10]*M[13]+M[11]*M[1
4]+M[12]*M[15]+M[13]*M[16]+M[14]*M[17]+M[15]*M[18]+M[16]*M[19]+M[17]*M[20]+
M[18]*M[21]+M[19]*M[22]+M[20]*M[23]+M[21]*M[24]+M[22]*M[25]+M[23]*M[26]+M[2
4]*M[27]+M[25]*M[28]+M[26]*M[29]+M[27]*M[30]+M[28]*M[31]+M[29]*M[32]+M[30]*
M[33]+M[31]*M[34]+M[32]*M[35]+M[33]*M[36]+M[34]*M[37]+M[35]*M[38]+M[36]*M[3
```

```
9]+M[37]*M[40]+M[38]*M[41]+M[39]*M[42]+M[40]*M[43]+M[41]*M[44]+M[42]*M[45]+
M[43]*M[46]+M[44]*M[47]+M[45]*M[48]+M[46]*M[49]+M[47]*M[50]+M[48]*M[51]+M[4
9]*M[52]+M[50]*M[53]+M[51]*M[54]+M[52]*M[55]+M[53]*M[56]+M[54]*M[57]+M[55]*
M[58]+M[56]*M[59]+M[57]*M[60]+M[58]*M[61]+M[59]*M[62]+M[60]*M[63]+M[61]*M[6
4]+M[62]*M[65]+M[63]*M[66]+M[64]*M[67]+M[65]*M[68]+M[66]*M[69]+M[67]*M[70]+
M[68]*M[71]+M[69]*M[72]+M[70]*M[73]+M[71]*M[74]+M[72]*M[75]+M[73]*M[76]+M[7
4]*M[77]+M[75]*M[78]+M[76]*M[79]+M[77]*M[80]+M[78]*M[81]+M[79]*M[82]+M[80]*
M[83]+M[81]*M[84]+M[82]*M[85]+M[83]*M[86]+M[84]*M[87]+M[85]*M[88]+M[86]*M[8
9]+M[87]*M[90]+M[88]*M[91]+M[89]*M[92]+M[90]*M[93]+M[91]*M[94]+M[92]*M[95]+
M[93]*M[96]+M[94]*M[97]+M[95]*M[98]+M[96]*M[99]+M[100]*M[103]+M[100]*M[196]
+M[101]*M[104]+M[101]*M[197]+M[102]*M[105]+M[102]*M[198]+M[103]*M[106]+M[10
4]*M[107]+M[105]*M[108]+M[106]*M[109]+M[107]*M[110]+M[108]*M[111]+M[109]*M[1
12]+M[110]*M[113]+M[111]*M[114]+M[112]*M[115]+M[113]*M[116]+M[114]*M[117]+M[
115]*M[118]+M[116]*M[119]+M[117]*M[120]+M[118]*M[121]+M[119]*M[122]+M[120]*M
[123]+M[121]*M[124]+M[122]*M[125]+M[123]*M[126]+M[124]*M[127]+M[125]*M[128]+
M[126]*M[129]+M[127]*M[130]+M[128]*M[131]+M[129]*M[132]+M[130]*M[133]+M[131]
*M[134]+M[132]*M[135]+M[133]*M[136]+M[134]*M[137]+M[135]*M[138]+M[136]*M[13
9]+M[137]*M[140]+M[138]*M[141]+M[139]*M[142]+M[140]*M[143]+M[141]*M[144]+M[1
42]*M[145]+M[143]*M[146]+M[144]*M[147]+M[145]*M[148]+M[146]*M[149]+M[147]*M[
150]+M[148]*M[151]+M[149]*M[152]+M[150]*M[153]+M[151]*M[154]+M[152]*M[155]+
M[153]*M[156]+M[154]*M[157]+M[155]*M[158]+M[156]*M[159]+M[157]*M[160]+M[158]
*M[161]+M[159]*M[162]+M[160]*M[163]+M[161]*M[164]+M[162]*M[165]+M[163]*M[16
6]+M[164]*M[167]+M[165]*M[168]+M[166]*M[169]+M[167]*M[170]+M[168]*M[171]+M[1
```

```
69]*M[172]+M[170]*M[173]+M[171]*M[174]+M[172]*M[175]+M[173]*M[176]+M[174]*M[
177]+M[175]*M[178]+M[176]*M[179]+M[177]*M[180]+M[178]*M[181]+M[179]*M[182]+
M[180]*M[183]+M[181]*M[184]+M[182]*M[185]+M[183]*M[186]+M[184]*M[187]+M[185]
*M[188]+M[186]*M[189]+M[187]*M[190]+M[188]*M[191]+M[189]*M[192]+M[190]*M[19
3]+M[191]*M[194]+M[192]*M[195]+M[193]*M[196]+M[194]*M[197]+M[195]*M[198]+2);

  of = of +
abs(M[1]*M[31]+M[1]*M[70]+M[2]*M[32]+M[2]*M[71]+M[3]*M[33]+M[3]*M[72]+M[4]*
M[34]+M[4]*M[73]+M[5]*M[35]+M[5]*M[74]+M[6]*M[36]+M[6]*M[75]+M[7]*M[37]+M[7
]*M[76]+M[8]*M[38]+M[8]*M[77]+M[9]*M[39]+M[9]*M[78]+M[10]*M[40]+M[10]*M[79]+
M[11]*M[41]+M[11]*M[80]+M[12]*M[42]+M[12]*M[81]+M[13]*M[43]+M[13]*M[82]+M[1
4]*M[44]+M[14]*M[83]+M[15]*M[45]+M[15]*M[84]+M[16]*M[46]+M[16]*M[85]+M[17]*
M[47]+M[17]*M[86]+M[18]*M[48]+M[18]*M[87]+M[19]*M[49]+M[19]*M[88]+M[20]*M[5
0]+M[20]*M[89]+M[21]*M[51]+M[21]*M[90]+M[22]*M[52]+M[22]*M[91]+M[23]*M[53]+
M[23]*M[92]+M[24]*M[54]+M[24]*M[93]+M[25]*M[55]+M[25]*M[94]+M[26]*M[56]+M[2
6]*M[95]+M[27]*M[57]+M[27]*M[96]+M[28]*M[58]+M[28]*M[97]+M[29]*M[59]+M[29]*
M[98]+M[30]*M[60]+M[30]*M[99]+M[31]*M[61]+M[32]*M[62]+M[33]*M[63]+M[34]*M[6
4]+M[35]*M[65]+M[36]*M[66]+M[37]*M[67]+M[38]*M[68]+M[39]*M[69]+M[40]*M[70]+
M[41]*M[71]+M[42]*M[72]+M[43]*M[73]+M[44]*M[74]+M[45]*M[75]+M[46]*M[76]+M[4
7]*M[77]+M[48]*M[78]+M[49]*M[79]+M[50]*M[80]+M[51]*M[81]+M[52]*M[82]+M[53]*
M[83]+M[54]*M[84]+M[55]*M[85]+M[56]*M[86]+M[57]*M[87]+M[58]*M[88]+M[59]*M[8
9]+M[60]*M[90]+M[61]*M[91]+M[62]*M[92]+M[63]*M[93]+M[64]*M[94]+M[65]*M[95]+
M[66]*M[96]+M[67]*M[97]+M[68]*M[98]+M[69]*M[99]+M[100]*M[130]+M[100]*M[169]
```

```
+M[101]*M[131]+M[101]*M[170]+M[102]*M[132]+M[102]*M[171]+M[103]*M[133]+M[10
3]*M[172]+M[104]*M[134]+M[104]*M[173]+M[105]*M[135]+M[105]*M[174]+M[106]*M[1
36]+M[106]*M[175]+M[107]*M[137]+M[107]*M[176]+M[108]*M[138]+M[108]*M[177]+M[
109]*M[139]+M[109]*M[178]+M[110]*M[140]+M[110]*M[179]+M[111]*M[141]+M[111]*M
[180]+M[112]*M[142]+M[112]*M[181]+M[113]*M[143]+M[113]*M[182]+M[114]*M[144]+
M[114]*M[183]+M[115]*M[145]+M[115]*M[184]+M[116]*M[146]+M[116]*M[185]+M[117]
*M[147]+M[117]*M[186]+M[118]*M[148]+M[118]*M[187]+M[119]*M[149]+M[119]*M[188
]+M[120]*M[150]+M[120]*M[189]+M[121]*M[151]+M[121]*M[190]+M[122]*M[152]+M[12
2]*M[191]+M[123]*M[153]+M[123]*M[192]+M[124]*M[154]+M[124]*M[193]+M[125]*M[1
55]+M[125]*M[194]+M[126]*M[156]+M[126]*M[195]+M[127]*M[157]+M[127]*M[196]+M[
128]*M[158]+M[128]*M[197]+M[129]*M[159]+M[129]*M[198]+M[130]*M[160]+M[131]*
M[161]+M[132]*M[162]+M[133]*M[163]+M[134]*M[164]+M[135]*M[165]+M[136]*M[166]
+M[137]*M[167]+M[138]*M[168]+M[139]*M[169]+M[140]*M[170]+M[141]*M[171]+M[14
2]*M[172]+M[143]*M[173]+M[144]*M[174]+M[145]*M[175]+M[146]*M[176]+M[147]*M[1
77]+M[148]*M[178]+M[149]*M[179]+M[150]*M[180]+M[151]*M[181]+M[152]*M[182]+M[
153]*M[183]+M[154]*M[184]+M[155]*M[185]+M[156]*M[186]+M[157]*M[187]+M[158]*
M[188]+M[159]*M[189]+M[160]*M[190]+M[161]*M[191]+M[162]*M[192]+M[163]*M[193]
+M[164]*M[194]+M[165]*M[195]+M[166]*M[196]+M[167]*M[197]+M[168]*M[198]+2);

  of = of +
abs(M[1]*M[32]+M[1]*M[69]+M[2]*M[33]+M[2]*M[70]+M[3]*M[34]+M[3]*M[71]+M[4]*
M[35]+M[4]*M[72]+M[5]*M[36]+M[5]*M[73]+M[6]*M[37]+M[6]*M[74]+M[7]*M[38]+M[7
]*M[75]+M[8]*M[39]+M[8]*M[76]+M[9]*M[40]+M[9]*M[77]+M[10]*M[41]+M[10]*M[78]+
```

M[11]*M[42]+M[11]*M[79]+M[12]*M[43]+M[12]*M[80]+M[13]*M[44]+M[13]*M[81]+M[1
4]*M[45]+M[14]*M[82]+M[15]*M[46]+M[15]*M[83]+M[16]*M[47]+M[16]*M[84]+M[17]*
M[48]+M[17]*M[85]+M[18]*M[49]+M[18]*M[86]+M[19]*M[50]+M[19]*M[87]+M[20]*M[5
1]+M[20]*M[88]+M[21]*M[52]+M[21]*M[89]+M[22]*M[53]+M[22]*M[90]+M[23]*M[54]+
M[23]*M[91]+M[24]*M[55]+M[24]*M[92]+M[25]*M[56]+M[25]*M[93]+M[26]*M[57]+M[2
6]*M[94]+M[27]*M[58]+M[27]*M[95]+M[28]*M[59]+M[28]*M[96]+M[29]*M[60]+M[29]*
M[97]+M[30]*M[61]+M[30]*M[98]+M[31]*M[62]+M[31]*M[99]+M[32]*M[63]+M[33]*M[6
4]+M[34]*M[65]+M[35]*M[66]+M[36]*M[67]+M[37]*M[68]+M[38]*M[69]+M[39]*M[70]+
M[40]*M[71]+M[41]*M[72]+M[42]*M[73]+M[43]*M[74]+M[44]*M[75]+M[45]*M[76]+M[4
6]*M[77]+M[47]*M[78]+M[48]*M[79]+M[49]*M[80]+M[50]*M[81]+M[51]*M[82]+M[52]*
M[83]+M[53]*M[84]+M[54]*M[85]+M[55]*M[86]+M[56]*M[87]+M[57]*M[88]+M[58]*M[8
9]+M[59]*M[90]+M[60]*M[91]+M[61]*M[92]+M[62]*M[93]+M[63]*M[94]+M[64]*M[95]+
M[65]*M[96]+M[66]*M[97]+M[67]*M[98]+M[68]*M[99]+M[100]*M[131]+M[100]*M[168]
+M[101]*M[132]+M[101]*M[169]+M[102]*M[133]+M[102]*M[170]+M[103]*M[134]+M[10
3]*M[171]+M[104]*M[135]+M[104]*M[172]+M[105]*M[136]+M[105]*M[173]+M[106]*M[1
37]+M[106]*M[174]+M[107]*M[138]+M[107]*M[175]+M[108]*M[139]+M[108]*M[176]+M[
109]*M[140]+M[109]*M[177]+M[110]*M[141]+M[110]*M[178]+M[111]*M[142]+M[111]*M
[179]+M[112]*M[143]+M[112]*M[180]+M[113]*M[144]+M[113]*M[181]+M[114]*M[145]+
M[114]*M[182]+M[115]*M[146]+M[115]*M[183]+M[116]*M[147]+M[116]*M[184]+M[117]
*M[148]+M[117]*M[185]+M[118]*M[149]+M[118]*M[186]+M[119]*M[150]+M[119]*M[187
]+M[120]*M[151]+M[120]*M[188]+M[121]*M[152]+M[121]*M[189]+M[122]*M[153]+M[12
2]*M[190]+M[123]*M[154]+M[123]*M[191]+M[124]*M[155]+M[124]*M[192]+M[125]*M[1
56]+M[125]*M[193]+M[126]*M[157]+M[126]*M[194]+M[127]*M[158]+M[127]*M[195]+M[

```
128]*M[159]+M[128]*M[196]+M[129]*M[160]+M[129]*M[197]+M[130]*M[161]+M[130]*
M[198]+M[131]*M[162]+M[132]*M[163]+M[133]*M[164]+M[134]*M[165]+M[135]*M[166]
+M[136]*M[167]+M[137]*M[168]+M[138]*M[169]+M[139]*M[170]+M[140]*M[171]+M[14
1]*M[172]+M[142]*M[173]+M[143]*M[174]+M[144]*M[175]+M[145]*M[176]+M[146]*M[1
77]+M[147]*M[178]+M[148]*M[179]+M[149]*M[180]+M[150]*M[181]+M[151]*M[182]+M[
152]*M[183]+M[153]*M[184]+M[154]*M[185]+M[155]*M[186]+M[156]*M[187]+M[157]*
M[188]+M[158]*M[189]+M[159]*M[190]+M[160]*M[191]+M[161]*M[192]+M[162]*M[193]
+M[163]*M[194]+M[164]*M[195]+M[165]*M[196]+M[166]*M[197]+M[167]*M[198]+2);

  of = of +
abs(M[1]*M[30]+M[1]*M[71]+M[2]*M[31]+M[2]*M[72]+M[3]*M[32]+M[3]*M[73]+M[4]*
M[33]+M[4]*M[74]+M[5]*M[34]+M[5]*M[75]+M[6]*M[35]+M[6]*M[76]+M[7]*M[36]+M[7
]*M[77]+M[8]*M[37]+M[8]*M[78]+M[9]*M[38]+M[9]*M[79]+M[10]*M[39]+M[10]*M[80]+
M[11]*M[40]+M[11]*M[81]+M[12]*M[41]+M[12]*M[82]+M[13]*M[42]+M[13]*M[83]+M[1
4]*M[43]+M[14]*M[84]+M[15]*M[44]+M[15]*M[85]+M[16]*M[45]+M[16]*M[86]+M[17]*
M[46]+M[17]*M[87]+M[18]*M[47]+M[18]*M[88]+M[19]*M[48]+M[19]*M[89]+M[20]*M[4
9]+M[20]*M[90]+M[21]*M[50]+M[21]*M[91]+M[22]*M[51]+M[22]*M[92]+M[23]*M[52]+
M[23]*M[93]+M[24]*M[53]+M[24]*M[94]+M[25]*M[54]+M[25]*M[95]+M[26]*M[55]+M[2
6]*M[96]+M[27]*M[56]+M[27]*M[97]+M[28]*M[57]+M[28]*M[98]+M[29]*M[58]+M[29]*
M[99]+M[30]*M[59]+M[31]*M[60]+M[32]*M[61]+M[33]*M[62]+M[34]*M[63]+M[35]*M[6
4]+M[36]*M[65]+M[37]*M[66]+M[38]*M[67]+M[39]*M[68]+M[40]*M[69]+M[41]*M[70]+
M[42]*M[71]+M[43]*M[72]+M[44]*M[73]+M[45]*M[74]+M[46]*M[75]+M[47]*M[76]+M[4
8]*M[77]+M[49]*M[78]+M[50]*M[79]+M[51]*M[80]+M[52]*M[81]+M[53]*M[82]+M[54]*
```

```
M[83]+M[55]*M[84]+M[56]*M[85]+M[57]*M[86]+M[58]*M[87]+M[59]*M[88]+M[60]*M[8
9]+M[61]*M[90]+M[62]*M[91]+M[63]*M[92]+M[64]*M[93]+M[65]*M[94]+M[66]*M[95]+
M[67]*M[96]+M[68]*M[97]+M[69]*M[98]+M[70]*M[99]+M[100]*M[129]+M[100]*M[170]
+M[101]*M[130]+M[101]*M[171]+M[102]*M[131]+M[102]*M[172]+M[103]*M[132]+M[10
3]*M[173]+M[104]*M[133]+M[104]*M[174]+M[105]*M[134]+M[105]*M[175]+M[106]*M[1
35]+M[106]*M[176]+M[107]*M[136]+M[107]*M[177]+M[108]*M[137]+M[108]*M[178]+M[
109]*M[138]+M[109]*M[179]+M[110]*M[139]+M[110]*M[180]+M[111]*M[140]+M[111]*M
[181]+M[112]*M[141]+M[112]*M[182]+M[113]*M[142]+M[113]*M[183]+M[114]*M[143]+
M[114]*M[184]+M[115]*M[144]+M[115]*M[185]+M[116]*M[145]+M[116]*M[186]+M[117]
*M[146]+M[117]*M[187]+M[118]*M[147]+M[118]*M[188]+M[119]*M[148]+M[119]*M[189
]+M[120]*M[149]+M[120]*M[190]+M[121]*M[150]+M[121]*M[191]+M[122]*M[151]+M[12
2]*M[192]+M[123]*M[152]+M[123]*M[193]+M[124]*M[153]+M[124]*M[194]+M[125]*M[1
54]+M[125]*M[195]+M[126]*M[155]+M[126]*M[196]+M[127]*M[156]+M[127]*M[197]+M[
128]*M[157]+M[128]*M[198]+M[129]*M[158]+M[130]*M[159]+M[131]*M[160]+M[132]*
M[161]+M[133]*M[162]+M[134]*M[163]+M[135]*M[164]+M[136]*M[165]+M[137]*M[166]
+M[138]*M[167]+M[139]*M[168]+M[140]*M[169]+M[141]*M[170]+M[142]*M[171]+M[14
3]*M[172]+M[144]*M[173]+M[145]*M[174]+M[146]*M[175]+M[147]*M[176]+M[148]*M[1
77]+M[149]*M[178]+M[150]*M[179]+M[151]*M[180]+M[152]*M[181]+M[153]*M[182]+M[
154]*M[183]+M[155]*M[184]+M[156]*M[185]+M[157]*M[186]+M[158]*M[187]+M[159]*
M[188]+M[160]*M[189]+M[161]*M[190]+M[162]*M[191]+M[163]*M[192]+M[164]*M[193]
+M[165]*M[194]+M[166]*M[195]+M[167]*M[196]+M[168]*M[197]+M[169]*M[198]+2);
```

```
of = of +
abs(M[1]*M[29]+M[1]*M[72]+M[2]*M[30]+M[2]*M[73]+M[3]*M[31]+M[3]*M[74]+M[4]*
M[32]+M[4]*M[75]+M[5]*M[33]+M[5]*M[76]+M[6]*M[34]+M[6]*M[77]+M[7]*M[35]+M[7
]*M[78]+M[8]*M[36]+M[8]*M[79]+M[9]*M[37]+M[9]*M[80]+M[10]*M[38]+M[10]*M[81]+
M[11]*M[39]+M[11]*M[82]+M[12]*M[40]+M[12]*M[83]+M[13]*M[41]+M[13]*M[84]+M[1
4]*M[42]+M[14]*M[85]+M[15]*M[43]+M[15]*M[86]+M[16]*M[44]+M[16]*M[87]+M[17]*
M[45]+M[17]*M[88]+M[18]*M[46]+M[18]*M[89]+M[19]*M[47]+M[19]*M[90]+M[20]*M[4
8]+M[20]*M[91]+M[21]*M[49]+M[21]*M[92]+M[22]*M[50]+M[22]*M[93]+M[23]*M[51]+
M[23]*M[94]+M[24]*M[52]+M[24]*M[95]+M[25]*M[53]+M[25]*M[96]+M[26]*M[54]+M[2
6]*M[97]+M[27]*M[55]+M[27]*M[98]+M[28]*M[56]+M[28]*M[99]+M[29]*M[57]+M[30]*
M[58]+M[31]*M[59]+M[32]*M[60]+M[33]*M[61]+M[34]*M[62]+M[35]*M[63]+M[36]*M[6
4]+M[37]*M[65]+M[38]*M[66]+M[39]*M[67]+M[40]*M[68]+M[41]*M[69]+M[42]*M[70]+
M[43]*M[71]+M[44]*M[72]+M[45]*M[73]+M[46]*M[74]+M[47]*M[75]+M[48]*M[76]+M[4
9]*M[77]+M[50]*M[78]+M[51]*M[79]+M[52]*M[80]+M[53]*M[81]+M[54]*M[82]+M[55]*
M[83]+M[56]*M[84]+M[57]*M[85]+M[58]*M[86]+M[59]*M[87]+M[60]*M[88]+M[61]*M[8
9]+M[62]*M[90]+M[63]*M[91]+M[64]*M[92]+M[65]*M[93]+M[66]*M[94]+M[67]*M[95]+
M[68]*M[96]+M[69]*M[97]+M[70]*M[98]+M[71]*M[99]+M[100]*M[128]+M[100]*M[171]
+M[101]*M[129]+M[101]*M[172]+M[102]*M[130]+M[102]*M[173]+M[103]*M[131]+M[10
3]*M[174]+M[104]*M[132]+M[104]*M[175]+M[105]*M[133]+M[105]*M[176]+M[106]*M[1
34]+M[106]*M[177]+M[107]*M[135]+M[107]*M[178]+M[108]*M[136]+M[108]*M[179]+M[
109]*M[137]+M[109]*M[180]+M[110]*M[138]+M[110]*M[181]+M[111]*M[139]+M[111]*M
[182]+M[112]*M[140]+M[112]*M[183]+M[113]*M[141]+M[113]*M[184]+M[114]*M[142]+
M[114]*M[185]+M[115]*M[143]+M[115]*M[186]+M[116]*M[144]+M[116]*M[187]+M[117]
```

```
*M[145]+M[117]*M[188]+M[118]*M[146]+M[118]*M[189]+M[119]*M[147]+M[119]*M[190
]+M[120]*M[148]+M[120]*M[191]+M[121]*M[149]+M[121]*M[192]+M[122]*M[150]+M[12
2]*M[193]+M[123]*M[151]+M[123]*M[194]+M[124]*M[152]+M[124]*M[195]+M[125]*M[1
53]+M[125]*M[196]+M[126]*M[154]+M[126]*M[197]+M[127]*M[155]+M[127]*M[198]+M[
128]*M[156]+M[129]*M[157]+M[130]*M[158]+M[131]*M[159]+M[132]*M[160]+M[133]*
M[161]+M[134]*M[162]+M[135]*M[163]+M[136]*M[164]+M[137]*M[165]+M[138]*M[166]
+M[139]*M[167]+M[140]*M[168]+M[141]*M[169]+M[142]*M[170]+M[143]*M[171]+M[14
4]*M[172]+M[145]*M[173]+M[146]*M[174]+M[147]*M[175]+M[148]*M[176]+M[149]*M[1
77]+M[150]*M[178]+M[151]*M[179]+M[152]*M[180]+M[153]*M[181]+M[154]*M[182]+M[
155]*M[183]+M[156]*M[184]+M[157]*M[185]+M[158]*M[186]+M[159]*M[187]+M[160]*
M[188]+M[161]*M[189]+M[162]*M[190]+M[163]*M[191]+M[164]*M[192]+M[165]*M[193]
+M[166]*M[194]+M[167]*M[195]+M[168]*M[196]+M[169]*M[197]+M[170]*M[198]+2);

  of = of +
abs(M[1]*M[28]+M[1]*M[73]+M[2]*M[29]+M[2]*M[74]+M[3]*M[30]+M[3]*M[75]+M[4]*
M[31]+M[4]*M[76]+M[5]*M[32]+M[5]*M[77]+M[6]*M[33]+M[6]*M[78]+M[7]*M[34]+M[7
]*M[79]+M[8]*M[35]+M[8]*M[80]+M[9]*M[36]+M[9]*M[81]+M[10]*M[37]+M[10]*M[82]+
M[11]*M[38]+M[11]*M[83]+M[12]*M[39]+M[12]*M[84]+M[13]*M[40]+M[13]*M[85]+M[1
4]*M[41]+M[14]*M[86]+M[15]*M[42]+M[15]*M[87]+M[16]*M[43]+M[16]*M[88]+M[17]*
M[44]+M[17]*M[89]+M[18]*M[45]+M[18]*M[90]+M[19]*M[46]+M[19]*M[91]+M[20]*M[4
7]+M[20]*M[92]+M[21]*M[48]+M[21]*M[93]+M[22]*M[49]+M[22]*M[94]+M[23]*M[50]+
M[23]*M[95]+M[24]*M[51]+M[24]*M[96]+M[25]*M[52]+M[25]*M[97]+M[26]*M[53]+M[2
6]*M[98]+M[27]*M[54]+M[27]*M[99]+M[28]*M[55]+M[29]*M[56]+M[30]*M[57]+M[31]*
```

```
M[58]+M[32]*M[59]+M[33]*M[60]+M[34]*M[61]+M[35]*M[62]+M[36]*M[63]+M[37]*M[6
4]+M[38]*M[65]+M[39]*M[66]+M[40]*M[67]+M[41]*M[68]+M[42]*M[69]+M[43]*M[70]+
M[44]*M[71]+M[45]*M[72]+M[46]*M[73]+M[47]*M[74]+M[48]*M[75]+M[49]*M[76]+M[5
0]*M[77]+M[51]*M[78]+M[52]*M[79]+M[53]*M[80]+M[54]*M[81]+M[55]*M[82]+M[56]*
M[83]+M[57]*M[84]+M[58]*M[85]+M[59]*M[86]+M[60]*M[87]+M[61]*M[88]+M[62]*M[8
9]+M[63]*M[90]+M[64]*M[91]+M[65]*M[92]+M[66]*M[93]+M[67]*M[94]+M[68]*M[95]+
M[69]*M[96]+M[70]*M[97]+M[71]*M[98]+M[72]*M[99]+M[100]*M[127]+M[100]*M[172]
+M[101]*M[128]+M[101]*M[173]+M[102]*M[129]+M[102]*M[174]+M[103]*M[130]+M[10
3]*M[175]+M[104]*M[131]+M[104]*M[176]+M[105]*M[132]+M[105]*M[177]+M[106]*M[1
33]+M[106]*M[178]+M[107]*M[134]+M[107]*M[179]+M[108]*M[135]+M[108]*M[180]+M[
109]*M[136]+M[109]*M[181]+M[110]*M[137]+M[110]*M[182]+M[111]*M[138]+M[111]*M
[183]+M[112]*M[139]+M[112]*M[184]+M[113]*M[140]+M[113]*M[185]+M[114]*M[141]+
M[114]*M[186]+M[115]*M[142]+M[115]*M[187]+M[116]*M[143]+M[116]*M[188]+M[117]
*M[144]+M[117]*M[189]+M[118]*M[145]+M[118]*M[190]+M[119]*M[146]+M[119]*M[191
]+M[120]*M[147]+M[120]*M[192]+M[121]*M[148]+M[121]*M[193]+M[122]*M[149]+M[12
2]*M[194]+M[123]*M[150]+M[123]*M[195]+M[124]*M[151]+M[124]*M[196]+M[125]*M[1
52]+M[125]*M[197]+M[126]*M[153]+M[126]*M[198]+M[127]*M[154]+M[128]*M[155]+M[
129]*M[156]+M[130]*M[157]+M[131]*M[158]+M[132]*M[159]+M[133]*M[160]+M[134]*
M[161]+M[135]*M[162]+M[136]*M[163]+M[137]*M[164]+M[138]*M[165]+M[139]*M[166]
+M[140]*M[167]+M[141]*M[168]+M[142]*M[169]+M[143]*M[170]+M[144]*M[171]+M[14
5]*M[172]+M[146]*M[173]+M[147]*M[174]+M[148]*M[175]+M[149]*M[176]+M[150]*M[1
77]+M[151]*M[178]+M[152]*M[179]+M[153]*M[180]+M[154]*M[181]+M[155]*M[182]+M[
156]*M[183]+M[157]*M[184]+M[158]*M[185]+M[159]*M[186]+M[160]*M[187]+M[161]*
```

```
M[188]+M[162]*M[189]+M[163]*M[190]+M[164]*M[191]+M[165]*M[192]+M[166]*M[193]
+M[167]*M[194]+M[168]*M[195]+M[169]*M[196]+M[170]*M[197]+M[171]*M[198]+2);

   of = of +
abs(M[1]*M[27]+M[1]*M[74]+M[2]*M[28]+M[2]*M[75]+M[3]*M[29]+M[3]*M[76]+M[4]*
M[30]+M[4]*M[77]+M[5]*M[31]+M[5]*M[78]+M[6]*M[32]+M[6]*M[79]+M[7]*M[33]+M[7
]*M[80]+M[8]*M[34]+M[8]*M[81]+M[9]*M[35]+M[9]*M[82]+M[10]*M[36]+M[10]*M[83]+
M[11]*M[37]+M[11]*M[84]+M[12]*M[38]+M[12]*M[85]+M[13]*M[39]+M[13]*M[86]+M[1
4]*M[40]+M[14]*M[87]+M[15]*M[41]+M[15]*M[88]+M[16]*M[42]+M[16]*M[89]+M[17]*
M[43]+M[17]*M[90]+M[18]*M[44]+M[18]*M[91]+M[19]*M[45]+M[19]*M[92]+M[20]*M[4
6]+M[20]*M[93]+M[21]*M[47]+M[21]*M[94]+M[22]*M[48]+M[22]*M[95]+M[23]*M[49]+
M[23]*M[96]+M[24]*M[50]+M[24]*M[97]+M[25]*M[51]+M[25]*M[98]+M[26]*M[52]+M[2
6]*M[99]+M[27]*M[53]+M[28]*M[54]+M[29]*M[55]+M[30]*M[56]+M[31]*M[57]+M[32]*
M[58]+M[33]*M[59]+M[34]*M[60]+M[35]*M[61]+M[36]*M[62]+M[37]*M[63]+M[38]*M[6
4]+M[39]*M[65]+M[40]*M[66]+M[41]*M[67]+M[42]*M[68]+M[43]*M[69]+M[44]*M[70]+
M[45]*M[71]+M[46]*M[72]+M[47]*M[73]+M[48]*M[74]+M[49]*M[75]+M[50]*M[76]+M[5
1]*M[77]+M[52]*M[78]+M[53]*M[79]+M[54]*M[80]+M[55]*M[81]+M[56]*M[82]+M[57]*
M[83]+M[58]*M[84]+M[59]*M[85]+M[60]*M[86]+M[61]*M[87]+M[62]*M[88]+M[63]*M[8
9]+M[64]*M[90]+M[65]*M[91]+M[66]*M[92]+M[67]*M[93]+M[68]*M[94]+M[69]*M[95]+
M[70]*M[96]+M[71]*M[97]+M[72]*M[98]+M[73]*M[99]+M[100]*M[126]+M[100]*M[173]
+M[101]*M[127]+M[101]*M[174]+M[102]*M[128]+M[102]*M[175]+M[103]*M[129]+M[10
3]*M[176]+M[104]*M[130]+M[104]*M[177]+M[105]*M[131]+M[105]*M[178]+M[106]*M[1
32]+M[106]*M[179]+M[107]*M[133]+M[107]*M[180]+M[108]*M[134]+M[108]*M[181]+M[
109]*M[135]+M[109]*M[182]+M[110]*M[136]+M[110]*M[183]+M[111]*M[137]+M[111]*M
[184]+M[112]*M[138]+M[112]*M[185]+M[113]*M[139]+M[113]*M[186]+M[114]*M[140]+
M[114]*M[187]+M[115]*M[141]+M[115]*M[188]+M[116]*M[142]+M[116]*M[189]+M[117]
*M[143]+M[117]*M[190]+M[118]*M[144]+M[118]*M[191]+M[119]*M[145]+M[119]*M[192
]+M[120]*M[146]+M[120]*M[193]+M[121]*M[147]+M[121]*M[194]+M[122]*M[148]+M[12
2]*M[195]+M[123]*M[149]+M[123]*M[196]+M[124]*M[150]+M[124]*M[197]+M[125]*M[1
51]+M[125]*M[198]+M[126]*M[152]+M[127]*M[153]+M[128]*M[154]+M[129]*M[155]+M[
130]*M[156]+M[131]*M[157]+M[132]*M[158]+M[133]*M[159]+M[134]*M[160]+M[135]*
M[161]+M[136]*M[162]+M[137]*M[163]+M[138]*M[164]+M[139]*M[165]+M[140]*M[166]
+M[141]*M[167]+M[142]*M[168]+M[143]*M[169]+M[144]*M[170]+M[145]*M[171]+M[14
6]*M[172]+M[147]*M[173]+M[148]*M[174]+M[149]*M[175]+M[150]*M[176]+M[151]*M[1
77]+M[152]*M[178]+M[153]*M[179]+M[154]*M[180]+M[155]*M[181]+M[156]*M[182]+M[
157]*M[183]+M[158]*M[184]+M[159]*M[185]+M[160]*M[186]+M[161]*M[187]+M[162]*
M[188]+M[163]*M[189]+M[164]*M[190]+M[165]*M[191]+M[166]*M[192]+M[167]*M[193]
+M[168]*M[194]+M[169]*M[195]+M[170]*M[196]+M[171]*M[197]+M[172]*M[198]+2);

   of = of +
abs(M[1]*M[25]+M[1]*M[76]+M[2]*M[26]+M[2]*M[77]+M[3]*M[27]+M[3]*M[78]+M[4]*
M[28]+M[4]*M[79]+M[5]*M[29]+M[5]*M[80]+M[6]*M[30]+M[6]*M[81]+M[7]*M[31]+M[7
]*M[82]+M[8]*M[32]+M[8]*M[83]+M[9]*M[33]+M[9]*M[84]+M[10]*M[34]+M[10]*M[85]+
M[11]*M[35]+M[11]*M[86]+M[12]*M[36]+M[12]*M[87]+M[13]*M[37]+M[13]*M[88]+M[1
4]*M[38]+M[14]*M[89]+M[15]*M[39]+M[15]*M[90]+M[16]*M[40]+M[16]*M[91]+M[17]*
M[41]+M[17]*M[92]+M[18]*M[42]+M[18]*M[93]+M[19]*M[43]+M[19]*M[94]+M[20]*M[4
```

4]+M[20]*M[95]+M[21]*M[45]+M[21]*M[96]+M[22]*M[46]+M[22]*M[97]+M[23]*M[47]+
M[23]*M[98]+M[24]*M[48]+M[24]*M[99]+M[25]*M[49]+M[26]*M[50]+M[27]*M[51]+M[2
8]*M[52]+M[29]*M[53]+M[30]*M[54]+M[31]*M[55]+M[32]*M[56]+M[33]*M[57]+M[34]*
M[58]+M[35]*M[59]+M[36]*M[60]+M[37]*M[61]+M[38]*M[62]+M[39]*M[63]+M[40]*M[6
4]+M[41]*M[65]+M[42]*M[66]+M[43]*M[67]+M[44]*M[68]+M[45]*M[69]+M[46]*M[70]+
M[47]*M[71]+M[48]*M[72]+M[49]*M[73]+M[50]*M[74]+M[51]*M[75]+M[52]*M[76]+M[5
3]*M[77]+M[54]*M[78]+M[55]*M[79]+M[56]*M[80]+M[57]*M[81]+M[58]*M[82]+M[59]*
M[83]+M[60]*M[84]+M[61]*M[85]+M[62]*M[86]+M[63]*M[87]+M[64]*M[88]+M[65]*M[8
9]+M[66]*M[90]+M[67]*M[91]+M[68]*M[92]+M[69]*M[93]+M[70]*M[94]+M[71]*M[95]+
M[72]*M[96]+M[73]*M[97]+M[74]*M[98]+M[75]*M[99]+M[100]*M[124]+M[100]*M[175]
+M[101]*M[125]+M[101]*M[176]+M[102]*M[126]+M[102]*M[177]+M[103]*M[127]+M[10
3]*M[178]+M[104]*M[128]+M[104]*M[179]+M[105]*M[129]+M[105]*M[180]+M[106]*M[1
30]+M[106]*M[181]+M[107]*M[131]+M[107]*M[182]+M[108]*M[132]+M[108]*M[183]+M[
109]*M[133]+M[109]*M[184]+M[110]*M[134]+M[110]*M[185]+M[111]*M[135]+M[111]*M
[186]+M[112]*M[136]+M[112]*M[187]+M[113]*M[137]+M[113]*M[188]+M[114]*M[138]+
M[114]*M[189]+M[115]*M[139]+M[115]*M[190]+M[116]*M[140]+M[116]*M[191]+M[117]
*M[141]+M[117]*M[192]+M[118]*M[142]+M[118]*M[193]+M[119]*M[143]+M[119]*M[194
]+M[120]*M[144]+M[120]*M[195]+M[121]*M[145]+M[121]*M[196]+M[122]*M[146]+M[12
2]*M[197]+M[123]*M[147]+M[123]*M[198]+M[124]*M[148]+M[125]*M[149]+M[126]*M[1
50]+M[127]*M[151]+M[128]*M[152]+M[129]*M[153]+M[130]*M[154]+M[131]*M[155]+M[
132]*M[156]+M[133]*M[157]+M[134]*M[158]+M[135]*M[159]+M[136]*M[160]+M[137]*
M[161]+M[138]*M[162]+M[139]*M[163]+M[140]*M[164]+M[141]*M[165]+M[142]*M[166]
+M[143]*M[167]+M[144]*M[168]+M[145]*M[169]+M[146]*M[170]+M[147]*M[171]+M[14

```
8]*M[172]+M[149]*M[173]+M[150]*M[174]+M[151]*M[175]+M[152]*M[176]+M[153]*M[1
77]+M[154]*M[178]+M[155]*M[179]+M[156]*M[180]+M[157]*M[181]+M[158]*M[182]+M[
159]*M[183]+M[160]*M[184]+M[161]*M[185]+M[162]*M[186]+M[163]*M[187]+M[164]*
M[188]+M[165]*M[189]+M[166]*M[190]+M[167]*M[191]+M[168]*M[192]+M[169]*M[193]
+M[170]*M[194]+M[171]*M[195]+M[172]*M[196]+M[173]*M[197]+M[174]*M[198]+2);

  of = of +
abs(M[1]*M[26]+M[1]*M[75]+M[2]*M[27]+M[2]*M[76]+M[3]*M[28]+M[3]*M[77]+M[4]*
M[29]+M[4]*M[78]+M[5]*M[30]+M[5]*M[79]+M[6]*M[31]+M[6]*M[80]+M[7]*M[32]+M[7
]*M[81]+M[8]*M[33]+M[8]*M[82]+M[9]*M[34]+M[9]*M[83]+M[10]*M[35]+M[10]*M[84]+
M[11]*M[36]+M[11]*M[85]+M[12]*M[37]+M[12]*M[86]+M[13]*M[38]+M[13]*M[87]+M[1
4]*M[39]+M[14]*M[88]+M[15]*M[40]+M[15]*M[89]+M[16]*M[41]+M[16]*M[90]+M[17]*
M[42]+M[17]*M[91]+M[18]*M[43]+M[18]*M[92]+M[19]*M[44]+M[19]*M[93]+M[20]*M[4
5]+M[20]*M[94]+M[21]*M[46]+M[21]*M[95]+M[22]*M[47]+M[22]*M[96]+M[23]*M[48]+
M[23]*M[97]+M[24]*M[49]+M[24]*M[98]+M[25]*M[50]+M[25]*M[99]+M[26]*M[51]+M[2
7]*M[52]+M[28]*M[53]+M[29]*M[54]+M[30]*M[55]+M[31]*M[56]+M[32]*M[57]+M[33]*
M[58]+M[34]*M[59]+M[35]*M[60]+M[36]*M[61]+M[37]*M[62]+M[38]*M[63]+M[39]*M[6
4]+M[40]*M[65]+M[41]*M[66]+M[42]*M[67]+M[43]*M[68]+M[44]*M[69]+M[45]*M[70]+
M[46]*M[71]+M[47]*M[72]+M[48]*M[73]+M[49]*M[74]+M[50]*M[75]+M[51]*M[76]+M[5
2]*M[77]+M[53]*M[78]+M[54]*M[79]+M[55]*M[80]+M[56]*M[81]+M[57]*M[82]+M[58]*
M[83]+M[59]*M[84]+M[60]*M[85]+M[61]*M[86]+M[62]*M[87]+M[63]*M[88]+M[64]*M[8
9]+M[65]*M[90]+M[66]*M[91]+M[67]*M[92]+M[68]*M[93]+M[69]*M[94]+M[70]*M[95]+
M[71]*M[96]+M[72]*M[97]+M[73]*M[98]+M[74]*M[99]+M[100]*M[125]+M[100]*M[174]
```

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+M[101]*M[126]+M[101]*M[175]+M[102]*M[127]+M[102]*M[176]+M[103]*M[128]+M[10
3]*M[177]+M[104]*M[129]+M[104]*M[178]+M[105]*M[130]+M[105]*M[179]+M[106]*M[1
31]+M[106]*M[180]+M[107]*M[132]+M[107]*M[181]+M[108]*M[133]+M[108]*M[182]+M[
109]*M[134]+M[109]*M[183]+M[110]*M[135]+M[110]*M[184]+M[111]*M[136]+M[111]*M
[185]+M[112]*M[137]+M[112]*M[186]+M[113]*M[138]+M[113]*M[187]+M[114]*M[139]+
M[114]*M[188]+M[115]*M[140]+M[115]*M[189]+M[116]*M[141]+M[116]*M[190]+M[117]
*M[142]+M[117]*M[191]+M[118]*M[143]+M[118]*M[192]+M[119]*M[144]+M[119]*M[193
]+M[120]*M[145]+M[120]*M[194]+M[121]*M[146]+M[121]*M[195]+M[122]*M[147]+M[12
2]*M[196]+M[123]*M[148]+M[123]*M[197]+M[124]*M[149]+M[124]*M[198]+M[125]*M[1
50]+M[126]*M[151]+M[127]*M[152]+M[128]*M[153]+M[129]*M[154]+M[130]*M[155]+M[
131]*M[156]+M[132]*M[157]+M[133]*M[158]+M[134]*M[159]+M[135]*M[160]+M[136]*
M[161]+M[137]*M[162]+M[138]*M[163]+M[139]*M[164]+M[140]*M[165]+M[141]*M[166]
+M[142]*M[167]+M[143]*M[168]+M[144]*M[169]+M[145]*M[170]+M[146]*M[171]+M[14
7]*M[172]+M[148]*M[173]+M[149]*M[174]+M[150]*M[175]+M[151]*M[176]+M[152]*M[1
77]+M[153]*M[178]+M[154]*M[179]+M[155]*M[180]+M[156]*M[181]+M[157]*M[182]+M[
158]*M[183]+M[159]*M[184]+M[160]*M[185]+M[161]*M[186]+M[162]*M[187]+M[163]*
M[188]+M[164]*M[189]+M[165]*M[190]+M[166]*M[191]+M[167]*M[192]+M[168]*M[193]
+M[169]*M[194]+M[170]*M[195]+M[171]*M[196]+M[172]*M[197]+M[173]*M[198]+2);

  of = of +
abs(M[1]*M[24]+M[1]*M[77]+M[2]*M[25]+M[2]*M[78]+M[3]*M[26]+M[3]*M[79]+M[4]*
M[27]+M[4]*M[80]+M[5]*M[28]+M[5]*M[81]+M[6]*M[29]+M[6]*M[82]+M[7]*M[30]+M[7
]*M[83]+M[8]*M[31]+M[8]*M[84]+M[9]*M[32]+M[9]*M[85]+M[10]*M[33]+M[10]*M[86]+
M[11]*M[34]+M[11]*M[87]+M[12]*M[35]+M[12]*M[88]+M[13]*M[36]+M[13]*M[89]+M[1
4]*M[37]+M[14]*M[90]+M[15]*M[38]+M[15]*M[91]+M[16]*M[39]+M[16]*M[92]+M[17]*
M[40]+M[17]*M[93]+M[18]*M[41]+M[18]*M[94]+M[19]*M[42]+M[19]*M[95]+M[20]*M[4
3]+M[20]*M[96]+M[21]*M[44]+M[21]*M[97]+M[22]*M[45]+M[22]*M[98]+M[23]*M[46]+
M[23]*M[99]+M[24]*M[47]+M[25]*M[48]+M[26]*M[49]+M[27]*M[50]+M[28]*M[51]+M[2
9]*M[52]+M[30]*M[53]+M[31]*M[54]+M[32]*M[55]+M[33]*M[56]+M[34]*M[57]+M[35]*
M[58]+M[36]*M[59]+M[37]*M[60]+M[38]*M[61]+M[39]*M[62]+M[40]*M[63]+M[41]*M[6
4]+M[42]*M[65]+M[43]*M[66]+M[44]*M[67]+M[45]*M[68]+M[46]*M[69]+M[47]*M[70]+
M[48]*M[71]+M[49]*M[72]+M[50]*M[73]+M[51]*M[74]+M[52]*M[75]+M[53]*M[76]+M[5
4]*M[77]+M[55]*M[78]+M[56]*M[79]+M[57]*M[80]+M[58]*M[81]+M[59]*M[82]+M[60]*
M[83]+M[61]*M[84]+M[62]*M[85]+M[63]*M[86]+M[64]*M[87]+M[65]*M[88]+M[66]*M[8
9]+M[67]*M[90]+M[68]*M[91]+M[69]*M[92]+M[70]*M[93]+M[71]*M[94]+M[72]*M[95]+
M[73]*M[96]+M[74]*M[97]+M[75]*M[98]+M[76]*M[99]+M[100]*M[123]+M[100]*M[176]
+M[101]*M[124]+M[101]*M[177]+M[102]*M[125]+M[102]*M[178]+M[103]*M[126]+M[10
3]*M[179]+M[104]*M[127]+M[104]*M[180]+M[105]*M[128]+M[105]*M[181]+M[106]*M[1
29]+M[106]*M[182]+M[107]*M[130]+M[107]*M[183]+M[108]*M[131]+M[108]*M[184]+M[
109]*M[132]+M[109]*M[185]+M[110]*M[133]+M[110]*M[186]+M[111]*M[134]+M[111]*M
[187]+M[112]*M[135]+M[112]*M[188]+M[113]*M[136]+M[113]*M[189]+M[114]*M[137]+
M[114]*M[190]+M[115]*M[138]+M[115]*M[191]+M[116]*M[139]+M[116]*M[192]+M[117]
*M[140]+M[117]*M[193]+M[118]*M[141]+M[118]*M[194]+M[119]*M[142]+M[119]*M[195
]+M[120]*M[143]+M[120]*M[196]+M[121]*M[144]+M[121]*M[197]+M[122]*M[145]+M[12
2]*M[198]+M[123]*M[146]+M[124]*M[147]+M[125]*M[148]+M[126]*M[149]+M[127]*M[1
50]+M[128]*M[151]+M[129]*M[152]+M[130]*M[153]+M[131]*M[154]+M[132]*M[155]+M[
133]*M[156]+M[134]*M[157]+M[135]*M[158]+M[136]*M[159]+M[137]*M[160]+M[138]*
M[161]+M[139]*M[162]+M[140]*M[163]+M[141]*M[164]+M[142]*M[165]+M[143]*M[166]
+M[144]*M[167]+M[145]*M[168]+M[146]*M[169]+M[147]*M[170]+M[148]*M[171]+M[14
9]*M[172]+M[150]*M[173]+M[151]*M[174]+M[152]*M[175]+M[153]*M[176]+M[154]*M[1
77]+M[155]*M[178]+M[156]*M[179]+M[157]*M[180]+M[158]*M[181]+M[159]*M[182]+M[
160]*M[183]+M[161]*M[184]+M[162]*M[185]+M[163]*M[186]+M[164]*M[187]+M[165]*
M[188]+M[166]*M[189]+M[167]*M[190]+M[168]*M[191]+M[169]*M[192]+M[170]*M[193]
+M[171]*M[194]+M[172]*M[195]+M[173]*M[196]+M[174]*M[197]+M[175]*M[198]+2);

   of = of +
abs(M[1]*M[20]+M[1]*M[81]+M[2]*M[21]+M[2]*M[82]+M[3]*M[22]+M[3]*M[83]+M[4]*
M[23]+M[4]*M[84]+M[5]*M[24]+M[5]*M[85]+M[6]*M[25]+M[6]*M[86]+M[7]*M[26]+M[7
]*M[87]+M[8]*M[27]+M[8]*M[88]+M[9]*M[28]+M[9]*M[89]+M[10]*M[29]+M[10]*M[90]+
M[11]*M[30]+M[11]*M[91]+M[12]*M[31]+M[12]*M[92]+M[13]*M[32]+M[13]*M[93]+M[1
4]*M[33]+M[14]*M[94]+M[15]*M[34]+M[15]*M[95]+M[16]*M[35]+M[16]*M[96]+M[17]*
M[36]+M[17]*M[97]+M[18]*M[37]+M[18]*M[98]+M[19]*M[38]+M[19]*M[99]+M[20]*M[3
9]+M[21]*M[40]+M[22]*M[41]+M[23]*M[42]+M[24]*M[43]+M[25]*M[44]+M[26]*M[45]+
M[27]*M[46]+M[28]*M[47]+M[29]*M[48]+M[30]*M[49]+M[31]*M[50]+M[32]*M[51]+M[3
3]*M[52]+M[34]*M[53]+M[35]*M[54]+M[36]*M[55]+M[37]*M[56]+M[38]*M[57]+M[39]*
M[58]+M[40]*M[59]+M[41]*M[60]+M[42]*M[61]+M[43]*M[62]+M[44]*M[63]+M[45]*M[6
4]+M[46]*M[65]+M[47]*M[66]+M[48]*M[67]+M[49]*M[68]+M[50]*M[69]+M[51]*M[70]+
M[52]*M[71]+M[53]*M[72]+M[54]*M[73]+M[55]*M[74]+M[56]*M[75]+M[57]*M[76]+M[5
8]*M[77]+M[59]*M[78]+M[60]*M[79]+M[61]*M[80]+M[62]*M[81]+M[63]*M[82]+M[64]*
```

```
M[83]+M[65]*M[84]+M[66]*M[85]+M[67]*M[86]+M[68]*M[87]+M[69]*M[88]+M[70]*M[8
9]+M[71]*M[90]+M[72]*M[91]+M[73]*M[92]+M[74]*M[93]+M[75]*M[94]+M[76]*M[95]+
M[77]*M[96]+M[78]*M[97]+M[79]*M[98]+M[80]*M[99]+M[100]*M[119]+M[100]*M[180]
+M[101]*M[120]+M[101]*M[181]+M[102]*M[121]+M[102]*M[182]+M[103]*M[122]+M[10
3]*M[183]+M[104]*M[123]+M[104]*M[184]+M[105]*M[124]+M[105]*M[185]+M[106]*M[1
25]+M[106]*M[186]+M[107]*M[126]+M[107]*M[187]+M[108]*M[127]+M[108]*M[188]+M[
109]*M[128]+M[109]*M[189]+M[110]*M[129]+M[110]*M[190]+M[111]*M[130]+M[111]*M
[191]+M[112]*M[131]+M[112]*M[192]+M[113]*M[132]+M[113]*M[193]+M[114]*M[133]+
M[114]*M[194]+M[115]*M[134]+M[115]*M[195]+M[116]*M[135]+M[116]*M[196]+M[117]
*M[136]+M[117]*M[197]+M[118]*M[137]+M[118]*M[198]+M[119]*M[138]+M[120]*M[139
]+M[121]*M[140]+M[122]*M[141]+M[123]*M[142]+M[124]*M[143]+M[125]*M[144]+M[12
6]*M[145]+M[127]*M[146]+M[128]*M[147]+M[129]*M[148]+M[130]*M[149]+M[131]*M[1
50]+M[132]*M[151]+M[133]*M[152]+M[134]*M[153]+M[135]*M[154]+M[136]*M[155]+M[
137]*M[156]+M[138]*M[157]+M[139]*M[158]+M[140]*M[159]+M[141]*M[160]+M[142]*
M[161]+M[143]*M[162]+M[144]*M[163]+M[145]*M[164]+M[146]*M[165]+M[147]*M[166]
+M[148]*M[167]+M[149]*M[168]+M[150]*M[169]+M[151]*M[170]+M[152]*M[171]+M[15
3]*M[172]+M[154]*M[173]+M[155]*M[174]+M[156]*M[175]+M[157]*M[176]+M[158]*M[1
77]+M[159]*M[178]+M[160]*M[179]+M[161]*M[180]+M[162]*M[181]+M[163]*M[182]+M[
164]*M[183]+M[165]*M[184]+M[166]*M[185]+M[167]*M[186]+M[168]*M[187]+M[169]*
M[188]+M[170]*M[189]+M[171]*M[190]+M[172]*M[191]+M[173]*M[192]+M[174]*M[193]
+M[175]*M[194]+M[176]*M[195]+M[177]*M[196]+M[178]*M[197]+M[179]*M[198]+2);
```

```
  of = of +
abs(M[1]*M[21]+M[1]*M[80]+M[2]*M[22]+M[2]*M[81]+M[3]*M[23]+M[3]*M[82]+M[4]*
M[24]+M[4]*M[83]+M[5]*M[25]+M[5]*M[84]+M[6]*M[26]+M[6]*M[85]+M[7]*M[27]+M[7
]*M[86]+M[8]*M[28]+M[8]*M[87]+M[9]*M[29]+M[9]*M[88]+M[10]*M[30]+M[10]*M[89]+
M[11]*M[31]+M[11]*M[90]+M[12]*M[32]+M[12]*M[91]+M[13]*M[33]+M[13]*M[92]+M[1
4]*M[34]+M[14]*M[93]+M[15]*M[35]+M[15]*M[94]+M[16]*M[36]+M[16]*M[95]+M[17]*
M[37]+M[17]*M[96]+M[18]*M[38]+M[18]*M[97]+M[19]*M[39]+M[19]*M[98]+M[20]*M[4
0]+M[20]*M[99]+M[21]*M[41]+M[22]*M[42]+M[23]*M[43]+M[24]*M[44]+M[25]*M[45]+
M[26]*M[46]+M[27]*M[47]+M[28]*M[48]+M[29]*M[49]+M[30]*M[50]+M[31]*M[51]+M[3
2]*M[52]+M[33]*M[53]+M[34]*M[54]+M[35]*M[55]+M[36]*M[56]+M[37]*M[57]+M[38]*
M[58]+M[39]*M[59]+M[40]*M[60]+M[41]*M[61]+M[42]*M[62]+M[43]*M[63]+M[44]*M[6
4]+M[45]*M[65]+M[46]*M[66]+M[47]*M[67]+M[48]*M[68]+M[49]*M[69]+M[50]*M[70]+
M[51]*M[71]+M[52]*M[72]+M[53]*M[73]+M[54]*M[74]+M[55]*M[75]+M[56]*M[76]+M[5
7]*M[77]+M[58]*M[78]+M[59]*M[79]+M[60]*M[80]+M[61]*M[81]+M[62]*M[82]+M[63]*
M[83]+M[64]*M[84]+M[65]*M[85]+M[66]*M[86]+M[67]*M[87]+M[68]*M[88]+M[69]*M[8
9]+M[70]*M[90]+M[71]*M[91]+M[72]*M[92]+M[73]*M[93]+M[74]*M[94]+M[75]*M[95]+
M[76]*M[96]+M[77]*M[97]+M[78]*M[98]+M[79]*M[99]+M[100]*M[120]+M[100]*M[179]
+M[101]*M[121]+M[101]*M[180]+M[102]*M[122]+M[102]*M[181]+M[103]*M[123]+M[10
3]*M[182]+M[104]*M[124]+M[104]*M[183]+M[105]*M[125]+M[105]*M[184]+M[106]*M[1
26]+M[106]*M[185]+M[107]*M[127]+M[107]*M[186]+M[108]*M[128]+M[108]*M[187]+M[
109]*M[129]+M[109]*M[188]+M[110]*M[130]+M[110]*M[189]+M[111]*M[131]+M[111]*M
[190]+M[112]*M[132]+M[112]*M[191]+M[113]*M[133]+M[113]*M[192]+M[114]*M[134]+
M[114]*M[193]+M[115]*M[135]+M[115]*M[194]+M[116]*M[136]+M[116]*M[195]+M[117]
```

```
*M[137]+M[117]*M[196]+M[118]*M[138]+M[118]*M[197]+M[119]*M[139]+M[119]*M[198
]+M[120]*M[140]+M[121]*M[141]+M[122]*M[142]+M[123]*M[143]+M[124]*M[144]+M[12
5]*M[145]+M[126]*M[146]+M[127]*M[147]+M[128]*M[148]+M[129]*M[149]+M[130]*M[1
50]+M[131]*M[151]+M[132]*M[152]+M[133]*M[153]+M[134]*M[154]+M[135]*M[155]+M[
136]*M[156]+M[137]*M[157]+M[138]*M[158]+M[139]*M[159]+M[140]*M[160]+M[141]*
M[161]+M[142]*M[162]+M[143]*M[163]+M[144]*M[164]+M[145]*M[165]+M[146]*M[166]
+M[147]*M[167]+M[148]*M[168]+M[149]*M[169]+M[150]*M[170]+M[151]*M[171]+M[15
2]*M[172]+M[153]*M[173]+M[154]*M[174]+M[155]*M[175]+M[156]*M[176]+M[157]*M[1
77]+M[158]*M[178]+M[159]*M[179]+M[160]*M[180]+M[161]*M[181]+M[162]*M[182]+M[
163]*M[183]+M[164]*M[184]+M[165]*M[185]+M[166]*M[186]+M[167]*M[187]+M[168]*
M[188]+M[169]*M[189]+M[170]*M[190]+M[171]*M[191]+M[172]*M[192]+M[173]*M[193]
+M[174]*M[194]+M[175]*M[195]+M[176]*M[196]+M[177]*M[197]+M[178]*M[198]+2);

  of = of +
abs(M[1]*M[22]+M[1]*M[79]+M[2]*M[23]+M[2]*M[80]+M[3]*M[24]+M[3]*M[81]+M[4]*
M[25]+M[4]*M[82]+M[5]*M[26]+M[5]*M[83]+M[6]*M[27]+M[6]*M[84]+M[7]*M[28]+M[7
]*M[85]+M[8]*M[29]+M[8]*M[86]+M[9]*M[30]+M[9]*M[87]+M[10]*M[31]+M[10]*M[88]+
M[11]*M[32]+M[11]*M[89]+M[12]*M[33]+M[12]*M[90]+M[13]*M[34]+M[13]*M[91]+M[1
4]*M[35]+M[14]*M[92]+M[15]*M[36]+M[15]*M[93]+M[16]*M[37]+M[16]*M[94]+M[17]*
M[38]+M[17]*M[95]+M[18]*M[39]+M[18]*M[96]+M[19]*M[40]+M[19]*M[97]+M[20]*M[4
1]+M[20]*M[98]+M[21]*M[42]+M[21]*M[99]+M[22]*M[43]+M[23]*M[44]+M[24]*M[45]+
M[25]*M[46]+M[26]*M[47]+M[27]*M[48]+M[28]*M[49]+M[29]*M[50]+M[30]*M[51]+M[3
1]*M[52]+M[32]*M[53]+M[33]*M[54]+M[34]*M[55]+M[35]*M[56]+M[36]*M[57]+M[37]*
```

```
M[58]+M[38]*M[59]+M[39]*M[60]+M[40]*M[61]+M[41]*M[62]+M[42]*M[63]+M[43]*M[6
4]+M[44]*M[65]+M[45]*M[66]+M[46]*M[67]+M[47]*M[68]+M[48]*M[69]+M[49]*M[70]+
M[50]*M[71]+M[51]*M[72]+M[52]*M[73]+M[53]*M[74]+M[54]*M[75]+M[55]*M[76]+M[5
6]*M[77]+M[57]*M[78]+M[58]*M[79]+M[59]*M[80]+M[60]*M[81]+M[61]*M[82]+M[62]*
M[83]+M[63]*M[84]+M[64]*M[85]+M[65]*M[86]+M[66]*M[87]+M[67]*M[88]+M[68]*M[8
9]+M[69]*M[90]+M[70]*M[91]+M[71]*M[92]+M[72]*M[93]+M[73]*M[94]+M[74]*M[95]+
M[75]*M[96]+M[76]*M[97]+M[77]*M[98]+M[78]*M[99]+M[100]*M[121]+M[100]*M[178]
+M[101]*M[122]+M[101]*M[179]+M[102]*M[123]+M[102]*M[180]+M[103]*M[124]+M[10
3]*M[181]+M[104]*M[125]+M[104]*M[182]+M[105]*M[126]+M[105]*M[183]+M[106]*M[1
27]+M[106]*M[184]+M[107]*M[128]+M[107]*M[185]+M[108]*M[129]+M[108]*M[186]+M[
109]*M[130]+M[109]*M[187]+M[110]*M[131]+M[110]*M[188]+M[111]*M[132]+M[111]*M
[189]+M[112]*M[133]+M[112]*M[190]+M[113]*M[134]+M[113]*M[191]+M[114]*M[135]+
M[114]*M[192]+M[115]*M[136]+M[115]*M[193]+M[116]*M[137]+M[116]*M[194]+M[117]
*M[138]+M[117]*M[195]+M[118]*M[139]+M[118]*M[196]+M[119]*M[140]+M[119]*M[197
]+M[120]*M[141]+M[120]*M[198]+M[121]*M[142]+M[122]*M[143]+M[123]*M[144]+M[12
4]*M[145]+M[125]*M[146]+M[126]*M[147]+M[127]*M[148]+M[128]*M[149]+M[129]*M[1
50]+M[130]*M[151]+M[131]*M[152]+M[132]*M[153]+M[133]*M[154]+M[134]*M[155]+M[
135]*M[156]+M[136]*M[157]+M[137]*M[158]+M[138]*M[159]+M[139]*M[160]+M[140]*
M[161]+M[141]*M[162]+M[142]*M[163]+M[143]*M[164]+M[144]*M[165]+M[145]*M[166]
+M[146]*M[167]+M[147]*M[168]+M[148]*M[169]+M[149]*M[170]+M[150]*M[171]+M[15
1]*M[172]+M[152]*M[173]+M[153]*M[174]+M[154]*M[175]+M[155]*M[176]+M[156]*M[1
77]+M[157]*M[178]+M[158]*M[179]+M[159]*M[180]+M[160]*M[181]+M[161]*M[182]+M[
162]*M[183]+M[163]*M[184]+M[164]*M[185]+M[165]*M[186]+M[166]*M[187]+M[167]*
```

```
M[188]+M[168]*M[189]+M[169]*M[190]+M[170]*M[191]+M[171]*M[192]+M[172]*M[193]
+M[173]*M[194]+M[174]*M[195]+M[175]*M[196]+M[176]*M[197]+M[177]*M[198]+2);

   of = of +
abs(M[1]*M[23]+M[1]*M[78]+M[2]*M[24]+M[2]*M[79]+M[3]*M[25]+M[3]*M[80]+M[4]*
M[26]+M[4]*M[81]+M[5]*M[27]+M[5]*M[82]+M[6]*M[28]+M[6]*M[83]+M[7]*M[29]+M[7
]*M[84]+M[8]*M[30]+M[8]*M[85]+M[9]*M[31]+M[9]*M[86]+M[10]*M[32]+M[10]*M[87]+
M[11]*M[33]+M[11]*M[88]+M[12]*M[34]+M[12]*M[89]+M[13]*M[35]+M[13]*M[90]+M[1
4]*M[36]+M[14]*M[91]+M[15]*M[37]+M[15]*M[92]+M[16]*M[38]+M[16]*M[93]+M[17]*
M[39]+M[17]*M[94]+M[18]*M[40]+M[18]*M[95]+M[19]*M[41]+M[19]*M[96]+M[20]*M[4
2]+M[20]*M[97]+M[21]*M[43]+M[21]*M[98]+M[22]*M[44]+M[22]*M[99]+M[23]*M[45]+
M[24]*M[46]+M[25]*M[47]+M[26]*M[48]+M[27]*M[49]+M[28]*M[50]+M[29]*M[51]+M[3
0]*M[52]+M[31]*M[53]+M[32]*M[54]+M[33]*M[55]+M[34]*M[56]+M[35]*M[57]+M[36]*
M[58]+M[37]*M[59]+M[38]*M[60]+M[39]*M[61]+M[40]*M[62]+M[41]*M[63]+M[42]*M[6
4]+M[43]*M[65]+M[44]*M[66]+M[45]*M[67]+M[46]*M[68]+M[47]*M[69]+M[48]*M[70]+
M[49]*M[71]+M[50]*M[72]+M[51]*M[73]+M[52]*M[74]+M[53]*M[75]+M[54]*M[76]+M[5
5]*M[77]+M[56]*M[78]+M[57]*M[79]+M[58]*M[80]+M[59]*M[81]+M[60]*M[82]+M[61]*
M[83]+M[62]*M[84]+M[63]*M[85]+M[64]*M[86]+M[65]*M[87]+M[66]*M[88]+M[67]*M[8
9]+M[68]*M[90]+M[69]*M[91]+M[70]*M[92]+M[71]*M[93]+M[72]*M[94]+M[73]*M[95]+
M[74]*M[96]+M[75]*M[97]+M[76]*M[98]+M[77]*M[99]+M[100]*M[122]+M[100]*M[177]
+M[101]*M[123]+M[101]*M[178]+M[102]*M[124]+M[102]*M[179]+M[103]*M[125]+M[10
3]*M[180]+M[104]*M[126]+M[104]*M[181]+M[105]*M[127]+M[105]*M[182]+M[106]*M[1
28]+M[106]*M[183]+M[107]*M[129]+M[107]*M[184]+M[108]*M[130]+M[108]*M[185]+M[
109]*M[131]+M[109]*M[186]+M[110]*M[132]+M[110]*M[187]+M[111]*M[133]+M[111]*M
[188]+M[112]*M[134]+M[112]*M[189]+M[113]*M[135]+M[113]*M[190]+M[114]*M[136]+
M[114]*M[191]+M[115]*M[137]+M[115]*M[192]+M[116]*M[138]+M[116]*M[193]+M[117]
*M[139]+M[117]*M[194]+M[118]*M[140]+M[118]*M[195]+M[119]*M[141]+M[119]*M[196
]+M[120]*M[142]+M[120]*M[197]+M[121]*M[143]+M[121]*M[198]+M[122]*M[144]+M[12
3]*M[145]+M[124]*M[146]+M[125]*M[147]+M[126]*M[148]+M[127]*M[149]+M[128]*M[1
50]+M[129]*M[151]+M[130]*M[152]+M[131]*M[153]+M[132]*M[154]+M[133]*M[155]+M[
134]*M[156]+M[135]*M[157]+M[136]*M[158]+M[137]*M[159]+M[138]*M[160]+M[139]*
M[161]+M[140]*M[162]+M[141]*M[163]+M[142]*M[164]+M[143]*M[165]+M[144]*M[166]
+M[145]*M[167]+M[146]*M[168]+M[147]*M[169]+M[148]*M[170]+M[149]*M[171]+M[15
0]*M[172]+M[151]*M[173]+M[152]*M[174]+M[153]*M[175]+M[154]*M[176]+M[155]*M[1
77]+M[156]*M[178]+M[157]*M[179]+M[158]*M[180]+M[159]*M[181]+M[160]*M[182]+M[
161]*M[183]+M[162]*M[184]+M[163]*M[185]+M[164]*M[186]+M[165]*M[187]+M[166]*
M[188]+M[167]*M[189]+M[168]*M[190]+M[169]*M[191]+M[170]*M[192]+M[171]*M[193]
+M[172]*M[194]+M[173]*M[195]+M[174]*M[196]+M[175]*M[197]+M[176]*M[198]+2);

  of = of +
abs(M[1]*M[17]+M[1]*M[84]+M[2]*M[18]+M[2]*M[85]+M[3]*M[19]+M[3]*M[86]+M[4]*
M[20]+M[4]*M[87]+M[5]*M[21]+M[5]*M[88]+M[6]*M[22]+M[6]*M[89]+M[7]*M[23]+M[7
]*M[90]+M[8]*M[24]+M[8]*M[91]+M[9]*M[25]+M[9]*M[92]+M[10]*M[26]+M[10]*M[93]+
M[11]*M[27]+M[11]*M[94]+M[12]*M[28]+M[12]*M[95]+M[13]*M[29]+M[13]*M[96]+M[1
4]*M[30]+M[14]*M[97]+M[15]*M[31]+M[15]*M[98]+M[16]*M[32]+M[16]*M[99]+M[17]*
M[33]+M[18]*M[34]+M[19]*M[35]+M[20]*M[36]+M[21]*M[37]+M[22]*M[38]+M[23]*M[3
```

```
9]+M[24]*M[40]+M[25]*M[41]+M[26]*M[42]+M[27]*M[43]+M[28]*M[44]+M[29]*M[45]+
M[30]*M[46]+M[31]*M[47]+M[32]*M[48]+M[33]*M[49]+M[34]*M[50]+M[35]*M[51]+M[3
6]*M[52]+M[37]*M[53]+M[38]*M[54]+M[39]*M[55]+M[40]*M[56]+M[41]*M[57]+M[42]*
M[58]+M[43]*M[59]+M[44]*M[60]+M[45]*M[61]+M[46]*M[62]+M[47]*M[63]+M[48]*M[6
4]+M[49]*M[65]+M[50]*M[66]+M[51]*M[67]+M[52]*M[68]+M[53]*M[69]+M[54]*M[70]+
M[55]*M[71]+M[56]*M[72]+M[57]*M[73]+M[58]*M[74]+M[59]*M[75]+M[60]*M[76]+M[6
1]*M[77]+M[62]*M[78]+M[63]*M[79]+M[64]*M[80]+M[65]*M[81]+M[66]*M[82]+M[67]*
M[83]+M[68]*M[84]+M[69]*M[85]+M[70]*M[86]+M[71]*M[87]+M[72]*M[88]+M[73]*M[8
9]+M[74]*M[90]+M[75]*M[91]+M[76]*M[92]+M[77]*M[93]+M[78]*M[94]+M[79]*M[95]+
M[80]*M[96]+M[81]*M[97]+M[82]*M[98]+M[83]*M[99]+M[100]*M[116]+M[100]*M[183]
+M[101]*M[117]+M[101]*M[184]+M[102]*M[118]+M[102]*M[185]+M[103]*M[119]+M[10
3]*M[186]+M[104]*M[120]+M[104]*M[187]+M[105]*M[121]+M[105]*M[188]+M[106]*M[1
22]+M[106]*M[189]+M[107]*M[123]+M[107]*M[190]+M[108]*M[124]+M[108]*M[191]+M[
109]*M[125]+M[109]*M[192]+M[110]*M[126]+M[110]*M[193]+M[111]*M[127]+M[111]*M
[194]+M[112]*M[128]+M[112]*M[195]+M[113]*M[129]+M[113]*M[196]+M[114]*M[130]+
M[114]*M[197]+M[115]*M[131]+M[115]*M[198]+M[116]*M[132]+M[117]*M[133]+M[118]
*M[134]+M[119]*M[135]+M[120]*M[136]+M[121]*M[137]+M[122]*M[138]+M[123]*M[13
9]+M[124]*M[140]+M[125]*M[141]+M[126]*M[142]+M[127]*M[143]+M[128]*M[144]+M[1
29]*M[145]+M[130]*M[146]+M[131]*M[147]+M[132]*M[148]+M[133]*M[149]+M[134]*M[
150]+M[135]*M[151]+M[136]*M[152]+M[137]*M[153]+M[138]*M[154]+M[139]*M[155]+
M[140]*M[156]+M[141]*M[157]+M[142]*M[158]+M[143]*M[159]+M[144]*M[160]+M[145]
*M[161]+M[146]*M[162]+M[147]*M[163]+M[148]*M[164]+M[149]*M[165]+M[150]*M[16
6]+M[151]*M[167]+M[152]*M[168]+M[153]*M[169]+M[154]*M[170]+M[155]*M[171]+M[1
```

```
56]*M[172]+M[157]*M[173]+M[158]*M[174]+M[159]*M[175]+M[160]*M[176]+M[161]*M[
177]+M[162]*M[178]+M[163]*M[179]+M[164]*M[180]+M[165]*M[181]+M[166]*M[182]+
M[167]*M[183]+M[168]*M[184]+M[169]*M[185]+M[170]*M[186]+M[171]*M[187]+M[172]
*M[188]+M[173]*M[189]+M[174]*M[190]+M[175]*M[191]+M[176]*M[192]+M[177]*M[19
3]+M[178]*M[194]+M[179]*M[195]+M[180]*M[196]+M[181]*M[197]+M[182]*M[198]+2);

  of = of +
abs(M[1]*M[18]+M[1]*M[83]+M[2]*M[19]+M[2]*M[84]+M[3]*M[20]+M[3]*M[85]+M[4]*
M[21]+M[4]*M[86]+M[5]*M[22]+M[5]*M[87]+M[6]*M[23]+M[6]*M[88]+M[7]*M[24]+M[7
]*M[89]+M[8]*M[25]+M[8]*M[90]+M[9]*M[26]+M[9]*M[91]+M[10]*M[27]+M[10]*M[92]+
M[11]*M[28]+M[11]*M[93]+M[12]*M[29]+M[12]*M[94]+M[13]*M[30]+M[13]*M[95]+M[1
4]*M[31]+M[14]*M[96]+M[15]*M[32]+M[15]*M[97]+M[16]*M[33]+M[16]*M[98]+M[17]*
M[34]+M[17]*M[99]+M[18]*M[35]+M[19]*M[36]+M[20]*M[37]+M[21]*M[38]+M[22]*M[3
9]+M[23]*M[40]+M[24]*M[41]+M[25]*M[42]+M[26]*M[43]+M[27]*M[44]+M[28]*M[45]+
M[29]*M[46]+M[30]*M[47]+M[31]*M[48]+M[32]*M[49]+M[33]*M[50]+M[34]*M[51]+M[3
5]*M[52]+M[36]*M[53]+M[37]*M[54]+M[38]*M[55]+M[39]*M[56]+M[40]*M[57]+M[41]*
M[58]+M[42]*M[59]+M[43]*M[60]+M[44]*M[61]+M[45]*M[62]+M[46]*M[63]+M[47]*M[6
4]+M[48]*M[65]+M[49]*M[66]+M[50]*M[67]+M[51]*M[68]+M[52]*M[69]+M[53]*M[70]+
M[54]*M[71]+M[55]*M[72]+M[56]*M[73]+M[57]*M[74]+M[58]*M[75]+M[59]*M[76]+M[6
0]*M[77]+M[61]*M[78]+M[62]*M[79]+M[63]*M[80]+M[64]*M[81]+M[65]*M[82]+M[66]*
M[83]+M[67]*M[84]+M[68]*M[85]+M[69]*M[86]+M[70]*M[87]+M[71]*M[88]+M[72]*M[8
9]+M[73]*M[90]+M[74]*M[91]+M[75]*M[92]+M[76]*M[93]+M[77]*M[94]+M[78]*M[95]+
M[79]*M[96]+M[80]*M[97]+M[81]*M[98]+M[82]*M[99]+M[100]*M[117]+M[100]*M[182]
```

```
+M[101]*M[118]+M[101]*M[183]+M[102]*M[119]+M[102]*M[184]+M[103]*M[120]+M[10
3]*M[185]+M[104]*M[121]+M[104]*M[186]+M[105]*M[122]+M[105]*M[187]+M[106]*M[1
23]+M[106]*M[188]+M[107]*M[124]+M[107]*M[189]+M[108]*M[125]+M[108]*M[190]+M[
109]*M[126]+M[109]*M[191]+M[110]*M[127]+M[110]*M[192]+M[111]*M[128]+M[111]*M
[193]+M[112]*M[129]+M[112]*M[194]+M[113]*M[130]+M[113]*M[195]+M[114]*M[131]+
M[114]*M[196]+M[115]*M[132]+M[115]*M[197]+M[116]*M[133]+M[116]*M[198]+M[117]
*M[134]+M[118]*M[135]+M[119]*M[136]+M[120]*M[137]+M[121]*M[138]+M[122]*M[13
9]+M[123]*M[140]+M[124]*M[141]+M[125]*M[142]+M[126]*M[143]+M[127]*M[144]+M[1
28]*M[145]+M[129]*M[146]+M[130]*M[147]+M[131]*M[148]+M[132]*M[149]+M[133]*M[
150]+M[134]*M[151]+M[135]*M[152]+M[136]*M[153]+M[137]*M[154]+M[138]*M[155]+
M[139]*M[156]+M[140]*M[157]+M[141]*M[158]+M[142]*M[159]+M[143]*M[160]+M[144]
*M[161]+M[145]*M[162]+M[146]*M[163]+M[147]*M[164]+M[148]*M[165]+M[149]*M[16
6]+M[150]*M[167]+M[151]*M[168]+M[152]*M[169]+M[153]*M[170]+M[154]*M[171]+M[1
55]*M[172]+M[156]*M[173]+M[157]*M[174]+M[158]*M[175]+M[159]*M[176]+M[160]*M[
177]+M[161]*M[178]+M[162]*M[179]+M[163]*M[180]+M[164]*M[181]+M[165]*M[182]+
M[166]*M[183]+M[167]*M[184]+M[168]*M[185]+M[169]*M[186]+M[170]*M[187]+M[171]
*M[188]+M[172]*M[189]+M[173]*M[190]+M[174]*M[191]+M[175]*M[192]+M[176]*M[19
3]+M[177]*M[194]+M[178]*M[195]+M[179]*M[196]+M[180]*M[197]+M[181]*M[198]+2);

  of = of +
abs(M[1]*M[19]+M[1]*M[82]+M[2]*M[20]+M[2]*M[83]+M[3]*M[21]+M[3]*M[84]+M[4]*
M[22]+M[4]*M[85]+M[5]*M[23]+M[5]*M[86]+M[6]*M[24]+M[6]*M[87]+M[7]*M[25]+M[7
]*M[88]+M[8]*M[26]+M[8]*M[89]+M[9]*M[27]+M[9]*M[90]+M[10]*M[28]+M[10]*M[91]+
```

M[11]*M[29]+M[11]*M[92]+M[12]*M[30]+M[12]*M[93]+M[13]*M[31]+M[13]*M[94]+M[1
4]*M[32]+M[14]*M[95]+M[15]*M[33]+M[15]*M[96]+M[16]*M[34]+M[16]*M[97]+M[17]*
M[35]+M[17]*M[98]+M[18]*M[36]+M[18]*M[99]+M[19]*M[37]+M[20]*M[38]+M[21]*M[3
9]+M[22]*M[40]+M[23]*M[41]+M[24]*M[42]+M[25]*M[43]+M[26]*M[44]+M[27]*M[45]+
M[28]*M[46]+M[29]*M[47]+M[30]*M[48]+M[31]*M[49]+M[32]*M[50]+M[33]*M[51]+M[3
4]*M[52]+M[35]*M[53]+M[36]*M[54]+M[37]*M[55]+M[38]*M[56]+M[39]*M[57]+M[40]*
M[58]+M[41]*M[59]+M[42]*M[60]+M[43]*M[61]+M[44]*M[62]+M[45]*M[63]+M[46]*M[6
4]+M[47]*M[65]+M[48]*M[66]+M[49]*M[67]+M[50]*M[68]+M[51]*M[69]+M[52]*M[70]+
M[53]*M[71]+M[54]*M[72]+M[55]*M[73]+M[56]*M[74]+M[57]*M[75]+M[58]*M[76]+M[5
9]*M[77]+M[60]*M[78]+M[61]*M[79]+M[62]*M[80]+M[63]*M[81]+M[64]*M[82]+M[65]*
M[83]+M[66]*M[84]+M[67]*M[85]+M[68]*M[86]+M[69]*M[87]+M[70]*M[88]+M[71]*M[8
9]+M[72]*M[90]+M[73]*M[91]+M[74]*M[92]+M[75]*M[93]+M[76]*M[94]+M[77]*M[95]+
M[78]*M[96]+M[79]*M[97]+M[80]*M[98]+M[81]*M[99]+M[100]*M[118]+M[100]*M[181]
+M[101]*M[119]+M[101]*M[182]+M[102]*M[120]+M[102]*M[183]+M[103]*M[121]+M[10
3]*M[184]+M[104]*M[122]+M[104]*M[185]+M[105]*M[123]+M[105]*M[186]+M[106]*M[1
24]+M[106]*M[187]+M[107]*M[125]+M[107]*M[188]+M[108]*M[126]+M[108]*M[189]+M[
109]*M[127]+M[109]*M[190]+M[110]*M[128]+M[110]*M[191]+M[111]*M[129]+M[111]*M
[192]+M[112]*M[130]+M[112]*M[193]+M[113]*M[131]+M[113]*M[194]+M[114]*M[132]+
M[114]*M[195]+M[115]*M[133]+M[115]*M[196]+M[116]*M[134]+M[116]*M[197]+M[117]
*M[135]+M[117]*M[198]+M[118]*M[136]+M[119]*M[137]+M[120]*M[138]+M[121]*M[139
]+M[122]*M[140]+M[123]*M[141]+M[124]*M[142]+M[125]*M[143]+M[126]*M[144]+M[12
7]*M[145]+M[128]*M[146]+M[129]*M[147]+M[130]*M[148]+M[131]*M[149]+M[132]*M[1
50]+M[133]*M[151]+M[134]*M[152]+M[135]*M[153]+M[136]*M[154]+M[137]*M[155]+M[

```
138]*M[156]+M[139]*M[157]+M[140]*M[158]+M[141]*M[159]+M[142]*M[160]+M[143]*
M[161]+M[144]*M[162]+M[145]*M[163]+M[146]*M[164]+M[147]*M[165]+M[148]*M[166]
+M[149]*M[167]+M[150]*M[168]+M[151]*M[169]+M[152]*M[170]+M[153]*M[171]+M[15
4]*M[172]+M[155]*M[173]+M[156]*M[174]+M[157]*M[175]+M[158]*M[176]+M[159]*M[1
77]+M[160]*M[178]+M[161]*M[179]+M[162]*M[180]+M[163]*M[181]+M[164]*M[182]+M[
165]*M[183]+M[166]*M[184]+M[167]*M[185]+M[168]*M[186]+M[169]*M[187]+M[170]*
M[188]+M[171]*M[189]+M[172]*M[190]+M[173]*M[191]+M[174]*M[192]+M[175]*M[193]
+M[176]*M[194]+M[177]*M[195]+M[178]*M[196]+M[179]*M[197]+M[180]*M[198]+2);

  of = of +
abs(M[1]*M[15]+M[1]*M[86]+M[2]*M[16]+M[2]*M[87]+M[3]*M[17]+M[3]*M[88]+M[4]*
M[18]+M[4]*M[89]+M[5]*M[19]+M[5]*M[90]+M[6]*M[20]+M[6]*M[91]+M[7]*M[21]+M[7
]*M[92]+M[8]*M[22]+M[8]*M[93]+M[9]*M[23]+M[9]*M[94]+M[10]*M[24]+M[10]*M[95]+
M[11]*M[25]+M[11]*M[96]+M[12]*M[26]+M[12]*M[97]+M[13]*M[27]+M[13]*M[98]+M[1
4]*M[28]+M[14]*M[99]+M[15]*M[29]+M[16]*M[30]+M[17]*M[31]+M[18]*M[32]+M[19]*
M[33]+M[20]*M[34]+M[21]*M[35]+M[22]*M[36]+M[23]*M[37]+M[24]*M[38]+M[25]*M[3
9]+M[26]*M[40]+M[27]*M[41]+M[28]*M[42]+M[29]*M[43]+M[30]*M[44]+M[31]*M[45]+
M[32]*M[46]+M[33]*M[47]+M[34]*M[48]+M[35]*M[49]+M[36]*M[50]+M[37]*M[51]+M[3
8]*M[52]+M[39]*M[53]+M[40]*M[54]+M[41]*M[55]+M[42]*M[56]+M[43]*M[57]+M[44]*
M[58]+M[45]*M[59]+M[46]*M[60]+M[47]*M[61]+M[48]*M[62]+M[49]*M[63]+M[50]*M[6
4]+M[51]*M[65]+M[52]*M[66]+M[53]*M[67]+M[54]*M[68]+M[55]*M[69]+M[56]*M[70]+
M[57]*M[71]+M[58]*M[72]+M[59]*M[73]+M[60]*M[74]+M[61]*M[75]+M[62]*M[76]+M[6
3]*M[77]+M[64]*M[78]+M[65]*M[79]+M[66]*M[80]+M[67]*M[81]+M[68]*M[82]+M[69]*
```

```
M[83]+M[70]*M[84]+M[71]*M[85]+M[72]*M[86]+M[73]*M[87]+M[74]*M[88]+M[75]*M[8
9]+M[76]*M[90]+M[77]*M[91]+M[78]*M[92]+M[79]*M[93]+M[80]*M[94]+M[81]*M[95]+
M[82]*M[96]+M[83]*M[97]+M[84]*M[98]+M[85]*M[99]+M[100]*M[114]+M[100]*M[185]
+M[101]*M[115]+M[101]*M[186]+M[102]*M[116]+M[102]*M[187]+M[103]*M[117]+M[10
3]*M[188]+M[104]*M[118]+M[104]*M[189]+M[105]*M[119]+M[105]*M[190]+M[106]*M[1
20]+M[106]*M[191]+M[107]*M[121]+M[107]*M[192]+M[108]*M[122]+M[108]*M[193]+M[
109]*M[123]+M[109]*M[194]+M[110]*M[124]+M[110]*M[195]+M[111]*M[125]+M[111]*M
[196]+M[112]*M[126]+M[112]*M[197]+M[113]*M[127]+M[113]*M[198]+M[114]*M[128]+
M[115]*M[129]+M[116]*M[130]+M[117]*M[131]+M[118]*M[132]+M[119]*M[133]+M[120]
*M[134]+M[121]*M[135]+M[122]*M[136]+M[123]*M[137]+M[124]*M[138]+M[125]*M[13
9]+M[126]*M[140]+M[127]*M[141]+M[128]*M[142]+M[129]*M[143]+M[130]*M[144]+M[1
31]*M[145]+M[132]*M[146]+M[133]*M[147]+M[134]*M[148]+M[135]*M[149]+M[136]*M[
150]+M[137]*M[151]+M[138]*M[152]+M[139]*M[153]+M[140]*M[154]+M[141]*M[155]+
M[142]*M[156]+M[143]*M[157]+M[144]*M[158]+M[145]*M[159]+M[146]*M[160]+M[147]
*M[161]+M[148]*M[162]+M[149]*M[163]+M[150]*M[164]+M[151]*M[165]+M[152]*M[16
6]+M[153]*M[167]+M[154]*M[168]+M[155]*M[169]+M[156]*M[170]+M[157]*M[171]+M[1
58]*M[172]+M[159]*M[173]+M[160]*M[174]+M[161]*M[175]+M[162]*M[176]+M[163]*M[
177]+M[164]*M[178]+M[165]*M[179]+M[166]*M[180]+M[167]*M[181]+M[168]*M[182]+
M[169]*M[183]+M[170]*M[184]+M[171]*M[185]+M[172]*M[186]+M[173]*M[187]+M[174]
*M[188]+M[175]*M[189]+M[176]*M[190]+M[177]*M[191]+M[178]*M[192]+M[179]*M[19
3]+M[180]*M[194]+M[181]*M[195]+M[182]*M[196]+M[183]*M[197]+M[184]*M[198]+2);
```

```
   of = of +
abs(M[1]*M[16]+M[1]*M[85]+M[2]*M[17]+M[2]*M[86]+M[3]*M[18]+M[3]*M[87]+M[4]*
M[19]+M[4]*M[88]+M[5]*M[20]+M[5]*M[89]+M[6]*M[21]+M[6]*M[90]+M[7]*M[22]+M[7
]*M[91]+M[8]*M[23]+M[8]*M[92]+M[9]*M[24]+M[9]*M[93]+M[10]*M[25]+M[10]*M[94]+
M[11]*M[26]+M[11]*M[95]+M[12]*M[27]+M[12]*M[96]+M[13]*M[28]+M[13]*M[97]+M[1
4]*M[29]+M[14]*M[98]+M[15]*M[30]+M[15]*M[99]+M[16]*M[31]+M[17]*M[32]+M[18]*
M[33]+M[19]*M[34]+M[20]*M[35]+M[21]*M[36]+M[22]*M[37]+M[23]*M[38]+M[24]*M[3
9]+M[25]*M[40]+M[26]*M[41]+M[27]*M[42]+M[28]*M[43]+M[29]*M[44]+M[30]*M[45]+
M[31]*M[46]+M[32]*M[47]+M[33]*M[48]+M[34]*M[49]+M[35]*M[50]+M[36]*M[51]+M[3
7]*M[52]+M[38]*M[53]+M[39]*M[54]+M[40]*M[55]+M[41]*M[56]+M[42]*M[57]+M[43]*
M[58]+M[44]*M[59]+M[45]*M[60]+M[46]*M[61]+M[47]*M[62]+M[48]*M[63]+M[49]*M[6
4]+M[50]*M[65]+M[51]*M[66]+M[52]*M[67]+M[53]*M[68]+M[54]*M[69]+M[55]*M[70]+
M[56]*M[71]+M[57]*M[72]+M[58]*M[73]+M[59]*M[74]+M[60]*M[75]+M[61]*M[76]+M[6
2]*M[77]+M[63]*M[78]+M[64]*M[79]+M[65]*M[80]+M[66]*M[81]+M[67]*M[82]+M[68]*
M[83]+M[69]*M[84]+M[70]*M[85]+M[71]*M[86]+M[72]*M[87]+M[73]*M[88]+M[74]*M[8
9]+M[75]*M[90]+M[76]*M[91]+M[77]*M[92]+M[78]*M[93]+M[79]*M[94]+M[80]*M[95]+
M[81]*M[96]+M[82]*M[97]+M[83]*M[98]+M[84]*M[99]+M[100]*M[115]+M[100]*M[184]
+M[101]*M[116]+M[101]*M[185]+M[102]*M[117]+M[102]*M[186]+M[103]*M[118]+M[10
3]*M[187]+M[104]*M[119]+M[104]*M[188]+M[105]*M[120]+M[105]*M[189]+M[106]*M[1
21]+M[106]*M[190]+M[107]*M[122]+M[107]*M[191]+M[108]*M[123]+M[108]*M[192]+M[
109]*M[124]+M[109]*M[193]+M[110]*M[125]+M[110]*M[194]+M[111]*M[126]+M[111]*M
[195]+M[112]*M[127]+M[112]*M[196]+M[113]*M[128]+M[113]*M[197]+M[114]*M[129]+
M[114]*M[198]+M[115]*M[130]+M[116]*M[131]+M[117]*M[132]+M[118]*M[133]+M[119]
```

```
*M[134]+M[120]*M[135]+M[121]*M[136]+M[122]*M[137]+M[123]*M[138]+M[124]*M[13
9]+M[125]*M[140]+M[126]*M[141]+M[127]*M[142]+M[128]*M[143]+M[129]*M[144]+M[1
30]*M[145]+M[131]*M[146]+M[132]*M[147]+M[133]*M[148]+M[134]*M[149]+M[135]*M[
150]+M[136]*M[151]+M[137]*M[152]+M[138]*M[153]+M[139]*M[154]+M[140]*M[155]+
M[141]*M[156]+M[142]*M[157]+M[143]*M[158]+M[144]*M[159]+M[145]*M[160]+M[146]
*M[161]+M[147]*M[162]+M[148]*M[163]+M[149]*M[164]+M[150]*M[165]+M[151]*M[16
6]+M[152]*M[167]+M[153]*M[168]+M[154]*M[169]+M[155]*M[170]+M[156]*M[171]+M[1
57]*M[172]+M[158]*M[173]+M[159]*M[174]+M[160]*M[175]+M[161]*M[176]+M[162]*M[
177]+M[163]*M[178]+M[164]*M[179]+M[165]*M[180]+M[166]*M[181]+M[167]*M[182]+
M[168]*M[183]+M[169]*M[184]+M[170]*M[185]+M[171]*M[186]+M[172]*M[187]+M[173]
*M[188]+M[174]*M[189]+M[175]*M[190]+M[176]*M[191]+M[177]*M[192]+M[178]*M[19
3]+M[179]*M[194]+M[180]*M[195]+M[181]*M[196]+M[182]*M[197]+M[183]*M[198]+2);

  of = of +
abs(M[1]*M[13]+M[1]*M[88]+M[2]*M[14]+M[2]*M[89]+M[3]*M[15]+M[3]*M[90]+M[4]*
M[16]+M[4]*M[91]+M[5]*M[17]+M[5]*M[92]+M[6]*M[18]+M[6]*M[93]+M[7]*M[19]+M[7
]*M[94]+M[8]*M[20]+M[8]*M[95]+M[9]*M[21]+M[9]*M[96]+M[10]*M[22]+M[10]*M[97]+
M[11]*M[23]+M[11]*M[98]+M[12]*M[24]+M[12]*M[99]+M[13]*M[25]+M[14]*M[26]+M[1
5]*M[27]+M[16]*M[28]+M[17]*M[29]+M[18]*M[30]+M[19]*M[31]+M[20]*M[32]+M[21]*
M[33]+M[22]*M[34]+M[23]*M[35]+M[24]*M[36]+M[25]*M[37]+M[26]*M[38]+M[27]*M[3
9]+M[28]*M[40]+M[29]*M[41]+M[30]*M[42]+M[31]*M[43]+M[32]*M[44]+M[33]*M[45]+
M[34]*M[46]+M[35]*M[47]+M[36]*M[48]+M[37]*M[49]+M[38]*M[50]+M[39]*M[51]+M[4
0]*M[52]+M[41]*M[53]+M[42]*M[54]+M[43]*M[55]+M[44]*M[56]+M[45]*M[57]+M[46]*
```

M[58]+M[47]*M[59]+M[48]*M[60]+M[49]*M[61]+M[50]*M[62]+M[51]*M[63]+M[52]*M[6
4]+M[53]*M[65]+M[54]*M[66]+M[55]*M[67]+M[56]*M[68]+M[57]*M[69]+M[58]*M[70]+
M[59]*M[71]+M[60]*M[72]+M[61]*M[73]+M[62]*M[74]+M[63]*M[75]+M[64]*M[76]+M[6
5]*M[77]+M[66]*M[78]+M[67]*M[79]+M[68]*M[80]+M[69]*M[81]+M[70]*M[82]+M[71]*
M[83]+M[72]*M[84]+M[73]*M[85]+M[74]*M[86]+M[75]*M[87]+M[76]*M[88]+M[77]*M[8
9]+M[78]*M[90]+M[79]*M[91]+M[80]*M[92]+M[81]*M[93]+M[82]*M[94]+M[83]*M[95]+
M[84]*M[96]+M[85]*M[97]+M[86]*M[98]+M[87]*M[99]+M[100]*M[112]+M[100]*M[187]
+M[101]*M[113]+M[101]*M[188]+M[102]*M[114]+M[102]*M[189]+M[103]*M[115]+M[10
3]*M[190]+M[104]*M[116]+M[104]*M[191]+M[105]*M[117]+M[105]*M[192]+M[106]*M[1
18]+M[106]*M[193]+M[107]*M[119]+M[107]*M[194]+M[108]*M[120]+M[108]*M[195]+M[
109]*M[121]+M[109]*M[196]+M[110]*M[122]+M[110]*M[197]+M[111]*M[123]+M[111]*M
[198]+M[112]*M[124]+M[113]*M[125]+M[114]*M[126]+M[115]*M[127]+M[116]*M[128]+
M[117]*M[129]+M[118]*M[130]+M[119]*M[131]+M[120]*M[132]+M[121]*M[133]+M[122]
*M[134]+M[123]*M[135]+M[124]*M[136]+M[125]*M[137]+M[126]*M[138]+M[127]*M[13
9]+M[128]*M[140]+M[129]*M[141]+M[130]*M[142]+M[131]*M[143]+M[132]*M[144]+M[1
33]*M[145]+M[134]*M[146]+M[135]*M[147]+M[136]*M[148]+M[137]*M[149]+M[138]*M[
150]+M[139]*M[151]+M[140]*M[152]+M[141]*M[153]+M[142]*M[154]+M[143]*M[155]+
M[144]*M[156]+M[145]*M[157]+M[146]*M[158]+M[147]*M[159]+M[148]*M[160]+M[149]
*M[161]+M[150]*M[162]+M[151]*M[163]+M[152]*M[164]+M[153]*M[165]+M[154]*M[16
6]+M[155]*M[167]+M[156]*M[168]+M[157]*M[169]+M[158]*M[170]+M[159]*M[171]+M[1
60]*M[172]+M[161]*M[173]+M[162]*M[174]+M[163]*M[175]+M[164]*M[176]+M[165]*M[
177]+M[166]*M[178]+M[167]*M[179]+M[168]*M[180]+M[169]*M[181]+M[170]*M[182]+
M[171]*M[183]+M[172]*M[184]+M[173]*M[185]+M[174]*M[186]+M[175]*M[187]+M[176]

```
*M[188]+M[177]*M[189]+M[178]*M[190]+M[179]*M[191]+M[180]*M[192]+M[181]*M[19
3]+M[182]*M[194]+M[183]*M[195]+M[184]*M[196]+M[185]*M[197]+M[186]*M[198]+2);

   of = of +
abs(M[1]*M[14]+M[1]*M[87]+M[2]*M[15]+M[2]*M[88]+M[3]*M[16]+M[3]*M[89]+M[4]*
M[17]+M[4]*M[90]+M[5]*M[18]+M[5]*M[91]+M[6]*M[19]+M[6]*M[92]+M[7]*M[20]+M[7
]*M[93]+M[8]*M[21]+M[8]*M[94]+M[9]*M[22]+M[9]*M[95]+M[10]*M[23]+M[10]*M[96]+
M[11]*M[24]+M[11]*M[97]+M[12]*M[25]+M[12]*M[98]+M[13]*M[26]+M[13]*M[99]+M[1
4]*M[27]+M[15]*M[28]+M[16]*M[29]+M[17]*M[30]+M[18]*M[31]+M[19]*M[32]+M[20]*
M[33]+M[21]*M[34]+M[22]*M[35]+M[23]*M[36]+M[24]*M[37]+M[25]*M[38]+M[26]*M[3
9]+M[27]*M[40]+M[28]*M[41]+M[29]*M[42]+M[30]*M[43]+M[31]*M[44]+M[32]*M[45]+
M[33]*M[46]+M[34]*M[47]+M[35]*M[48]+M[36]*M[49]+M[37]*M[50]+M[38]*M[51]+M[3
9]*M[52]+M[40]*M[53]+M[41]*M[54]+M[42]*M[55]+M[43]*M[56]+M[44]*M[57]+M[45]*
M[58]+M[46]*M[59]+M[47]*M[60]+M[48]*M[61]+M[49]*M[62]+M[50]*M[63]+M[51]*M[6
4]+M[52]*M[65]+M[53]*M[66]+M[54]*M[67]+M[55]*M[68]+M[56]*M[69]+M[57]*M[70]+
M[58]*M[71]+M[59]*M[72]+M[60]*M[73]+M[61]*M[74]+M[62]*M[75]+M[63]*M[76]+M[6
4]*M[77]+M[65]*M[78]+M[66]*M[79]+M[67]*M[80]+M[68]*M[81]+M[69]*M[82]+M[70]*
M[83]+M[71]*M[84]+M[72]*M[85]+M[73]*M[86]+M[74]*M[87]+M[75]*M[88]+M[76]*M[8
9]+M[77]*M[90]+M[78]*M[91]+M[79]*M[92]+M[80]*M[93]+M[81]*M[94]+M[82]*M[95]+
M[83]*M[96]+M[84]*M[97]+M[85]*M[98]+M[86]*M[99]+M[100]*M[113]+M[100]*M[186]
+M[101]*M[114]+M[101]*M[187]+M[102]*M[115]+M[102]*M[188]+M[103]*M[116]+M[10
3]*M[189]+M[104]*M[117]+M[104]*M[190]+M[105]*M[118]+M[105]*M[191]+M[106]*M[1
19]+M[106]*M[192]+M[107]*M[120]+M[107]*M[193]+M[108]*M[121]+M[108]*M[194]+M[
109]*M[122]+M[109]*M[195]+M[110]*M[123]+M[110]*M[196]+M[111]*M[124]+M[111]*M
[197]+M[112]*M[125]+M[112]*M[198]+M[113]*M[126]+M[114]*M[127]+M[115]*M[128]+
M[116]*M[129]+M[117]*M[130]+M[118]*M[131]+M[119]*M[132]+M[120]*M[133]+M[121]
*M[134]+M[122]*M[135]+M[123]*M[136]+M[124]*M[137]+M[125]*M[138]+M[126]*M[13
9]+M[127]*M[140]+M[128]*M[141]+M[129]*M[142]+M[130]*M[143]+M[131]*M[144]+M[1
32]*M[145]+M[133]*M[146]+M[134]*M[147]+M[135]*M[148]+M[136]*M[149]+M[137]*M[
150]+M[138]*M[151]+M[139]*M[152]+M[140]*M[153]+M[141]*M[154]+M[142]*M[155]+
M[143]*M[156]+M[144]*M[157]+M[145]*M[158]+M[146]*M[159]+M[147]*M[160]+M[148]
*M[161]+M[149]*M[162]+M[150]*M[163]+M[151]*M[164]+M[152]*M[165]+M[153]*M[16
6]+M[154]*M[167]+M[155]*M[168]+M[156]*M[169]+M[157]*M[170]+M[158]*M[171]+M[1
59]*M[172]+M[160]*M[173]+M[161]*M[174]+M[162]*M[175]+M[163]*M[176]+M[164]*M[
177]+M[165]*M[178]+M[166]*M[179]+M[167]*M[180]+M[168]*M[181]+M[169]*M[182]+
M[170]*M[183]+M[171]*M[184]+M[172]*M[185]+M[173]*M[186]+M[174]*M[187]+M[175]
*M[188]+M[176]*M[189]+M[177]*M[190]+M[178]*M[191]+M[179]*M[192]+M[180]*M[19
3]+M[181]*M[194]+M[182]*M[195]+M[183]*M[196]+M[184]*M[197]+M[185]*M[198]+2);

   of = of +
abs(M[1]*M[12]+M[1]*M[89]+M[2]*M[13]+M[2]*M[90]+M[3]*M[14]+M[3]*M[91]+M[4]*
M[15]+M[4]*M[92]+M[5]*M[16]+M[5]*M[93]+M[6]*M[17]+M[6]*M[94]+M[7]*M[18]+M[7
]*M[95]+M[8]*M[19]+M[8]*M[96]+M[9]*M[20]+M[9]*M[97]+M[10]*M[21]+M[10]*M[98]+
M[11]*M[22]+M[11]*M[99]+M[12]*M[23]+M[13]*M[24]+M[14]*M[25]+M[15]*M[26]+M[1
6]*M[27]+M[17]*M[28]+M[18]*M[29]+M[19]*M[30]+M[20]*M[31]+M[21]*M[32]+M[22]*
M[33]+M[23]*M[34]+M[24]*M[35]+M[25]*M[36]+M[26]*M[37]+M[27]*M[38]+M[28]*M[3
```

9]+M[29]*M[40]+M[30]*M[41]+M[31]*M[42]+M[32]*M[43]+M[33]*M[44]+M[34]*M[45]+
M[35]*M[46]+M[36]*M[47]+M[37]*M[48]+M[38]*M[49]+M[39]*M[50]+M[40]*M[51]+M[4
1]*M[52]+M[42]*M[53]+M[43]*M[54]+M[44]*M[55]+M[45]*M[56]+M[46]*M[57]+M[47]*
M[58]+M[48]*M[59]+M[49]*M[60]+M[50]*M[61]+M[51]*M[62]+M[52]*M[63]+M[53]*M[6
4]+M[54]*M[65]+M[55]*M[66]+M[56]*M[67]+M[57]*M[68]+M[58]*M[69]+M[59]*M[70]+
M[60]*M[71]+M[61]*M[72]+M[62]*M[73]+M[63]*M[74]+M[64]*M[75]+M[65]*M[76]+M[6
6]*M[77]+M[67]*M[78]+M[68]*M[79]+M[69]*M[80]+M[70]*M[81]+M[71]*M[82]+M[72]*
M[83]+M[73]*M[84]+M[74]*M[85]+M[75]*M[86]+M[76]*M[87]+M[77]*M[88]+M[78]*M[8
9]+M[79]*M[90]+M[80]*M[91]+M[81]*M[92]+M[82]*M[93]+M[83]*M[94]+M[84]*M[95]+
M[85]*M[96]+M[86]*M[97]+M[87]*M[98]+M[88]*M[99]+M[100]*M[111]+M[100]*M[188]+
M[101]*M[112]+M[101]*M[189]+M[102]*M[113]+M[102]*M[190]+M[103]*M[114]+M[103]
*M[191]+M[104]*M[115]+M[104]*M[192]+M[105]*M[116]+M[105]*M[193]+M[106]*M[117
]+M[106]*M[194]+M[107]*M[118]+M[107]*M[195]+M[108]*M[119]+M[108]*M[196]+M[10
9]*M[120]+M[109]*M[197]+M[110]*M[121]+M[110]*M[198]+M[111]*M[122]+M[112]*M[1
23]+M[113]*M[124]+M[114]*M[125]+M[115]*M[126]+M[116]*M[127]+M[117]*M[128]+M[
118]*M[129]+M[119]*M[130]+M[120]*M[131]+M[121]*M[132]+M[122]*M[133]+M[123]*
M[134]+M[124]*M[135]+M[125]*M[136]+M[126]*M[137]+M[127]*M[138]+M[128]*M[139]
+M[129]*M[140]+M[130]*M[141]+M[131]*M[142]+M[132]*M[143]+M[133]*M[144]+M[13
4]*M[145]+M[135]*M[146]+M[136]*M[147]+M[137]*M[148]+M[138]*M[149]+M[139]*M[1
50]+M[140]*M[151]+M[141]*M[152]+M[142]*M[153]+M[143]*M[154]+M[144]*M[155]+M[
145]*M[156]+M[146]*M[157]+M[147]*M[158]+M[148]*M[159]+M[149]*M[160]+M[150]*
M[161]+M[151]*M[162]+M[152]*M[163]+M[153]*M[164]+M[154]*M[165]+M[155]*M[166]
+M[156]*M[167]+M[157]*M[168]+M[158]*M[169]+M[159]*M[170]+M[160]*M[171]+M[16

```
1]*M[172]+M[162]*M[173]+M[163]*M[174]+M[164]*M[175]+M[165]*M[176]+M[166]*M[1
77]+M[167]*M[178]+M[168]*M[179]+M[169]*M[180]+M[170]*M[181]+M[171]*M[182]+M[
172]*M[183]+M[173]*M[184]+M[174]*M[185]+M[175]*M[186]+M[176]*M[187]+M[177]*
M[188]+M[178]*M[189]+M[179]*M[190]+M[180]*M[191]+M[181]*M[192]+M[182]*M[193]
+M[183]*M[194]+M[184]*M[195]+M[185]*M[196]+M[186]*M[197]+M[187]*M[198]+2);

  of = of +
abs(M[1]*M[39]+M[1]*M[62]+M[2]*M[40]+M[2]*M[63]+M[3]*M[41]+M[3]*M[64]+M[4]*
M[42]+M[4]*M[65]+M[5]*M[43]+M[5]*M[66]+M[6]*M[44]+M[6]*M[67]+M[7]*M[45]+M[7
]*M[68]+M[8]*M[46]+M[8]*M[69]+M[9]*M[47]+M[9]*M[70]+M[10]*M[48]+M[10]*M[71]+
M[11]*M[49]+M[11]*M[72]+M[12]*M[50]+M[12]*M[73]+M[13]*M[51]+M[13]*M[74]+M[1
4]*M[52]+M[14]*M[75]+M[15]*M[53]+M[15]*M[76]+M[16]*M[54]+M[16]*M[77]+M[17]*
M[55]+M[17]*M[78]+M[18]*M[56]+M[18]*M[79]+M[19]*M[57]+M[19]*M[80]+M[20]*M[5
8]+M[20]*M[81]+M[21]*M[59]+M[21]*M[82]+M[22]*M[60]+M[22]*M[83]+M[23]*M[61]+
M[23]*M[84]+M[24]*M[62]+M[24]*M[85]+M[25]*M[63]+M[25]*M[86]+M[26]*M[64]+M[2
6]*M[87]+M[27]*M[65]+M[27]*M[88]+M[28]*M[66]+M[28]*M[89]+M[29]*M[67]+M[29]*
M[90]+M[30]*M[68]+M[30]*M[91]+M[31]*M[69]+M[31]*M[92]+M[32]*M[70]+M[32]*M[9
3]+M[33]*M[71]+M[33]*M[94]+M[34]*M[72]+M[34]*M[95]+M[35]*M[73]+M[35]*M[96]+
M[36]*M[74]+M[36]*M[97]+M[37]*M[75]+M[37]*M[98]+M[38]*M[76]+M[38]*M[99]+M[3
9]*M[77]+M[40]*M[78]+M[41]*M[79]+M[42]*M[80]+M[43]*M[81]+M[44]*M[82]+M[45]*
M[83]+M[46]*M[84]+M[47]*M[85]+M[48]*M[86]+M[49]*M[87]+M[50]*M[88]+M[51]*M[8
9]+M[52]*M[90]+M[53]*M[91]+M[54]*M[92]+M[55]*M[93]+M[56]*M[94]+M[57]*M[95]+
M[58]*M[96]+M[59]*M[97]+M[60]*M[98]+M[61]*M[99]+M[100]*M[138]+M[100]*M[161]
```

```
+M[101]*M[139]+M[101]*M[162]+M[102]*M[140]+M[102]*M[163]+M[103]*M[141]+M[10
3]*M[164]+M[104]*M[142]+M[104]*M[165]+M[105]*M[143]+M[105]*M[166]+M[106]*M[1
44]+M[106]*M[167]+M[107]*M[145]+M[107]*M[168]+M[108]*M[146]+M[108]*M[169]+M[
109]*M[147]+M[109]*M[170]+M[110]*M[148]+M[110]*M[171]+M[111]*M[149]+M[111]*M
[172]+M[112]*M[150]+M[112]*M[173]+M[113]*M[151]+M[113]*M[174]+M[114]*M[152]+
M[114]*M[175]+M[115]*M[153]+M[115]*M[176]+M[116]*M[154]+M[116]*M[177]+M[117]
*M[155]+M[117]*M[178]+M[118]*M[156]+M[118]*M[179]+M[119]*M[157]+M[119]*M[180
]+M[120]*M[158]+M[120]*M[181]+M[121]*M[159]+M[121]*M[182]+M[122]*M[160]+M[12
2]*M[183]+M[123]*M[161]+M[123]*M[184]+M[124]*M[162]+M[124]*M[185]+M[125]*M[1
63]+M[125]*M[186]+M[126]*M[164]+M[126]*M[187]+M[127]*M[165]+M[127]*M[188]+M[
128]*M[166]+M[128]*M[189]+M[129]*M[167]+M[129]*M[190]+M[130]*M[168]+M[130]*
M[191]+M[131]*M[169]+M[131]*M[192]+M[132]*M[170]+M[132]*M[193]+M[133]*M[171]
+M[133]*M[194]+M[134]*M[172]+M[134]*M[195]+M[135]*M[173]+M[135]*M[196]+M[13
6]*M[174]+M[136]*M[197]+M[137]*M[175]+M[137]*M[198]+M[138]*M[176]+M[139]*M[1
77]+M[140]*M[178]+M[141]*M[179]+M[142]*M[180]+M[143]*M[181]+M[144]*M[182]+M[
145]*M[183]+M[146]*M[184]+M[147]*M[185]+M[148]*M[186]+M[149]*M[187]+M[150]*
M[188]+M[151]*M[189]+M[152]*M[190]+M[153]*M[191]+M[154]*M[192]+M[155]*M[193]
+M[156]*M[194]+M[157]*M[195]+M[158]*M[196]+M[159]*M[197]+M[160]*M[198]+2);

   of = of +
abs(M[1]*M[38]+M[1]*M[63]+M[2]*M[39]+M[2]*M[64]+M[3]*M[40]+M[3]*M[65]+M[4]*
M[41]+M[4]*M[66]+M[5]*M[42]+M[5]*M[67]+M[6]*M[43]+M[6]*M[68]+M[7]*M[44]+M[7
]*M[69]+M[8]*M[45]+M[8]*M[70]+M[9]*M[46]+M[9]*M[71]+M[10]*M[47]+M[10]*M[72]+
```

M[11]*M[48]+M[11]*M[73]+M[12]*M[49]+M[12]*M[74]+M[13]*M[50]+M[13]*M[75]+M[1
4]*M[51]+M[14]*M[76]+M[15]*M[52]+M[15]*M[77]+M[16]*M[53]+M[16]*M[78]+M[17]*
M[54]+M[17]*M[79]+M[18]*M[55]+M[18]*M[80]+M[19]*M[56]+M[19]*M[81]+M[20]*M[5
7]+M[20]*M[82]+M[21]*M[58]+M[21]*M[83]+M[22]*M[59]+M[22]*M[84]+M[23]*M[60]+
M[23]*M[85]+M[24]*M[61]+M[24]*M[86]+M[25]*M[62]+M[25]*M[87]+M[26]*M[63]+M[2
6]*M[88]+M[27]*M[64]+M[27]*M[89]+M[28]*M[65]+M[28]*M[90]+M[29]*M[66]+M[29]*
M[91]+M[30]*M[67]+M[30]*M[92]+M[31]*M[68]+M[31]*M[93]+M[32]*M[69]+M[32]*M[9
4]+M[33]*M[70]+M[33]*M[95]+M[34]*M[71]+M[34]*M[96]+M[35]*M[72]+M[35]*M[97]+
M[36]*M[73]+M[36]*M[98]+M[37]*M[74]+M[37]*M[99]+M[38]*M[75]+M[39]*M[76]+M[4
0]*M[77]+M[41]*M[78]+M[42]*M[79]+M[43]*M[80]+M[44]*M[81]+M[45]*M[82]+M[46]*
M[83]+M[47]*M[84]+M[48]*M[85]+M[49]*M[86]+M[50]*M[87]+M[51]*M[88]+M[52]*M[8
9]+M[53]*M[90]+M[54]*M[91]+M[55]*M[92]+M[56]*M[93]+M[57]*M[94]+M[58]*M[95]+
M[59]*M[96]+M[60]*M[97]+M[61]*M[98]+M[62]*M[99]+M[100]*M[137]+M[100]*M[162]
+M[101]*M[138]+M[101]*M[163]+M[102]*M[139]+M[102]*M[164]+M[103]*M[140]+M[10
3]*M[165]+M[104]*M[141]+M[104]*M[166]+M[105]*M[142]+M[105]*M[167]+M[106]*M[1
43]+M[106]*M[168]+M[107]*M[144]+M[107]*M[169]+M[108]*M[145]+M[108]*M[170]+M[
109]*M[146]+M[109]*M[171]+M[110]*M[147]+M[110]*M[172]+M[111]*M[148]+M[111]*M
[173]+M[112]*M[149]+M[112]*M[174]+M[113]*M[150]+M[113]*M[175]+M[114]*M[151]+
M[114]*M[176]+M[115]*M[152]+M[115]*M[177]+M[116]*M[153]+M[116]*M[178]+M[117]
*M[154]+M[117]*M[179]+M[118]*M[155]+M[118]*M[180]+M[119]*M[156]+M[119]*M[181
]+M[120]*M[157]+M[120]*M[182]+M[121]*M[158]+M[121]*M[183]+M[122]*M[159]+M[12
2]*M[184]+M[123]*M[160]+M[123]*M[185]+M[124]*M[161]+M[124]*M[186]+M[125]*M[1
62]+M[125]*M[187]+M[126]*M[163]+M[126]*M[188]+M[127]*M[164]+M[127]*M[189]+M[

```
128]*M[165]+M[128]*M[190]+M[129]*M[166]+M[129]*M[191]+M[130]*M[167]+M[130]*
M[192]+M[131]*M[168]+M[131]*M[193]+M[132]*M[169]+M[132]*M[194]+M[133]*M[170]
+M[133]*M[195]+M[134]*M[171]+M[134]*M[196]+M[135]*M[172]+M[135]*M[197]+M[13
6]*M[173]+M[136]*M[198]+M[137]*M[174]+M[138]*M[175]+M[139]*M[176]+M[140]*M[1
77]+M[141]*M[178]+M[142]*M[179]+M[143]*M[180]+M[144]*M[181]+M[145]*M[182]+M[
146]*M[183]+M[147]*M[184]+M[148]*M[185]+M[149]*M[186]+M[150]*M[187]+M[151]*
M[188]+M[152]*M[189]+M[153]*M[190]+M[154]*M[191]+M[155]*M[192]+M[156]*M[193]
+M[157]*M[194]+M[158]*M[195]+M[159]*M[196]+M[160]*M[197]+M[161]*M[198]+2);

   of = of +
abs(M[1]*M[37]+M[1]*M[64]+M[2]*M[38]+M[2]*M[65]+M[3]*M[39]+M[3]*M[66]+M[4]*
M[40]+M[4]*M[67]+M[5]*M[41]+M[5]*M[68]+M[6]*M[42]+M[6]*M[69]+M[7]*M[43]+M[7
]*M[70]+M[8]*M[44]+M[8]*M[71]+M[9]*M[45]+M[9]*M[72]+M[10]*M[46]+M[10]*M[73]+
M[11]*M[47]+M[11]*M[74]+M[12]*M[48]+M[12]*M[75]+M[13]*M[49]+M[13]*M[76]+M[1
4]*M[50]+M[14]*M[77]+M[15]*M[51]+M[15]*M[78]+M[16]*M[52]+M[16]*M[79]+M[17]*
M[53]+M[17]*M[80]+M[18]*M[54]+M[18]*M[81]+M[19]*M[55]+M[19]*M[82]+M[20]*M[5
6]+M[20]*M[83]+M[21]*M[57]+M[21]*M[84]+M[22]*M[58]+M[22]*M[85]+M[23]*M[59]+
M[23]*M[86]+M[24]*M[60]+M[24]*M[87]+M[25]*M[61]+M[25]*M[88]+M[26]*M[62]+M[2
6]*M[89]+M[27]*M[63]+M[27]*M[90]+M[28]*M[64]+M[28]*M[91]+M[29]*M[65]+M[29]*
M[92]+M[30]*M[66]+M[30]*M[93]+M[31]*M[67]+M[31]*M[94]+M[32]*M[68]+M[32]*M[9
5]+M[33]*M[69]+M[33]*M[96]+M[34]*M[70]+M[34]*M[97]+M[35]*M[71]+M[35]*M[98]+
M[36]*M[72]+M[36]*M[99]+M[37]*M[73]+M[38]*M[74]+M[39]*M[75]+M[40]*M[76]+M[4
1]*M[77]+M[42]*M[78]+M[43]*M[79]+M[44]*M[80]+M[45]*M[81]+M[46]*M[82]+M[47]*
```

```
M[83]+M[48]*M[84]+M[49]*M[85]+M[50]*M[86]+M[51]*M[87]+M[52]*M[88]+M[53]*M[8
9]+M[54]*M[90]+M[55]*M[91]+M[56]*M[92]+M[57]*M[93]+M[58]*M[94]+M[59]*M[95]+
M[60]*M[96]+M[61]*M[97]+M[62]*M[98]+M[63]*M[99]+M[100]*M[136]+M[100]*M[163]
+M[101]*M[137]+M[101]*M[164]+M[102]*M[138]+M[102]*M[165]+M[103]*M[139]+M[10
3]*M[166]+M[104]*M[140]+M[104]*M[167]+M[105]*M[141]+M[105]*M[168]+M[106]*M[1
42]+M[106]*M[169]+M[107]*M[143]+M[107]*M[170]+M[108]*M[144]+M[108]*M[171]+M[
109]*M[145]+M[109]*M[172]+M[110]*M[146]+M[110]*M[173]+M[111]*M[147]+M[111]*M
[174]+M[112]*M[148]+M[112]*M[175]+M[113]*M[149]+M[113]*M[176]+M[114]*M[150]+
M[114]*M[177]+M[115]*M[151]+M[115]*M[178]+M[116]*M[152]+M[116]*M[179]+M[117]
*M[153]+M[117]*M[180]+M[118]*M[154]+M[118]*M[181]+M[119]*M[155]+M[119]*M[182
]+M[120]*M[156]+M[120]*M[183]+M[121]*M[157]+M[121]*M[184]+M[122]*M[158]+M[12
2]*M[185]+M[123]*M[159]+M[123]*M[186]+M[124]*M[160]+M[124]*M[187]+M[125]*M[1
61]+M[125]*M[188]+M[126]*M[162]+M[126]*M[189]+M[127]*M[163]+M[127]*M[190]+M[
128]*M[164]+M[128]*M[191]+M[129]*M[165]+M[129]*M[192]+M[130]*M[166]+M[130]*
M[193]+M[131]*M[167]+M[131]*M[194]+M[132]*M[168]+M[132]*M[195]+M[133]*M[169]
+M[133]*M[196]+M[134]*M[170]+M[134]*M[197]+M[135]*M[171]+M[135]*M[198]+M[13
6]*M[172]+M[137]*M[173]+M[138]*M[174]+M[139]*M[175]+M[140]*M[176]+M[141]*M[1
77]+M[142]*M[178]+M[143]*M[179]+M[144]*M[180]+M[145]*M[181]+M[146]*M[182]+M[
147]*M[183]+M[148]*M[184]+M[149]*M[185]+M[150]*M[186]+M[151]*M[187]+M[152]*
M[188]+M[153]*M[189]+M[154]*M[190]+M[155]*M[191]+M[156]*M[192]+M[157]*M[193]
+M[158]*M[194]+M[159]*M[195]+M[160]*M[196]+M[161]*M[197]+M[162]*M[198]+2);
```

```
   of = of +
abs(M[1]*M[36]+M[1]*M[65]+M[2]*M[37]+M[2]*M[66]+M[3]*M[38]+M[3]*M[67]+M[4]*
M[39]+M[4]*M[68]+M[5]*M[40]+M[5]*M[69]+M[6]*M[41]+M[6]*M[70]+M[7]*M[42]+M[7
]*M[71]+M[8]*M[43]+M[8]*M[72]+M[9]*M[44]+M[9]*M[73]+M[10]*M[45]+M[10]*M[74]+
M[11]*M[46]+M[11]*M[75]+M[12]*M[47]+M[12]*M[76]+M[13]*M[48]+M[13]*M[77]+M[1
4]*M[49]+M[14]*M[78]+M[15]*M[50]+M[15]*M[79]+M[16]*M[51]+M[16]*M[80]+M[17]*
M[52]+M[17]*M[81]+M[18]*M[53]+M[18]*M[82]+M[19]*M[54]+M[19]*M[83]+M[20]*M[5
5]+M[20]*M[84]+M[21]*M[56]+M[21]*M[85]+M[22]*M[57]+M[22]*M[86]+M[23]*M[58]+
M[23]*M[87]+M[24]*M[59]+M[24]*M[88]+M[25]*M[60]+M[25]*M[89]+M[26]*M[61]+M[2
6]*M[90]+M[27]*M[62]+M[27]*M[91]+M[28]*M[63]+M[28]*M[92]+M[29]*M[64]+M[29]*
M[93]+M[30]*M[65]+M[30]*M[94]+M[31]*M[66]+M[31]*M[95]+M[32]*M[67]+M[32]*M[9
6]+M[33]*M[68]+M[33]*M[97]+M[34]*M[69]+M[34]*M[98]+M[35]*M[70]+M[35]*M[99]+
M[36]*M[71]+M[37]*M[72]+M[38]*M[73]+M[39]*M[74]+M[40]*M[75]+M[41]*M[76]+M[4
2]*M[77]+M[43]*M[78]+M[44]*M[79]+M[45]*M[80]+M[46]*M[81]+M[47]*M[82]+M[48]*
M[83]+M[49]*M[84]+M[50]*M[85]+M[51]*M[86]+M[52]*M[87]+M[53]*M[88]+M[54]*M[8
9]+M[55]*M[90]+M[56]*M[91]+M[57]*M[92]+M[58]*M[93]+M[59]*M[94]+M[60]*M[95]+
M[61]*M[96]+M[62]*M[97]+M[63]*M[98]+M[64]*M[99]+M[100]*M[135]+M[100]*M[164]
+M[101]*M[136]+M[101]*M[165]+M[102]*M[137]+M[102]*M[166]+M[103]*M[138]+M[10
3]*M[167]+M[104]*M[139]+M[104]*M[168]+M[105]*M[140]+M[105]*M[169]+M[106]*M[1
41]+M[106]*M[170]+M[107]*M[142]+M[107]*M[171]+M[108]*M[143]+M[108]*M[172]+M[
109]*M[144]+M[109]*M[173]+M[110]*M[145]+M[110]*M[174]+M[111]*M[146]+M[111]*M
[175]+M[112]*M[147]+M[112]*M[176]+M[113]*M[148]+M[113]*M[177]+M[114]*M[149]+
M[114]*M[178]+M[115]*M[150]+M[115]*M[179]+M[116]*M[151]+M[116]*M[180]+M[117]
```

```
*M[152]+M[117]*M[181]+M[118]*M[153]+M[118]*M[182]+M[119]*M[154]+M[119]*M[183
]+M[120]*M[155]+M[120]*M[184]+M[121]*M[156]+M[121]*M[185]+M[122]*M[157]+M[12
2]*M[186]+M[123]*M[158]+M[123]*M[187]+M[124]*M[159]+M[124]*M[188]+M[125]*M[1
60]+M[125]*M[189]+M[126]*M[161]+M[126]*M[190]+M[127]*M[162]+M[127]*M[191]+M[
128]*M[163]+M[128]*M[192]+M[129]*M[164]+M[129]*M[193]+M[130]*M[165]+M[130]*
M[194]+M[131]*M[166]+M[131]*M[195]+M[132]*M[167]+M[132]*M[196]+M[133]*M[168]
+M[133]*M[197]+M[134]*M[169]+M[134]*M[198]+M[135]*M[170]+M[136]*M[171]+M[13
7]*M[172]+M[138]*M[173]+M[139]*M[174]+M[140]*M[175]+M[141]*M[176]+M[142]*M[1
77]+M[143]*M[178]+M[144]*M[179]+M[145]*M[180]+M[146]*M[181]+M[147]*M[182]+M[
148]*M[183]+M[149]*M[184]+M[150]*M[185]+M[151]*M[186]+M[152]*M[187]+M[153]*
M[188]+M[154]*M[189]+M[155]*M[190]+M[156]*M[191]+M[157]*M[192]+M[158]*M[193]
+M[159]*M[194]+M[160]*M[195]+M[161]*M[196]+M[162]*M[197]+M[163]*M[198]+2);

   of = of +
abs(M[1]*M[35]+M[1]*M[66]+M[2]*M[36]+M[2]*M[67]+M[3]*M[37]+M[3]*M[68]+M[4]*
M[38]+M[4]*M[69]+M[5]*M[39]+M[5]*M[70]+M[6]*M[40]+M[6]*M[71]+M[7]*M[41]+M[7
]*M[72]+M[8]*M[42]+M[8]*M[73]+M[9]*M[43]+M[9]*M[74]+M[10]*M[44]+M[10]*M[75]+
M[11]*M[45]+M[11]*M[76]+M[12]*M[46]+M[12]*M[77]+M[13]*M[47]+M[13]*M[78]+M[1
4]*M[48]+M[14]*M[79]+M[15]*M[49]+M[15]*M[80]+M[16]*M[50]+M[16]*M[81]+M[17]*
M[51]+M[17]*M[82]+M[18]*M[52]+M[18]*M[83]+M[19]*M[53]+M[19]*M[84]+M[20]*M[5
4]+M[20]*M[85]+M[21]*M[55]+M[21]*M[86]+M[22]*M[56]+M[22]*M[87]+M[23]*M[57]+
M[23]*M[88]+M[24]*M[58]+M[24]*M[89]+M[25]*M[59]+M[25]*M[90]+M[26]*M[60]+M[2
6]*M[91]+M[27]*M[61]+M[27]*M[92]+M[28]*M[62]+M[28]*M[93]+M[29]*M[63]+M[29]*
```

```
M[94]+M[30]*M[64]+M[30]*M[95]+M[31]*M[65]+M[31]*M[96]+M[32]*M[66]+M[32]*M[9
7]+M[33]*M[67]+M[33]*M[98]+M[34]*M[68]+M[34]*M[99]+M[35]*M[69]+M[36]*M[70]+
M[37]*M[71]+M[38]*M[72]+M[39]*M[73]+M[40]*M[74]+M[41]*M[75]+M[42]*M[76]+M[4
3]*M[77]+M[44]*M[78]+M[45]*M[79]+M[46]*M[80]+M[47]*M[81]+M[48]*M[82]+M[49]*
M[83]+M[50]*M[84]+M[51]*M[85]+M[52]*M[86]+M[53]*M[87]+M[54]*M[88]+M[55]*M[8
9]+M[56]*M[90]+M[57]*M[91]+M[58]*M[92]+M[59]*M[93]+M[60]*M[94]+M[61]*M[95]+
M[62]*M[96]+M[63]*M[97]+M[64]*M[98]+M[65]*M[99]+M[100]*M[134]+M[100]*M[165]
+M[101]*M[135]+M[101]*M[166]+M[102]*M[136]+M[102]*M[167]+M[103]*M[137]+M[10
3]*M[168]+M[104]*M[138]+M[104]*M[169]+M[105]*M[139]+M[105]*M[170]+M[106]*M[1
40]+M[106]*M[171]+M[107]*M[141]+M[107]*M[172]+M[108]*M[142]+M[108]*M[173]+M[
109]*M[143]+M[109]*M[174]+M[110]*M[144]+M[110]*M[175]+M[111]*M[145]+M[111]*M
[176]+M[112]*M[146]+M[112]*M[177]+M[113]*M[147]+M[113]*M[178]+M[114]*M[148]+
M[114]*M[179]+M[115]*M[149]+M[115]*M[180]+M[116]*M[150]+M[116]*M[181]+M[117]
*M[151]+M[117]*M[182]+M[118]*M[152]+M[118]*M[183]+M[119]*M[153]+M[119]*M[184
]+M[120]*M[154]+M[120]*M[185]+M[121]*M[155]+M[121]*M[186]+M[122]*M[156]+M[12
2]*M[187]+M[123]*M[157]+M[123]*M[188]+M[124]*M[158]+M[124]*M[189]+M[125]*M[1
59]+M[125]*M[190]+M[126]*M[160]+M[126]*M[191]+M[127]*M[161]+M[127]*M[192]+M[
128]*M[162]+M[128]*M[193]+M[129]*M[163]+M[129]*M[194]+M[130]*M[164]+M[130]*
M[195]+M[131]*M[165]+M[131]*M[196]+M[132]*M[166]+M[132]*M[197]+M[133]*M[167]
+M[133]*M[198]+M[134]*M[168]+M[135]*M[169]+M[136]*M[170]+M[137]*M[171]+M[13
8]*M[172]+M[139]*M[173]+M[140]*M[174]+M[141]*M[175]+M[142]*M[176]+M[143]*M[1
77]+M[144]*M[178]+M[145]*M[179]+M[146]*M[180]+M[147]*M[181]+M[148]*M[182]+M[
149]*M[183]+M[150]*M[184]+M[151]*M[185]+M[152]*M[186]+M[153]*M[187]+M[154]*
```

```
M[188]+M[155]*M[189]+M[156]*M[190]+M[157]*M[191]+M[158]*M[192]+M[159]*M[193]
+M[160]*M[194]+M[161]*M[195]+M[162]*M[196]+M[163]*M[197]+M[164]*M[198]+2);

   of = of +
abs(M[1]*M[34]+M[1]*M[67]+M[2]*M[35]+M[2]*M[68]+M[3]*M[36]+M[3]*M[69]+M[4]*
M[37]+M[4]*M[70]+M[5]*M[38]+M[5]*M[71]+M[6]*M[39]+M[6]*M[72]+M[7]*M[40]+M[7
]*M[73]+M[8]*M[41]+M[8]*M[74]+M[9]*M[42]+M[9]*M[75]+M[10]*M[43]+M[10]*M[76]+
M[11]*M[44]+M[11]*M[77]+M[12]*M[45]+M[12]*M[78]+M[13]*M[46]+M[13]*M[79]+M[1
4]*M[47]+M[14]*M[80]+M[15]*M[48]+M[15]*M[81]+M[16]*M[49]+M[16]*M[82]+M[17]*
M[50]+M[17]*M[83]+M[18]*M[51]+M[18]*M[84]+M[19]*M[52]+M[19]*M[85]+M[20]*M[5
3]+M[20]*M[86]+M[21]*M[54]+M[21]*M[87]+M[22]*M[55]+M[22]*M[88]+M[23]*M[56]+
M[23]*M[89]+M[24]*M[57]+M[24]*M[90]+M[25]*M[58]+M[25]*M[91]+M[26]*M[59]+M[2
6]*M[92]+M[27]*M[60]+M[27]*M[93]+M[28]*M[61]+M[28]*M[94]+M[29]*M[62]+M[29]*
M[95]+M[30]*M[63]+M[30]*M[96]+M[31]*M[64]+M[31]*M[97]+M[32]*M[65]+M[32]*M[9
8]+M[33]*M[66]+M[33]*M[99]+M[34]*M[67]+M[35]*M[68]+M[36]*M[69]+M[37]*M[70]+
M[38]*M[71]+M[39]*M[72]+M[40]*M[73]+M[41]*M[74]+M[42]*M[75]+M[43]*M[76]+M[4
4]*M[77]+M[45]*M[78]+M[46]*M[79]+M[47]*M[80]+M[48]*M[81]+M[49]*M[82]+M[50]*
M[83]+M[51]*M[84]+M[52]*M[85]+M[53]*M[86]+M[54]*M[87]+M[55]*M[88]+M[56]*M[8
9]+M[57]*M[90]+M[58]*M[91]+M[59]*M[92]+M[60]*M[93]+M[61]*M[94]+M[62]*M[95]+
M[63]*M[96]+M[64]*M[97]+M[65]*M[98]+M[66]*M[99]+M[100]*M[133]+M[100]*M[166]
+M[101]*M[134]+M[101]*M[167]+M[102]*M[135]+M[102]*M[168]+M[103]*M[136]+M[10
3]*M[169]+M[104]*M[137]+M[104]*M[170]+M[105]*M[138]+M[105]*M[171]+M[106]*M[1
39]+M[106]*M[172]+M[107]*M[140]+M[107]*M[173]+M[108]*M[141]+M[108]*M[174]+M[
109]*M[142]+M[109]*M[175]+M[110]*M[143]+M[110]*M[176]+M[111]*M[144]+M[111]*M
[177]+M[112]*M[145]+M[112]*M[178]+M[113]*M[146]+M[113]*M[179]+M[114]*M[147]+
M[114]*M[180]+M[115]*M[148]+M[115]*M[181]+M[116]*M[149]+M[116]*M[182]+M[117]
*M[150]+M[117]*M[183]+M[118]*M[151]+M[118]*M[184]+M[119]*M[152]+M[119]*M[185
]+M[120]*M[153]+M[120]*M[186]+M[121]*M[154]+M[121]*M[187]+M[122]*M[155]+M[12
2]*M[188]+M[123]*M[156]+M[123]*M[189]+M[124]*M[157]+M[124]*M[190]+M[125]*M[1
58]+M[125]*M[191]+M[126]*M[159]+M[126]*M[192]+M[127]*M[160]+M[127]*M[193]+M[
128]*M[161]+M[128]*M[194]+M[129]*M[162]+M[129]*M[195]+M[130]*M[163]+M[130]*
M[196]+M[131]*M[164]+M[131]*M[197]+M[132]*M[165]+M[132]*M[198]+M[133]*M[166]
+M[134]*M[167]+M[135]*M[168]+M[136]*M[169]+M[137]*M[170]+M[138]*M[171]+M[13
9]*M[172]+M[140]*M[173]+M[141]*M[174]+M[142]*M[175]+M[143]*M[176]+M[144]*M[1
77]+M[145]*M[178]+M[146]*M[179]+M[147]*M[180]+M[148]*M[181]+M[149]*M[182]+M[
150]*M[183]+M[151]*M[184]+M[152]*M[185]+M[153]*M[186]+M[154]*M[187]+M[155]*
M[188]+M[156]*M[189]+M[157]*M[190]+M[158]*M[191]+M[159]*M[192]+M[160]*M[193]
+M[161]*M[194]+M[162]*M[195]+M[163]*M[196]+M[164]*M[197]+M[165]*M[198]+2);

   of = of +
abs(M[1]*M[33]+M[1]*M[68]+M[2]*M[34]+M[2]*M[69]+M[3]*M[35]+M[3]*M[70]+M[4]*
M[36]+M[4]*M[71]+M[5]*M[37]+M[5]*M[72]+M[6]*M[38]+M[6]*M[73]+M[7]*M[39]+M[7
]*M[74]+M[8]*M[40]+M[8]*M[75]+M[9]*M[41]+M[9]*M[76]+M[10]*M[42]+M[10]*M[77]+
M[11]*M[43]+M[11]*M[78]+M[12]*M[44]+M[12]*M[79]+M[13]*M[45]+M[13]*M[80]+M[1
4]*M[46]+M[14]*M[81]+M[15]*M[47]+M[15]*M[82]+M[16]*M[48]+M[16]*M[83]+M[17]*
M[49]+M[17]*M[84]+M[18]*M[50]+M[18]*M[85]+M[19]*M[51]+M[19]*M[86]+M[20]*M[5
```

```
2]+M[20]*M[87]+M[21]*M[53]+M[21]*M[88]+M[22]*M[54]+M[22]*M[89]+M[23]*M[55]+
M[23]*M[90]+M[24]*M[56]+M[24]*M[91]+M[25]*M[57]+M[25]*M[92]+M[26]*M[58]+M[2
6]*M[93]+M[27]*M[59]+M[27]*M[94]+M[28]*M[60]+M[28]*M[95]+M[29]*M[61]+M[29]*
M[96]+M[30]*M[62]+M[30]*M[97]+M[31]*M[63]+M[31]*M[98]+M[32]*M[64]+M[32]*M[9
9]+M[33]*M[65]+M[34]*M[66]+M[35]*M[67]+M[36]*M[68]+M[37]*M[69]+M[38]*M[70]+
M[39]*M[71]+M[40]*M[72]+M[41]*M[73]+M[42]*M[74]+M[43]*M[75]+M[44]*M[76]+M[4
5]*M[77]+M[46]*M[78]+M[47]*M[79]+M[48]*M[80]+M[49]*M[81]+M[50]*M[82]+M[51]*
M[83]+M[52]*M[84]+M[53]*M[85]+M[54]*M[86]+M[55]*M[87]+M[56]*M[88]+M[57]*M[8
9]+M[58]*M[90]+M[59]*M[91]+M[60]*M[92]+M[61]*M[93]+M[62]*M[94]+M[63]*M[95]+
M[64]*M[96]+M[65]*M[97]+M[66]*M[98]+M[67]*M[99]+M[100]*M[132]+M[100]*M[167]
+M[101]*M[133]+M[101]*M[168]+M[102]*M[134]+M[102]*M[169]+M[103]*M[135]+M[10
3]*M[170]+M[104]*M[136]+M[104]*M[171]+M[105]*M[137]+M[105]*M[172]+M[106]*M[1
38]+M[106]*M[173]+M[107]*M[139]+M[107]*M[174]+M[108]*M[140]+M[108]*M[175]+M[
109]*M[141]+M[109]*M[176]+M[110]*M[142]+M[110]*M[177]+M[111]*M[143]+M[111]*M
[178]+M[112]*M[144]+M[112]*M[179]+M[113]*M[145]+M[113]*M[180]+M[114]*M[146]+
M[114]*M[181]+M[115]*M[147]+M[115]*M[182]+M[116]*M[148]+M[116]*M[183]+M[117]
*M[149]+M[117]*M[184]+M[118]*M[150]+M[118]*M[185]+M[119]*M[151]+M[119]*M[186
]+M[120]*M[152]+M[120]*M[187]+M[121]*M[153]+M[121]*M[188]+M[122]*M[154]+M[12
2]*M[189]+M[123]*M[155]+M[123]*M[190]+M[124]*M[156]+M[124]*M[191]+M[125]*M[1
57]+M[125]*M[192]+M[126]*M[158]+M[126]*M[193]+M[127]*M[159]+M[127]*M[194]+M[
128]*M[160]+M[128]*M[195]+M[129]*M[161]+M[129]*M[196]+M[130]*M[162]+M[130]*
M[197]+M[131]*M[163]+M[131]*M[198]+M[132]*M[164]+M[133]*M[165]+M[134]*M[166]
+M[135]*M[167]+M[136]*M[168]+M[137]*M[169]+M[138]*M[170]+M[139]*M[171]+M[14
```

```
0]*M[172]+M[141]*M[173]+M[142]*M[174]+M[143]*M[175]+M[144]*M[176]+M[145]*M[1
77]+M[146]*M[178]+M[147]*M[179]+M[148]*M[180]+M[149]*M[181]+M[150]*M[182]+M[
151]*M[183]+M[152]*M[184]+M[153]*M[185]+M[154]*M[186]+M[155]*M[187]+M[156]*
M[188]+M[157]*M[189]+M[158]*M[190]+M[159]*M[191]+M[160]*M[192]+M[161]*M[193]
+M[162]*M[194]+M[163]*M[195]+M[164]*M[196]+M[165]*M[197]+M[166]*M[198]+2);

  of = of +
abs(M[1]*M[42]+M[1]*M[59]+M[2]*M[43]+M[2]*M[60]+M[3]*M[44]+M[3]*M[61]+M[4]*
M[45]+M[4]*M[62]+M[5]*M[46]+M[5]*M[63]+M[6]*M[47]+M[6]*M[64]+M[7]*M[48]+M[7
]*M[65]+M[8]*M[49]+M[8]*M[66]+M[9]*M[50]+M[9]*M[67]+M[10]*M[51]+M[10]*M[68]+
M[11]*M[52]+M[11]*M[69]+M[12]*M[53]+M[12]*M[70]+M[13]*M[54]+M[13]*M[71]+M[1
4]*M[55]+M[14]*M[72]+M[15]*M[56]+M[15]*M[73]+M[16]*M[57]+M[16]*M[74]+M[17]*
M[58]+M[17]*M[75]+M[18]*M[59]+M[18]*M[76]+M[19]*M[60]+M[19]*M[77]+M[20]*M[6
1]+M[20]*M[78]+M[21]*M[62]+M[21]*M[79]+M[22]*M[63]+M[22]*M[80]+M[23]*M[64]+
M[23]*M[81]+M[24]*M[65]+M[24]*M[82]+M[25]*M[66]+M[25]*M[83]+M[26]*M[67]+M[2
6]*M[84]+M[27]*M[68]+M[27]*M[85]+M[28]*M[69]+M[28]*M[86]+M[29]*M[70]+M[29]*
M[87]+M[30]*M[71]+M[30]*M[88]+M[31]*M[72]+M[31]*M[89]+M[32]*M[73]+M[32]*M[9
0]+M[33]*M[74]+M[33]*M[91]+M[34]*M[75]+M[34]*M[92]+M[35]*M[76]+M[35]*M[93]+
M[36]*M[77]+M[36]*M[94]+M[37]*M[78]+M[37]*M[95]+M[38]*M[79]+M[38]*M[96]+M[3
9]*M[80]+M[39]*M[97]+M[40]*M[81]+M[40]*M[98]+M[41]*M[82]+M[41]*M[99]+M[42]*
M[83]+M[43]*M[84]+M[44]*M[85]+M[45]*M[86]+M[46]*M[87]+M[47]*M[88]+M[48]*M[8
9]+M[49]*M[90]+M[50]*M[91]+M[51]*M[92]+M[52]*M[93]+M[53]*M[94]+M[54]*M[95]+
M[55]*M[96]+M[56]*M[97]+M[57]*M[98]+M[58]*M[99]+M[100]*M[141]+M[100]*M[158]
```

```
+M[101]*M[142]+M[101]*M[159]+M[102]*M[143]+M[102]*M[160]+M[103]*M[144]+M[10
3]*M[161]+M[104]*M[145]+M[104]*M[162]+M[105]*M[146]+M[105]*M[163]+M[106]*M[1
47]+M[106]*M[164]+M[107]*M[148]+M[107]*M[165]+M[108]*M[149]+M[108]*M[166]+M[
109]*M[150]+M[109]*M[167]+M[110]*M[151]+M[110]*M[168]+M[111]*M[152]+M[111]*M
[169]+M[112]*M[153]+M[112]*M[170]+M[113]*M[154]+M[113]*M[171]+M[114]*M[155]+
M[114]*M[172]+M[115]*M[156]+M[115]*M[173]+M[116]*M[157]+M[116]*M[174]+M[117]
*M[158]+M[117]*M[175]+M[118]*M[159]+M[118]*M[176]+M[119]*M[160]+M[119]*M[177
]+M[120]*M[161]+M[120]*M[178]+M[121]*M[162]+M[121]*M[179]+M[122]*M[163]+M[12
2]*M[180]+M[123]*M[164]+M[123]*M[181]+M[124]*M[165]+M[124]*M[182]+M[125]*M[1
66]+M[125]*M[183]+M[126]*M[167]+M[126]*M[184]+M[127]*M[168]+M[127]*M[185]+M[
128]*M[169]+M[128]*M[186]+M[129]*M[170]+M[129]*M[187]+M[130]*M[171]+M[130]*
M[188]+M[131]*M[172]+M[131]*M[189]+M[132]*M[173]+M[132]*M[190]+M[133]*M[174]
+M[133]*M[191]+M[134]*M[175]+M[134]*M[192]+M[135]*M[176]+M[135]*M[193]+M[13
6]*M[177]+M[136]*M[194]+M[137]*M[178]+M[137]*M[195]+M[138]*M[179]+M[138]*M[1
96]+M[139]*M[180]+M[139]*M[197]+M[140]*M[181]+M[140]*M[198]+M[141]*M[182]+M[
142]*M[183]+M[143]*M[184]+M[144]*M[185]+M[145]*M[186]+M[146]*M[187]+M[147]*
M[188]+M[148]*M[189]+M[149]*M[190]+M[150]*M[191]+M[151]*M[192]+M[152]*M[193]
+M[153]*M[194]+M[154]*M[195]+M[155]*M[196]+M[156]*M[197]+M[157]*M[198]+2);

  of = of +
abs(M[1]*M[41]+M[1]*M[60]+M[2]*M[42]+M[2]*M[61]+M[3]*M[43]+M[3]*M[62]+M[4]*
M[44]+M[4]*M[63]+M[5]*M[45]+M[5]*M[64]+M[6]*M[46]+M[6]*M[65]+M[7]*M[47]+M[7
]*M[66]+M[8]*M[48]+M[8]*M[67]+M[9]*M[49]+M[9]*M[68]+M[10]*M[50]+M[10]*M[69]+
```

M[11]*M[51]+M[11]*M[70]+M[12]*M[52]+M[12]*M[71]+M[13]*M[53]+M[13]*M[72]+M[1
4]*M[54]+M[14]*M[73]+M[15]*M[55]+M[15]*M[74]+M[16]*M[56]+M[16]*M[75]+M[17]*
M[57]+M[17]*M[76]+M[18]*M[58]+M[18]*M[77]+M[19]*M[59]+M[19]*M[78]+M[20]*M[6
0]+M[20]*M[79]+M[21]*M[61]+M[21]*M[80]+M[22]*M[62]+M[22]*M[81]+M[23]*M[63]+
M[23]*M[82]+M[24]*M[64]+M[24]*M[83]+M[25]*M[65]+M[25]*M[84]+M[26]*M[66]+M[2
6]*M[85]+M[27]*M[67]+M[27]*M[86]+M[28]*M[68]+M[28]*M[87]+M[29]*M[69]+M[29]*
M[88]+M[30]*M[70]+M[30]*M[89]+M[31]*M[71]+M[31]*M[90]+M[32]*M[72]+M[32]*M[9
1]+M[33]*M[73]+M[33]*M[92]+M[34]*M[74]+M[34]*M[93]+M[35]*M[75]+M[35]*M[94]+
M[36]*M[76]+M[36]*M[95]+M[37]*M[77]+M[37]*M[96]+M[38]*M[78]+M[38]*M[97]+M[3
9]*M[79]+M[39]*M[98]+M[40]*M[80]+M[40]*M[99]+M[41]*M[81]+M[42]*M[82]+M[43]*
M[83]+M[44]*M[84]+M[45]*M[85]+M[46]*M[86]+M[47]*M[87]+M[48]*M[88]+M[49]*M[8
9]+M[50]*M[90]+M[51]*M[91]+M[52]*M[92]+M[53]*M[93]+M[54]*M[94]+M[55]*M[95]+
M[56]*M[96]+M[57]*M[97]+M[58]*M[98]+M[59]*M[99]+M[100]*M[140]+M[100]*M[159]
+M[101]*M[141]+M[101]*M[160]+M[102]*M[142]+M[102]*M[161]+M[103]*M[143]+M[10
3]*M[162]+M[104]*M[144]+M[104]*M[163]+M[105]*M[145]+M[105]*M[164]+M[106]*M[1
46]+M[106]*M[165]+M[107]*M[147]+M[107]*M[166]+M[108]*M[148]+M[108]*M[167]+M[
109]*M[149]+M[109]*M[168]+M[110]*M[150]+M[110]*M[169]+M[111]*M[151]+M[111]*M
[170]+M[112]*M[152]+M[112]*M[171]+M[113]*M[153]+M[113]*M[172]+M[114]*M[154]+
M[114]*M[173]+M[115]*M[155]+M[115]*M[174]+M[116]*M[156]+M[116]*M[175]+M[117]
*M[157]+M[117]*M[176]+M[118]*M[158]+M[118]*M[177]+M[119]*M[159]+M[119]*M[178
]+M[120]*M[160]+M[120]*M[179]+M[121]*M[161]+M[121]*M[180]+M[122]*M[162]+M[12
2]*M[181]+M[123]*M[163]+M[123]*M[182]+M[124]*M[164]+M[124]*M[183]+M[125]*M[1
65]+M[125]*M[184]+M[126]*M[166]+M[126]*M[185]+M[127]*M[167]+M[127]*M[186]+M[

```
128]*M[168]+M[128]*M[187]+M[129]*M[169]+M[129]*M[188]+M[130]*M[170]+M[130]*
M[189]+M[131]*M[171]+M[131]*M[190]+M[132]*M[172]+M[132]*M[191]+M[133]*M[173]
+M[133]*M[192]+M[134]*M[174]+M[134]*M[193]+M[135]*M[175]+M[135]*M[194]+M[13
6]*M[176]+M[136]*M[195]+M[137]*M[177]+M[137]*M[196]+M[138]*M[178]+M[138]*M[1
97]+M[139]*M[179]+M[139]*M[198]+M[140]*M[180]+M[141]*M[181]+M[142]*M[182]+M[
143]*M[183]+M[144]*M[184]+M[145]*M[185]+M[146]*M[186]+M[147]*M[187]+M[148]*
M[188]+M[149]*M[189]+M[150]*M[190]+M[151]*M[191]+M[152]*M[192]+M[153]*M[193]
+M[154]*M[194]+M[155]*M[195]+M[156]*M[196]+M[157]*M[197]+M[158]*M[198]+2);

  of = of +
abs(M[1]*M[40]+M[1]*M[61]+M[2]*M[41]+M[2]*M[62]+M[3]*M[42]+M[3]*M[63]+M[4]*
M[43]+M[4]*M[64]+M[5]*M[44]+M[5]*M[65]+M[6]*M[45]+M[6]*M[66]+M[7]*M[46]+M[7
]*M[67]+M[8]*M[47]+M[8]*M[68]+M[9]*M[48]+M[9]*M[69]+M[10]*M[49]+M[10]*M[70]+
M[11]*M[50]+M[11]*M[71]+M[12]*M[51]+M[12]*M[72]+M[13]*M[52]+M[13]*M[73]+M[1
4]*M[53]+M[14]*M[74]+M[15]*M[54]+M[15]*M[75]+M[16]*M[55]+M[16]*M[76]+M[17]*
M[56]+M[17]*M[77]+M[18]*M[57]+M[18]*M[78]+M[19]*M[58]+M[19]*M[79]+M[20]*M[5
9]+M[20]*M[80]+M[21]*M[60]+M[21]*M[81]+M[22]*M[61]+M[22]*M[82]+M[23]*M[62]+
M[23]*M[83]+M[24]*M[63]+M[24]*M[84]+M[25]*M[64]+M[25]*M[85]+M[26]*M[65]+M[2
6]*M[86]+M[27]*M[66]+M[27]*M[87]+M[28]*M[67]+M[28]*M[88]+M[29]*M[68]+M[29]*
M[89]+M[30]*M[69]+M[30]*M[90]+M[31]*M[70]+M[31]*M[91]+M[32]*M[71]+M[32]*M[9
2]+M[33]*M[72]+M[33]*M[93]+M[34]*M[73]+M[34]*M[94]+M[35]*M[74]+M[35]*M[95]+
M[36]*M[75]+M[36]*M[96]+M[37]*M[76]+M[37]*M[97]+M[38]*M[77]+M[38]*M[98]+M[3
9]*M[78]+M[39]*M[99]+M[40]*M[79]+M[41]*M[80]+M[42]*M[81]+M[43]*M[82]+M[44]*
```

```
M[83]+M[45]*M[84]+M[46]*M[85]+M[47]*M[86]+M[48]*M[87]+M[49]*M[88]+M[50]*M[8
9]+M[51]*M[90]+M[52]*M[91]+M[53]*M[92]+M[54]*M[93]+M[55]*M[94]+M[56]*M[95]+
M[57]*M[96]+M[58]*M[97]+M[59]*M[98]+M[60]*M[99]+M[100]*M[139]+M[100]*M[160]
+M[101]*M[140]+M[101]*M[161]+M[102]*M[141]+M[102]*M[162]+M[103]*M[142]+M[10
3]*M[163]+M[104]*M[143]+M[104]*M[164]+M[105]*M[144]+M[105]*M[165]+M[106]*M[1
45]+M[106]*M[166]+M[107]*M[146]+M[107]*M[167]+M[108]*M[147]+M[108]*M[168]+M[
109]*M[148]+M[109]*M[169]+M[110]*M[149]+M[110]*M[170]+M[111]*M[150]+M[111]*M
[171]+M[112]*M[151]+M[112]*M[172]+M[113]*M[152]+M[113]*M[173]+M[114]*M[153]+
M[114]*M[174]+M[115]*M[154]+M[115]*M[175]+M[116]*M[155]+M[116]*M[176]+M[117]
*M[156]+M[117]*M[177]+M[118]*M[157]+M[118]*M[178]+M[119]*M[158]+M[119]*M[179
]+M[120]*M[159]+M[120]*M[180]+M[121]*M[160]+M[121]*M[181]+M[122]*M[161]+M[12
2]*M[182]+M[123]*M[162]+M[123]*M[183]+M[124]*M[163]+M[124]*M[184]+M[125]*M[1
64]+M[125]*M[185]+M[126]*M[165]+M[126]*M[186]+M[127]*M[166]+M[127]*M[187]+M[
128]*M[167]+M[128]*M[188]+M[129]*M[168]+M[129]*M[189]+M[130]*M[169]+M[130]*
M[190]+M[131]*M[170]+M[131]*M[191]+M[132]*M[171]+M[132]*M[192]+M[133]*M[172]
+M[133]*M[193]+M[134]*M[173]+M[134]*M[194]+M[135]*M[174]+M[135]*M[195]+M[13
6]*M[175]+M[136]*M[196]+M[137]*M[176]+M[137]*M[197]+M[138]*M[177]+M[138]*M[1
98]+M[139]*M[178]+M[140]*M[179]+M[141]*M[180]+M[142]*M[181]+M[143]*M[182]+M[
144]*M[183]+M[145]*M[184]+M[146]*M[185]+M[147]*M[186]+M[148]*M[187]+M[149]*
M[188]+M[150]*M[189]+M[151]*M[190]+M[152]*M[191]+M[153]*M[192]+M[154]*M[193]
+M[155]*M[194]+M[156]*M[195]+M[157]*M[196]+M[158]*M[197]+M[159]*M[198]+2);
  return of
```

```
'''
Section 4: Population testing
Description: Find the fittest member of the new population. If this binary vector minimizes the
OF, we stop looking.
Parameters: population = the next generation
        mode = the OF to be tested
        n = the size of the binary vectors divided by two, used for dj, rb, and hf input decoding
Returns:    fittest = the fittest binary vector in the population
        fittestObj = the objective value of that binary vector
'''
def reportFittest(population, mode, n):
    # returns the binary encoding and the OF value of the fittest member of the current gen
    fittest = population[0]
    fittestObj = objectiveFunction(fittest, mode, n)
    for member in population:
        objTemp = objectiveFunction(member, mode, n)
        if objTemp < fittestObj:
            fittest = member
            fittestObj = objTemp
    return fittest, fittestObj


'''
```

```
Section 5: File Output

Description:    Output arrays are arrays of strings where each string will be printed to file.

        fileOutput corresponds to summary.txt, while the others all correspond to their

respective OF's txt file.

Parameters:     A summarized output array for all test OFs

        An output array for each test OF containing each line of execution output

Returns:    None (Files are written to)

'''


fileOutput = []

djOutput = []

rbOutput = []

hbOutput = []

twoFiveOutput = []

twoNineOutput = []

nineNineOutput = []


def printFile(f, strList):

  for line in strList:

    f.write(line)

    f.write("\n")

  return
```

```
def printToFile(fileOutput, djOutput, rbOutput, hbOutput, twoFiveOutput, twoNineOutput,
nineNineOutput):

    f = open("summary.txt", "w")
    printFile(f, fileOutput)
    f.close()

    f = open("dj.txt", "w")
    printFile(f, djOutput)
    f.close()

    f = open("rb.txt", "w")
    printFile(f, rbOutput)
    f.close()

    f = open("hb.txt", "w")
    printFile(f, hbOutput)
    f.close()

    f = open("25.txt", "w")
    printFile(f, twoFiveOutput)
    f.close()
    f = open("29.txt", "w")

    printFile(f, twoNineOutput)

    f.close()


    f = open("99.txt", "w")

    printFile(f, nineNineOutput)

    f.close()

    return



'''

Section 6: Main Control


For each of the test OFs:

    Do while global min not found:

        reproduction()

        crossover()

        mutation()

        check if global minimum found



Calls function to print to file afterwards
```

```
Note: De Jong and Rosenbrock OFs can accept higher dimensional inputs.

Each coordinate value requires 16 bits, so increase the multiple of 16 in VECTORLENGTH to

try this. This will significantly impact computation time, esp. on rb.

'''

print("-------")

print("DE JONG")

print("-------")

fileOutput.append("-------")

fileOutput.append("DE JONG")

fileOutput.append("-------")

djOutput.append("-------")

djOutput.append("DE JONG")

djOutput.append("-------")

POPSIZE = 16

VECTORLENGTH = 2 * 16
```

```
fileOutput.append("Population Size = " + str(POPSIZE))
fileOutput.append("Vector Length = " + str(VECTORLENGTH))

djOutput.append("Population Size = " + str(POPSIZE))
djOutput.append("Vector Length = " + str(VECTORLENGTH))

population = generateRandomPopulation(POPSIZE, VECTORLENGTH)
fittestObj = -1
genCount = 0
while(fittestObj == -1 or fittestObj != 0): # Global Miniumum of De Jong Sphere Function = 0 at
(0,0,...,0)
    genCount += 1
    population = reproduction(population, 1, VECTORLENGTH // 2)
    population = crossover(population, 1) # Pair up members of tentative pop and crossover all
pairs
    population = mutation(population, 1) # Mutate 50% of new population members
    fittest, fittestObj = reportFittest(population, 1, VECTORLENGTH // 2)
    print("Fittest member of gen " + str(genCount) + " is: "
     + fittest + " with objective function value of: " + str(fittestObj))
    djOutput.append("Fittest member of gen " + str(genCount) + " is: "
     + fittest + " with objective function value of: " + str(fittestObj))

fileOutput.append("Fittest member of gen " + str(genCount) + " is: "
 + fittest + " with objective function value of: " + str(fittestObj))



print("----------")

print("ROSENBROCK")

print("----------")


fileOutput.append("----------")

fileOutput.append("ROSENBROCK")

fileOutput.append("----------")


rbOutput.append("----------")

rbOutput.append("ROSENBROCK")

rbOutput.append("----------")


POPSIZE = 16

VECTORLENGTH = 2 * 16


fileOutput.append("Population Size = " + str(POPSIZE))

fileOutput.append("Vector Length = " + str(VECTORLENGTH))


rbOutput.append("Population Size = " + str(POPSIZE))

rbOutput.append("Vector Length = " + str(VECTORLENGTH))
```

```
population = generateRandomPopulation(POPSIZE, VECTORLENGTH)
fittestObj = -1
genCount = 0
resets = 0
while(fittestObj == -1 or fittestObj > 0.01):  # Global Miniumum of Rosenbrock Valley Function
= 0 at (1,1,...,1)
    genCount += 1
    population = reproduction(population, 2, VECTORLENGTH // 2)
    population = crossover(population, 1) # Crossover 100% of pairs
    population = mutation(population, 1) # Mutate 100% of new population members
    lastFittestObj = fittestObj
    fittest, fittestObj = reportFittest(population, 2, VECTORLENGTH // 2)
    rbOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective
function value of: " + str(fittestObj))
    if genCount % 25 == 0 or fittestObj <= 0.01:
        print("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective function
value of: " + str(fittestObj))
    # Break out if stuck

    if (fittestObj > 0.01 and abs(lastFittestObj - fittestObj) < 0.0001):
        resets += 1
        print("Stuck, resetting population.")
    rbOutput.append("Stuck, resetting population.")
    population = generateRandomPopulation(POPSIZE, VECTORLENGTH)

rbOutput.append("Number of resets: " + str(resets))
fileOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective
function value of: " + str(fittestObj))
fileOutput.append("Number of resets: " + str(resets))

print("----------")
print("HIMMELBLAU")
print("----------")

fileOutput.append("----------")
fileOutput.append("HIMMELBLAU")
fileOutput.append("----------")

hbOutput.append("----------")
hbOutput.append("HIMMELBLAU")
hbOutput.append("----------")

POPSIZE = 16
VECTORLENGTH = 2 * 16
```

```
fileOutput.append("Population Size = " + str(POPSIZE))
fileOutput.append("Vector Length = " + str(VECTORLENGTH))
hbOutput.append("Population Size = " + str(POPSIZE))
hbOutput.append("Vector Length = " + str(VECTORLENGTH))

population = generateRandomPopulation(POPSIZE, VECTORLENGTH)
fittestObj = -1
genCount = 0
resets = 0
while(fittestObj == -1 or fittestObj > 0.01):  # Global Minima of Himmelblau Function = 0 at:
    # (3, 2)
    # (-2.805118, 3.131312)
    # (-3.779310, -3.283186)
    # (3.584428, -1.848126)
    genCount += 1
    population = reproduction(population, 3, VECTORLENGTH // 2)
    population = crossover(population, 1.00) # Crossover 100% of pairs
    population = mutation(population, 1.00) # Mutate 100% of new population members
    lastFittestObj = fittestObj
    fittest, fittestObj = reportFittest(population, 3, VECTORLENGTH // 2)
    hbOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective
function value of: " + str(fittestObj))
    if (genCount % 25 == 0) or (fittestObj <= 0.01):
        print("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective function
value of: " + str(fittestObj))
    # Break out if stuck
    if (fittestObj > 0.01 and abs(lastFittestObj - fittestObj) < 0.0001):
        resets += 1
        print("Stuck, resetting population.")
        hbOutput.append("Stuck, resetting population.")
        population = generateRandomPopulation(POPSIZE, VECTORLENGTH)

hbOutput.append("Number of resets: " + str(resets))
fileOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective
function value of: " + str(fittestObj))
fileOutput.append("Number of resets: " + str(resets))


print("----------")
print("2CCOF.25.C")
print("----------")




fileOutput.append("----------")
fileOutput.append("2CCOF.25.C")
fileOutput.append("----------")
```

```
twoFiveOutput.append("----------")
twoFiveOutput.append("2CCOF.25.C")
twoFiveOutput.append("----------")


POPSIZE = 16
VECTORLENGTH = 2 * 25 + 1


fileOutput.append("Population Size = " + str(POPSIZE))
fileOutput.append("Vector Length = " + str(VECTORLENGTH))


twoFiveOutput.append("Population Size = " + str(POPSIZE))
twoFiveOutput.append("Vector Length = " + str(VECTORLENGTH))


population = generateRandomPopulation(POPSIZE, VECTORLENGTH)
fittestObj = -1
genCount = 0
while(fittestObj == -1 or fittestObj > 25 - 1): # Global Minimum of 2CCOF.25 = 24
    genCount += 1
    population = reproduction(population, 25, VECTORLENGTH // 2)
    population = crossover(population, 1.00) # Crossover 100% of pairs
    population = mutation(population, 1.00) # Mutate 100% of new population members
    lastFittestObj = fittestObj
    fittest, fittestObj = reportFittest(population, 25, VECTORLENGTH // 2)
    twoFiveOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with
objective function value of: " + str(fittestObj))
    if (genCount % 25 == 0) or (fittestObj <= 25 - 1):
        print("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective function
value of: " + str(fittestObj))
fileOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective
function value of: " + str(fittestObj))


print("----------")
print("2CCOF.29.C")
print("----------")


fileOutput.append("----------")
fileOutput.append("2CCOF.29.C")
fileOutput.append("----------")


twoNineOutput.append("----------")
twoNineOutput.append("2CCOF.29.C")
twoNineOutput.append("----------")


POPSIZE = 16
VECTORLENGTH = 2 * 29 + 1
```

```
fileOutput.append("Population Size = " + str(POPSIZE))
fileOutput.append("Vector Length = " + str(VECTORLENGTH))


twoNineOutput.append("Population Size = " + str(POPSIZE))
twoNineOutput.append("Vector Length = " + str(VECTORLENGTH))


population = generateRandomPopulation(POPSIZE, VECTORLENGTH)
fittestObj = -1
genCount = 0
while(fittestObj == -1 or fittestObj > 29 -1): # Global Minimum of 2CCOF.29 = 28
    genCount += 1
    population = reproduction(population, 29, VECTORLENGTH // 2)
    population = crossover(population, 1.00) # Crossover 100% of pairs
    population = mutation(population, 1.00) # Mutate 100% of new population members
    lastFittestObj = fittestObj
    fittest, fittestObj = reportFittest(population, 29, VECTORLENGTH // 2)
    twoNineOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with
objective function value of: " + str(fittestObj))
    if (genCount % 25 == 0) or (fittestObj <= 29 -1):
        print("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective function
value of: " + str(fittestObj))
fileOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective
function value of: " + str(fittestObj))
```

```
print("----------")

print("2CCOF.99.C")

print("----------")




fileOutput.append("----------")

fileOutput.append("2CCOF.99.C")

fileOutput.append("----------")


nineNineOutput.append("----------")

nineNineOutput.append("2CCOF.99.C")

nineNineOutput.append("----------")


POPSIZE = 16

VECTORLENGTH = 2 * 99 + 1


fileOutput.append("Population Size = " + str(POPSIZE))

fileOutput.append("Vector Length = " + str(VECTORLENGTH))


nineNineOutput.append("Population Size = " + str(POPSIZE))

nineNineOutput.append("Vector Length = " + str(VECTORLENGTH))
```

```
population = generateRandomPopulation(POPSIZE, VECTORLENGTH)
fittestObj = -1
genCount = 0
while(fittestObj == -1 or fittestObj > 99 -1):  # Global Minimum of 2CCOF.99 = 98
    genCount += 1
    population = reproduction(population, 99, VECTORLENGTH // 2)
    population = crossover(population, 1.00) # Crossover 100% of pairs
    population = mutation(population, 1.00) # Mutate 100% of new population members
    lastFittestObj = fittestObj
    fittest, fittestObj = reportFittest(population, 99, VECTORLENGTH // 2)
    nineNineOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with
objective function value of: " + str(fittestObj))
    if (genCount % 25 == 0) or (fittestObj <= 99 -1):
        print("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective function
value of: " + str(fittestObj))
fileOutput.append("Fittest member of gen " + str(genCount) + " is: " + fittest + " with objective
function value of: " + str(fittestObj))
printToFile(fileOutput, djOutput, rbOutput, hbOutput, twoFiveOutput, twoNineOutput,
nineNineOutput)
```