

1 . An e-commerce website wishes to find the lucky customer who will be eligible for full value cash back. For this purpose, a number N is fed to the system. It will return another number that is calculated by an algorithm. In the algorithm, a sequence is generated, in which each number is the sum of the two preceding numbers. Initially the sequence will have two 1's in it. The system will return the N^{th} number from the generated sequence which is treated as the order ID. The lucky customer will be the one who has placed that order. Write an algorithm to help the website find the lucky customer.

Input

The input consists of an integer token, representing the number fed to the system (N).

Output

Print an integer representing the order ID of the lucky customer.

Example

Input:

8

Output:

21

Explanation:

The sequence generated by the system will be 1,1,2,3,5,8,13,21. The 8th number in the sequence is 21. The lucky customer is the one who has placed the order with order ID 21.

Test case 1:

Input:

8

Expected Return Value:

21

Test case 2:

Input:

7

Expected Return Value:

13

2 . A company provides network encryption for secure data transfer. The data string is encrypted prior to transmission and gets decrypted at the receiving end. But due to some technical error, the encrypted data is lost and the received string is different from the original string by 1 character. Arnold, a network administrator, is tasked with finding the character that got lost in the network so that the bug does not harm other data that is being transferred through the network.

Write an algorithm to help Arnold find the character that was missing at the receiving end but present at the sending end.

Input

The input consists of two space-separated strings – *stringSent* and *stringRec*, representing the string that was sent through the network, and the string that was received at the receiving end of the network, respectively.

Output:

Print a character representing the character that was lost in the network during transmission and if there is no data loss during transmission then print "NA".

Example**Input:**

abcdfjgerjabcdfijger

Output:

J

Explanation:

The character 'j' at the end of the sent string was lost in the network during transmission.

Test case 1:

Input:

abcdfjgerj

abcdfjger

Expected Return Value:

J

Test case 2:

Input:

aaaaaabaa

Aaaaaaaa

Expected Return Value:

b

3 . An e-commerce company plans to give their customers a discount for the New Years holiday. The discount will be calculated on the basis of the bill amount of the order placed. The discount amount is the sum of all the odd digits ion the customer's total bill amount. If no odd digit is present in the bill amount, then the discount will be zero.

Write an algorithm to find the discount for the given total bill amount.

Input

The input consists of an integer *billAmount*, representing the customer's total bill amount.

Output

Print an integer representing the discount for the given total bill amount

Constraints

$0 < \text{billAmount} \leq 10^9$

Example**Input:**

2514795

Output

27

Explanation:

Odd digits in the given number 2514795 are 5, 1, 7, 9, 5. The sum of these odd digits is 27.

So, the output is 27.

4. A company has launched a new text editor that allows users to enter English letters, numbers and whitespaces only. If a user attempts to enter any other type of character, it is counted as a miss.

Given a string of text, write an algorithm to help the developer detect the number of misses by a given user in the given input.

Input

The input consists of a string *textInput*, representing the text that is entered in the text editor by the user.

Output

Print an integer representing the number of misses by a given user in the given input.

Example**Input:**

aa a234bc@ sad\$ hsagd^

Output:

3

Explanation:

The characters that are counted as misses by the editor are ['@','\$', '^']

5. A company has a sales record of N products for M days. The company wishes to know the maximum revenue received from a given product of the N products each day. Write an algorithm to find the highest revenue received each day.

Input

The first line of the input consists of two space-separated Integers-days (M) and products(N), representing the days and the products in the sales record.

The next M lines consist of N space-separated integers representing the sales revenue received from each product each day.

Output

Print M space-separated integers representing the maximum received each day.

Example**Input**

34

100 198 333 323

122 232 221 111

223 565 245 764

Output:

333 232 764

Explanation:

The maximum revenue received on the first day is 333, followed by a maximum revenue of 232 on the second day and a maximum revenue of 764 on the third day.

TESTCASES**TestCase1:****Input:**

4 4
7 21 2 8
8 18 16
16 12 97
12 0 7 2

Expected Return Value:

21 18 16 12

Testase2:**Input:**

3 3
98 -321 83
83 54 -75
283 46 68

Expected Return Value:

98 83 283

6. You are playing an online game. In the game, a number is displayed on the screen. In order to win the game, you have to Count the trailing zeros in the factorial value of the given number. Write an algorithm to count the trailing zeros in the factorial value of the given number.

Input

The input consists of an integer *num*, representing the number displayed on the screen.

Output

Print An integer representing the count of trailing zeros in the factorial of the given numbers.

Note

The factorial of the number is calculated as the product of integer numbers from 1 to *num*.

Example

Input

5

Output:

1

Explanation:

On calculating the factorial of 5, the output is 120 (1 x 2 x 3 x 4 x 5). There is only one trailing 0 in 120, So the output is 1.

7. In a science research lab, the combination of two nuclear substances produces an initial energy *A*. This energy *A* changes at a consistent rate *R* every second. The energy gets multiplied by a constant value *R* every second. The scientist wishes to calculate the energy produced at every second if the reaction is allowed to happen for *N* seconds.

Write an algorithm to find the energy produced at every second if the reaction is allowed to happen for *N* seconds.

Input

The input consists of three space-separated integers –*intialEnergy*, rate and time. representing the initial energy produced on combining the nuclear substances (A), the consistent rate of change (R), and the seconds for which the reaction is allowed to happen (N), respectively.

Output

Print N space-separated integers representing the energy produced at every second if the reaction is allowed to happen for N seconds.

Constraints

$-10^6 \leq \text{intialEnergy}, \text{rate} \leq 10^6$

$0 \leq \text{time} \leq 100$

Example

Input

5 3 3

Output:

5 15 45

Explanation:

For N =1, an initial energy of 5 is generated

For N=2, a consistent rate of 3 is multiplied to it, so it becomes 15

For N=3, again 3 is multiplied to the previous energy value, so it becomes 45.

So the out is 5, 15, 45

TEST CASES:

TestCase1:

Status:

Wrong

Expected

2 8 32

Returned :

Enter values 2824

TestCase2:

Status:

Wrong

Expected

2 12 72 432 2592

Returned :

enter values 21260

There are some more test-cases which will be checked only after above cases pass.

8. Andrew is a stock trader who trades in N selected stocks. He has calculated the relative stock price changes in the N stocks from the previous day stock prices. Now, his lucky number is K , so he wishes to invest in the particular stock that has K th smallest relative stock value.

Write an algorithm for Andrew to find the K th smallest stock price out of the selected N stocks.

Input

The first line of the input consists of two space-separated integers – *numOfStocks* and *valuek*, representing the number of selected stocks (N) And the value K for which he wishes to find the stock price, respectively.

The second line consists of N space-separated integers – stock1, stock2,, stock N representing the relative stock prices of the selected stocks.

Output

Print an integer representing the Kth smallest stock price of selected N stocks.

Constraints

$$0 < \text{valueK} \leq \text{numOfStocks} \leq 10^6$$

$$0 \leq \text{stock}_i \leq 10^6$$

$$0 \leq i < \text{numOfStocks}$$

Example

Input:

7 5

9 -3 8 -6 -7 18 10

Output

9

Explanation:

The sorted relative stock prices are [-7, -6, -3, 8, 9, 10, 18]

So, the 5th smallest stock price is 9.

TEST CASES

Test Cases1:

Input:

7 4

1 2 3 4 5 7 9

Expected Return Value:

4

Test Cases2:

Input:

5 3

10 5 7 88 19

Expected Return Value:

10

9. An e-commerce company is planning to give a special discount on all its product to its product to its customers for the Christmas holiday.

The company possesses data on its stock of N product types. The data for each product type represents the count of customers who have ordered the given product. If the data K is positive then it shows that the product has been ordered by K customers and is in stock. If the data K is negative then it shows that it has been ordered by K customers but is not in stock. The company will fulfill the order directly if the ordered product is in stock. If it is not in stock, then the company will fulfill the order after they replenish the stock from the warehouse. They are planning to offer a discount amount A for each product. The discount value will be distributed to the customers who have purchased that selected product. The discount will be distributed only if the decided amount A can be divided by the number of orders for a particular product.

Write an algorithm for the sales team to find the number of products out of N for which the discount will be distributed.

Input

The first line of the input consists of two space-separated integers – *numOfProducts* and *disAmount*, representing the number of different types of products (N) and the discount amount that will be distributed among the customers.

Order N representing the current status of the stock for the orders of the respective product types.

Output

Print an integer representing the number of products out of N for which the discount will be distributed.

Constraints

$$0 \leq \text{numOfProducts}, \text{disAmount} \leq 10^5$$

$$-10^6 \leq \text{order}_i \leq 10^6$$

$$0 \leq i \leq \text{numOfProducts}$$

Example**Input:**

7 18

9 – 13 8 – 7 – 8 18 10

Output

2

Explanation:

The product for which the number of customers will collect the discount amount “3” are for product types 0 and 5, i.e. 9 and 18, respectively. So, the output is 2

10 . Jackson, a math research student, is developing an application on triangles in mensuration. For the two triangles on the application’s display, with base and height given, the user must identify the triangle with the largest area. Jackson must now write an algorithm to find the area of the larger triangle.

To find the area of a triangle with base and height given, the following formula is used:

Area of a triangle = (base*height)/2.

Write an algorithm to find the area of the largest triangle.

Input

The first line of the input consists of two space-separated positive integers – base1, height1, representing the base and height of the first triangle.

The second line consists of two space-separated positive integers- base2, height2, representing the base and height of the second triangle.

Output

Print a real number representing the area of the largest triangle rounded up to 6 decimal places.

Constraints

$0 \leq \text{base1}, \text{height1}, \text{base2}, \text{height2} \leq 10^9$

Example**Input:**

5 8

4 11

Output:

22.000000

Explanation:

Area of the first triangle = $20.000000((5*8)/2)$.

Area of the second triangle = $22.000000((4*11)/2)$.

So, the output is 22.000000.

11. A company wishes to encode its data is in the form of a string and is case sensitive. They wish to encode the data with respect to a specific character. They wish to count the number of times the character reoccurs in the given data so that they can encode the data accordingly.

Write an algorithm to find the count of the specific character in the given data.

Input

The first line of the input consists of a string data representing the data to be encoded.

The next line of the input consists of a character coder representing the character to be counted in the data.

Output

Print an integer representing the count of the specific character.

Example**Input:**

haveagoodday

a

Output:

3

Explanation:

The character "a" occurs thrice in the data. So, the output is 3.

12. A company wishes to transmit data to another server. The data consists of numbers only. To secure the data during transmission, they plan to reverse the data first. Write an algorithm to reverse the data.

Input

The input consists of an integer data, representing the data to be transmitted.

Output

Print an integer representing the given data in reverse form.

Example**Input**

5783789

Output:

9873875

Explanation:

On reversing the given value, the output is 9873875.

13. A company wishes to provide cab service for their N employees. The employees have IDs ranging from 0 to N-1. The company has calculated the total distance from an employee's residence to the company, considering the path to be followed by the cab is a straight path. The distance of the company from itself is 0. The distance for the

employees who live to the left side of the company is represented with a negative sign. The distance for the employees who live to the right side of the company is represented with a positive sign. The cab will be allotted a range of distance. The company wishes to find the IDs of the employees who live within the particular distance range.

Write an algorithm to find the employee IDs who live within the distance range.

Input

The first line of the input consists of three space-separated integers- num, start and representing the size of the list (N); the starting value of the range, and the ending value of the range, respectively.

The second line of the input consists of N space-separated integers representing the distance of the employees from the company.

Output

Print space-separated integers representing the IDs of the employees whose distance lies within the given range else return -1.

Example

Input

```
6 30 50
29 38 12 48 39 55
```

Output

```
134
```

Explanation:

There are three employees with IDs 1, 3 and 4 whose distance from the office lies within the given range.

14. Mr. Woods, an electrician has made some faulty connections of eight street lights in Timberland city. The connections are such that if the

street lights adjacent to a particular light are both ON(represented as 1) or are both OFF (represented as 0),then that street light goes OFF the next night.Otherwise,it remains ON the next night.The two street lights at the end of the road have only a single adjacent street light,so the other adjacent light can be assumed to be always OFF.The state of the lights on a particular day is considered for the next day and not for the same day.

Due to this fault,the people of the city are facing difficulty in driving on the road at night.So,they have filed a complaint about this to the Head of the Federal Highway Administration.Based on this complaint the head has asked for the report of the state of street lights after M days.

Write an algorithm to output the state of the street lights after the given M days.

Input

The first line of the input consists of an integer-days, representing the number of days (M).

The next line consists of eight space-separated integers representing the current state of street lights i.e.either 0 or 1.

Output

Print eight space-separated integers representing the state of street lights after M days.

Constraints

$1 \leq \text{days} \leq 10^6$

Example

Input

2

11101111

Output:

00000110

Explanation:

The street light at position 0 has its neighboring street lights 0 (assumption) and 1. So, on the next day, it will be 1.

The street light at position 1 has both its neighboring street lights are 1. So, on the next day, it will be 0.

The street light at position 2 has one of its neighboring street lights is 0 and the other one is 1. So, on next day, it will be 1.

The street light at position 3 is 0 and both its neighboring street lights are 1. So, on next day, the street light at position 3 will be 0 only.

Similarly, we can find the state of the remaining street lights for the next day.

So, the state of street lights after first day is 101010001

After two days, the state of street lights is 00000110

15. The cloud computing company Cloud0 can accommodate various requirements for resources. The company system runs two servers. For load balancing purposes, the load of the resources gets transferred to the servers one by one. Initially, the first request goes to server 1, the next request goes to server 2, and so on. The requests served by the servers are two types i.e. one for memory deallocation (denoted by a negative number).

Write an algorithm to find the total number of units of memory allocated/deallocated by the server 1 after processing all the requests.

Input

The first line of the input consists of an integer numOfReq, representing the number of requests(N).

The second line consists of N space-separated integers- $req_1, req_2, \dots, req_N$ representing the requests for the allocation/deallocation of the respective memory units.

Output

Return an integer representing the total number of units of memory allocation/deallocated by the server 1 after processing all the requests.

Constraints

$0 \leq \text{numOfReq} \leq 10^5$

$-10^6 \leq req_i \leq 10^6$

$0 \leq i < \text{numOfReq}$

Example

Input

7

2-3-8-6-7181

Output

4

Explanation

The requests served by server 1 are [2,8,-7,1]

So, the total processing time of server 2 is 4.

TESTCASES:

TestCase1:

Input

5

14 53 2 23 1

Expected Return Value

17

TestCase2:

Input:

6

54 2 32 56 88 12

Expected Return Value:

16. A pizza shop makes vegan pizzas as well as meat based pizzas. The customers place N orders at the shop and their order number gets printed on their bill. The shop displays k out of N both-vegan and meat based pizza orders on their display screen at a single time. The pizza shop is very famous and receives many orders. So to avoid confusion, the vegan pizza orders are displayed as a positive order number and the meat based pizza orders are displayed as a negative order number. All the orders are delivered in the order in which they are displayed on the screen. Each time a displayed order is ready, it is then removed from the display screen and the next order is added to the display at the end. A couple has come to eat pizza with their child Billy. Billy is a very naughty child and to keep him busy, his parents tell him to make a list of the first meat based pizza order number present in each set of k orders displayed on the shop's display screen.

Write an algorithm to help Billy make a list of the first meat based pizza order numbers displayed on the screen each time an order is delivered to a customer.

Input

The first line of the input consists of two space-separated integers – `numOfOrders` and `size`, representing the total number of orders placed (N) and the number of orders displayed on the screen (K), respectively.

The second line consists of N space-separated integers representing the vegan pizza and meat based pizza order numbers of the orders placed by the customers.

Output

Print a list of space-separated integers representing the first meat based pizza order of every k orders displayed on the screen each time an order is delivered to a customer and print 0 if the screen does not display any meat based pizza order.

Constraints

$0 < _numOfOrders < 10^6$

$0 < _size < _numOfOrders$

$-10^9 < _ordersNum < 10^9$, where order Num represents the order numbers of the orders placed

Example**Input**

63

-11 -2 19 37 64 -18

Output:

-11 -2 0 -18

Explanation:

Step1: At the time of the first display, the order numbers displayed are [-11,-2,19].

So, the first displayed meat based pizza order number is -11.

Step2:At the time of the next display, the order numbers displayed are[-2,19,37]

So, the first displayed meat based pizza order number is -2.

Step3:At the time of the next display, the order numbers displayed are[19,37,64].

Since no meat based pizza order is displayed, the output is 0.

Step4:Similarly,at the time of the next display, the order numbers displayed are[37,64,-18].

So, the first displayed meat based pizza order number is -18.

So, the output is [-11, -2, 0,-18].

TESTCASE:**Testcase1:****Input:**

63

-11 -2 19 37 64 -18

Expected Return Value:

-42 -42 -56 -56

17. Write an algorithm to find the number of occurrences of needle in given positive number haystack.

Input

The first line of the input consists of an integer needle, representing a digit. The second line consists of an integer haystack, representing the positive number.

Output

Print an integer representing the number of occurrences of needle in haystack.

Constraints

$0 < \text{needle} < 9$

$0 < \text{haystack} < 999999999$

Example**Input:**

2

123228

Output:

3

Explanation:

Needle 2 is occurring 3 times in the haystack.

TESTCASE:**TestCase1:****Input:**

0

1025480

Expected Return Value:

2

TestCase2:

Input:

5

55555555

Expected Return Value:

8

18. A company Digicomparts manufactures 52 types of unique products for laptop and desktop computers. It manufactures 10 types of laptop products and 42 types of desktop products. Each product manufactured by the company has a unique product ID from a-z and A-Z. The laptop products have product IDs(a,i,e,o,u,A,I,E,O,U) while the rest of the product IDs are assigned to the desktop products. The company manager wishes to find the sales data for the desktop products.

Given a list of product IDs of the sales of the last N products. Write an algorithm to help the manager find the product IDs of the desktop products.

Input

The first line of the input consists of an integer numofproducts, representing the number of products to be considered in the sales data(N).

The second line consists of N space-separated characters-prodID₁,prodID₂....,prodID_N representing the productIDs of the sales of the last N products.

Output

Print an integer representing the number of desktop products among the given sales data.

Constraints

$0 < \text{numOfProducts} < 10^6$

Example

Input

6

A v l k e l

Output

3

Explanation:

The productIDs of the desktop products in the sales data are [v,k,l].
So, the output is 3.

19. Martin is working as a commander in the army. The secret agent working for the army has shared a secret information with him. The secret information consists of a text and name of terrorist. With the given information, Martin needs to find the number of terrorists who are going to attack the army. He also gave you a hint that the number of terrorists is the number of times the terrorist's name occurs in the text.

Write an algorithm to help Martin find the number of terrorists who are going to attack.

Input

The first line of the input consists of a string text, representing the text sent in the secret information shared by the secret agent.

The second line consists of a string name, representing the name of the terrorist.

Output

Print an integer representing the number of terrorists who are going to attack.

Note

The name matching is case insensitive.

Overlap can exist while searching the name of the terrorist in the text.

Example

Input

TimisplayinginthehouseofTimwiththetoysofTim
Tim

Output

3

Explanation:

Tim is occurring 3 times in the text of secret information.
Number of terrorists=3

TESTCASE:1:**Testase1:****Input:**

6

A v l k e l

Expected Return Value:

3

TestCase2:**Input:**

9

S d h a j m e k p

Expected Return Value:

7

20. Given a route in a straight line. N buses operate between various bus stations. There is workstation at the start of the route. The distance of the bus stations are calculated from the workstation. The

transportation authority wants to decrease the number of buses that run in the city so if the routes of the buses overlap, then all such buses are replaced by a single bus. The authority wants to find the number of buses after the replacement of buses on the overlapping routes.

Write an algorithm to find the number of buses after the replacement of buses on the overlapping routes.

Input

The first line of the input consists of an integer-busCount, representing the number of buses running on the route(N).

The next N lines consist of two space-separated integers representing the distance of starting and ending bus stations of N buses from the workstation.

Output

Print an integer representing the number of buses running on the route after the replacement of buses on overlapping routes.

Constraints

$0 < \text{busCount} < 1000$

$0 < \text{busStations}[i][0] < \text{busStations}[i][1] < 10^6$, busStations are the starting and ending bus stations of a bus.

$0 < i < \text{busCount}$

Example

Input

4

28

6 10

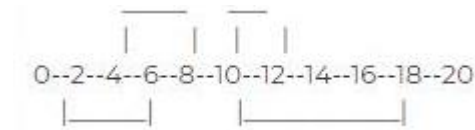
12 14

12 20

Output

2

Explanation:



The buses running between the bus stations [2,8] and [6,10] are combined to one.

Similarly, the buses running between the bus stations [12,14] and [12,20] are combined to one.

So, the total number of buses running on the route are 2.

21. You are playing an online game. In the game, a list of N numbers is given. The player has to arrange the numbers so that all the odd numbers of the list come after the even numbers. Write an algorithm to arrange the given list. Such that all the odd numbers of the list come after the even numbers.

Input

The first line of the input consists of an integer num, representing the size of the list (N).

The second line of the input consists of N space-separated integers representing the values of the list.

Output

Print N space-separated integers such that all the odd numbers of the list come after the even numbers.

Example

Input

8

10 98 12 22 3 33 21 11

Output:

10 98 12 22 3 33 21 11

Explanation:

All the even numbers are placed before all the odd numbers.

22. A company Selenia is planning a big sale at which they will give their customers a special promotional discount. Each customer that purchases a product from the company has a unique customer ID numbered from 0 to N-1. Andy, the marketing head of the company, has selected bill amounts of the N customers for the promotional scheme. The discount will be given to the customers whose bill amounts are perfect squares. The customers may use this discount on a future purchase.

Write an algorithm to help Andy find the number of customers that will be given discounts.

Input

The first line of the input consists of an integer numOfCust, representing the number of customers whose bills are selected for the promotional discount(N).

The second line consists of N space-separated integers-bill₁, bill₂..... ,bill_N representing the bill amounts of the N customers selected for the promotional discount.

Output

Print an integer representing the number of customers that will be given discounts.

Constraints $0 < \text{numOfCust} < 10^6$ $0 < \text{bill}_i < 10^6$ $0 < i < \text{numOfCust}$ **Example****Input**

6

25 77 54 81 48 34

Output:

2

Explanation:

The bill amounts that are perfect squares are 25 and 81.

So, the output is 2.

23. A cold storage company has N storage units for various products. The company has received N orders that must be preserved at respective N temperatures inside the storage units. The company manager wishes to identify which products must be preserved at negative temperatures.

Write an algorithm to help the manager find number of products that have negative temperature storage requirements.

Input

The first line of the input consists of an integer *numOfProducts*, representing the number of products (N).

The second line consists of N space-separated integers – $temp_1, temp_2, \dots, temp_N$ representing the temperatures at which the products must be preserved in the storage units.

Output

Print an integer representing the number of products that must be preserved at negative temperatures.

Constraints

$$0 \leq numOfProducts \leq 10^6$$

$$10^6 \leq temp_i \leq 10^6$$

$$0 \leq i < numOfProducts,$$

Example

Input

7 9 -3 8 -6 -7 8 10

Output

3

Explanation:

The products that must be preserved at negative temperatures are at indices [1,3,4] ie. [-3 -6 -7]

So, the output is

24 . You are given two lists of different lengths of positive integers. Write an algorithm to count the number of elements which are not common in the given list.

Input

The first line of the input consists of two space-separated integers – length 1 and length2, an integer representing the number of elements in the first list and the number of elements in the second list, respectively.

The second line consists of an integer representing the first list of positive integers.

The third line consists of an integer representing the second list of positive integers.

Output

Print a positive integer representing the count of elements which are not common in both the given lists.

Example

Input:

11 10

1 1 2 3 4 5 5 7 6 9 10

11 12 13 4 5 6 7 18 19 20

Output:

12

Explanation:

The numbers which are not common in both the lists are [1, 2, 3, 9, 10, 11, 12, 13, 18, 19, 20]

So, the output is 12.

25. You are given a list of integers and an integer K. Write an algorithm to find the number of elements in the list which are strictly less than K.

Input

The first line of the input consists of two space-separated integers – size and num K, representing the number of elements in the list (N) and the integer to be compared (K).

The second line consists of N space-separated integers- *elements[0]*, *elements[1]*, *Elements[N-1]* representing the list of integers.

Output

Print an integer representing the number of elements in the list which are strictly less than *num*.

Constraints

$-10^9 \leq \text{numK} < 10^9$

$-10^9 \leq \text{elements}[0], \text{elements}[1], \dots, \text{elements}[N-1] < 10^9$

Example**Input:**

7 5

1 7 4 5 6 3 2

Output:

4

Explanation:

The numbers which are less than 5 in elements are 1, 2, 3, 4, .

So, the output is 4

26. Consider a special function that is used to generate permutations of a given list of numbers. On each call, it returns one of the random permutation of the input list and it never repeats any permutation it has already generated in an earlier call. Once the function has generated all possible permutations, it simply returns NULL.

Write an algorithm, to figure out the maximum number of calls required to this special function to obtain an array which is sorted in ascending order.

The input to the function maxOperations consist of a non-empty integer array list and its length len. It return an integer representing the maximum number of calls ne special function to sort the array in ascending order.

Useful Commands:

new is used to dynamically allocate memory in C++. The statement-

```
int arr new - new intp[x];
```

testcase 1:**input**

[5,1,3,11],4

Excepted return value

23

Explanation

The following permutation can occur before the sorted array appears-

11,5,3,1

11,5,1,3

11,3,5,1

11,3,1,5

11,1,5,3

11,1,3,5 and so on.....

Testcase 2:

[5,1,2,3,8,0,12],7

Excepted return value :

5039

27. Given a unique positive integer array with elements ranging from 0 to (length of array -1), write a program to interchange the element value and its corresponding index values.

For example: If $a[0]=3$, $a[1]=2$, $a[2]=0$ and $a[3]=1$ then the final array would be : $a[0]=2$, $a[1]=3$, $a[2]=1$ and $a[3]=0$

The input to the method swapArr of class Indexinterchange shall consist of an array arr. The method should return an array after replacing the elements with their index values. The values in arr shall always be and cover all numbers between 0 to (length of array -1).

Useful Commands: • length method is used to calculate the length of a 1-D array. The statement `int a=arr.length;` stores the length of array arr in a.

TestCase 1:

Input: (4. 3, 0, 5. 1. 2) **Expected Return Value:** [2 4. 5. 1. 0. 3)

TestCase 2:

Input: (7. 6. 5. 4. 0. 1. 2. 3) **Expected Return Value:** [4, 5, 6, 7, 3, 2, 1, 0)

28 . submission of a fully working code over partially correct but efficient

code. Once submitted, you cannot review this problem again. You can

use `System.out.print/n()` to debug your code. The

`System.out.print/n()` may not work in case of syntax/runtime error.

The

version of JDK being used is 1.8.

Systems that can run multiple concurrent jobs on a single CPU have a process

for choosing which tasks to run when, and how to break them up, called

"scheduling". The Round-Robin policy for scheduling runs each job for a fixed

amount of time before switching to the next job. The waiting time for a job is

the total time that it spends waiting to be run Each job arrives at a particular

time for scheduling and takes a certain amount of time to run,, When a new

job arrives, it is scheduled after existing jobs already waiting for CPU time.

Given a list of job submissions, calculate the average waiting time for all jobs

using the Round Robin policy.

The input to the method waitingTimeQobinof class QoundQobin consists of

two integer arrays containing job arrival and run times and an integer q

representing the fixed amount of time used by the Round-Robin policy The

list of job arrival times and job run times are sorted in ascending order by

arrival time. For jobs arriving at the same time, process them in the order they

are found in the arrive/ array. You can assume the jobs arrive in such a way that the CPU is never idle.

The function should return a floating point number for the average waiting time which is calculated using Round-Robin policy. Assume 0 job arrival time 100 and $0 < \text{job run time} < 100$.

Input:

[0,1,4],[5,2,3],3,3

Expected Return Value:

2.333333

Explanation:

The processes run in the following time slots - P1 initially runs for 3 seconds, P2 runs for 2 second, meanwhile P3 arrives. Since P1 was in the queue first, it runs for its remaining 2 seconds while P3 waits Then P3 finally runs for 3 secs The waiting time of processes P1, P2, P3 are 2, 2, and 3 respectively. The average is thus 2.333333 second.

TestCase 2:

Input:

[0,1, 3, 9], [2, 1, 7,5], 4, 2

Expected Return Value:

10.000000

Explanation:

The processes run in the following time slots - P1 initially runs for 2 seconds, P2 runs for 1 second, P3 runs for 6 seconds till P4 enters the system at the 3th second - when it runs for 2 seconds, P5 then runs for 1 second followed by P4 running for 3 seconds. The waiting time of processes P1, P2, P5, P4 are 0, 1, 2, 1 respectively. The average is thus 1 second.

29) The e-commerce company BookShelf wishes to analyse its monthly sales data between minimum range 30 to maximum range 100. The company has categorized these book sales into four groups depending on the number of sales with the help of these groups the company will know which stock they should increase or decrease in their inventory for the next month. The groups are as follows.

Sales Range	Groups
30-50	D
51-60	C
61-80	B
81-100	A

Write an algorithm to find the group for given book sale count.

Input

The input consists of an integer saleCount representing the total sales of a book.

Output

Print a character representing the group for a given sale count.

Constraints

$$30 \leq \text{SaleCount} \leq 100$$

Example:

Input

57

Output

c

Explanation:

57 lies in the range 51 to 60, so the group is B.

30) A data company wishes to store its data files on the server. They .. N files. Each file has a particular size. The server stores the files in bucket list. The bucketID is calculated as the sum of the digits of its file size. The server .. the bucket ID for every file request where the file is stored.

Write an algorithm to find the bucketIDs where the files are stored.

Input

The first line of the input consists of an integer numFiles, representing the number of files to be stored (N).

The second line consists of N space-separated integers — fileSize, fileSize , fileSize2, fileSizeN, representing the sizes of the files.

Output

Print N space-separated integers representing the bucket IDs for each file, respectively.

Constraints:

$$0 \leq \text{numFiles} \leq 10^6$$

$$0 \leq \text{fileSize}_i \leq 10^6$$

$$0 \leq i < \text{numFiles}$$

Example

Input

4

43 345 20 987

Output

7 12 2 24

Explanation:

The file ID 0 is of 43. So, it is stored in bucket ID 7($4 + 3$)

The file ID is of size 345. So, it is stored in bucket ID 12($3 + 4 + 5$) The bucket IDs for the remaining files are calculated similarly

31) A company wishes to modify the technique by which tasks in the processing queue are executed. There are N processes with unique IDs from 0 to $N-1$. Each of these tasks has its own execution time. The company wishes to implement a new algorithm for processing tasks. For this purpose they have identified a value K . By the new algorithm, the processor will first process the task that has the K th shortest execution time.

Write an algorithm to find the K th shortest execution time.

Input

The first line of the input consists of two space-separated integers — `numTasks` and `valueK`, representing the number of tasks (N) and the value K , which is used as reference respectively.

The second line consists of N space-separated integers — `executionTime1`, `executionTime 2`,.. `Execution TimeN` representing the execution times of the tasks.

Output:

Print an integer representing the Kth shortest execution time.

Constraints:

$$0 \leq \text{valueK} < \text{numTasks} \leq 10^6$$

$$0 \leq \text{executiontime}_i \leq 10^6$$

$$0 \leq i < \text{numTasks}$$

Example

Input:

7 5

9 -3 8 -6 -7 18 10

Output:

9

Explanation:

The sorted list of execution times is (-7, -6, -3, 8, 9, 10, 18]

So, the 5th smallest execution time is 9.

32) The company digital secure Data Solutions provides data encryption and data sharing services Their process uses a key k for encryption when Transmitting a number. To encrypt a number, each digit in the number is replaced by the following kth digit after in the

number .The series of the digit is considered in a cyclic fashion for the last k digits.

Write an alogorithm to find the encrypted number .

INPUT:

The input consist of two space – separated positive integers - data and key ,representing the number and the key(k),respectively

OUTPUT:

Print an integer representing the encrypted character

Constraints:

$$0 < \text{data} \leq 10^9$$

Test cases:

i/p: 25143 3

o/p:43251

Explanation:

Replace 2 with 4 , 5 with 3, 1 with 2, 4 with 5 , and 3 with 1 .

So the output is 43251

33) EasyWay is an online exam for new graduates of any discipline to find entry level jobs in their fields . The website generates the roll number of its registered students with the help of the students application numbers. The process

Includes a key K for generating an individual roll number. To generate the roll number ,each digit in the application number is replaced by the Kth digit that comes after in in the application number. The series of digits is considered in a cyclic fashion for the last K digits.

Write an algorithm to generate the roll number from the given application number.

Input :

The input consists of two space-separated positive integers – applicaNum and key, representing the application number and key(K) respectively.

Output:

Print an integer representing the roll number.

Constraints:

$0 < \text{applicaNum} \leq 10^9$

Test cases:

Input:

43251 3

Output:

25143

Explanation:

Replace 4 with 2,3 with 5,2 with 1,5 with 4,and 1 with 3

So the output is 25143

34) The bank SafeMoney had some dormant accounts. The bank charges certain monthly rates for the maintenance of these accounts. Because of these monthly deductions ,the balance of some of these accounts are negative . The bank wishes to close these negative-value dormant accounts.

Write an algorithm to help the bank find the number of dormant bank accountants that have a negative balance.

Input: dd

The first line of the input consists of an integer numOfAccounts representing the number of dormant accounts (N)

The second line consists of N space-separated integers – ac1,ac2....acN representing the balance in each account

Output:

Print an integer representing the number of dormant account that must be closed for negative balance.

Constraints:

$0 \leq \text{numOfaccounts} \leq 10^6$

$-1006 \leq \text{balance} \leq 1006$

$0 \leq i < \text{numOfaccounts}$

Example:

I/P:

10

-5 -3 8 -6 -7 18 10 -4 -3 11

O/P:

6

EXPLANATION:

The accounts that must be closed for negative balance are at indices[0, 1, 3, 4, 7, 8] i.e [-5, -3, -6, -7, -4, -3]

So the output is 6.

35) In a company ,an employee's rating point(ERP) is calculated as the sum of the rating points given by the employee's manager and HR .the

employee rating grade (ERG) is calculated according to the ERP ranges given below.

ERP	ERG
30-50	D
51-60	C
61-80	B
81-100	A

Write an algorithm to find the ERG character for a given employee's ERP

INPUT:

The input consists of an integer ERP ,representing the calculated employee rating point

OUTPUT:

Print a character representing the ERG for a given employee's ERP

36) SecretMessage agency provides message encoding and decoding services for secure data transfer .The first step in decoding includes removal of special characters and the whitespaces from the message,as special characters and whitespaces do not hold any meaning.

Write an algorithm to help the agency find the number of special characters and whitespaces in a given message

INPUT:

The input consists of a string message ,representing the message that need to be decoded by the agency

OUTPUT:

Print an integer representing the number of special characters and whitespaces present in a given message

37) In a science research lab, combining two nuclear chemicals produces a maximum energy that is the product of the energy of the two chemicals. The energy values of the chemicals can be negative or positive. The scientist wishes to calculate the sum of the maximized energies of the two elements when the reaction happens.

Write an algorithm to find the total energy produced by the chemicals when the reaction happens

INPUT:

The first line of the input consists of an integer numOfChem, representing the number of chemicals(N)

The second line consists of N space-separated integers ener1,ener2.... $ener_N$ representing the energies of the chemicals

.

OUTPUT:

Print an integer representing the total energy produced by the chemicals when the reaction happens

Constraints:

$$0 \leq \text{numOfChem} \leq 10^6$$

$$-10^6 \leq \text{ener}_i \leq 10^6$$

$$0 \leq i < \text{numOfChem}$$

Example:**Input:**

7

9 -3 8 -6 -7 8 10

Output

19

Explanation:

The maximum product of the energies is 90..i.e 9×10

So the sum of the energies of the chemicals is 19.

Test cases:

i/p :

6

-3 5 -6 9 8 -9

Output:

17

i/p:

5

6 4 2 3 9

o/p:

15

38) Write an algorithm to help the agency find the number of special characters and whitespaces in a given message .

Input:

The input consists of a string message, representing the message that need to be decoded by the agency.

Output:

Print an integer representing the number of special characters and whitespaces present in a given message.

Example:

I/p:

Gasgg54@#vscsd!s*

O/P:

4

39) A company wishes to devise an order confirmation procedure. They plan to require an extra confirmation instead of simply auto-confirming the order at the time it is placed. For this purpose , the system will generate one-time password to be shared with the customer . The customer who is placing the order has to enter the one-time password to confirm the order. The one –time password generated for the requested order ID, as the product of the digits in the Order ID

Write an algorithm to find the One-Time password for the order ID

INPUT:

The input consists of an integer orderID, representing the order ID of the enqueued order.

OUTPUT:

Print an integer representing the one-time password generated for the order ID.

EXAMPLE:

Input:

2342

Output:

48

40) Jackson, a math research student , is developing an application on prime numbers. For the given two integers on the display of the application, the user has to identify all the prime numbers within the given range (including the given values).Afterward , the application will sum all these prime numbers. Jackson has to write an algorithm to find the sum of all the prime numbers of the given range.

Write an algorithm to find the sum of all the prime numbers of the given range.

INPUT:

The input consists of two space-separated integers rangeLeft and rangeRight ,representing the boundary values of the given range.

OUTPUT:

Print an integer representing the sum of the largest and smallest prime numbers of the given range.

Constraints:

$$-10^9 \leq \text{rangeLeft} < \text{rangeRight} \leq 10^9$$

Example

I/P:

-30-11

O/P:

-112

Explanation:

The prime numbers within the given range are -29,-23,-19,-17,-13 and -11. The sum of the prime number is -112

So the output is -112.

41) An e-commerce company plans to give their customers a discount for the New Years holiday. The discount will be calculated on the basis of the bill amount of the order placed. The discount amount is the

product of the sum of all odd digits and the sum of all even digits of the customers total bill amount.

Write an algorithm to find the discount amount for the given total bill amount.

INPUT:

The input consists of an integer billAmount ,representing the total bill amount of a customer

OUTPUT:

Print an integer representing the discount amount for the given total bill

Constraints:

$0 < \text{billAmount} \leq 10^9$

Example:

I/P:

2514795

O/P:

162

TEST CASE 1:

I/P:

572698

O/P:

336

TEST CASE 2:

I/P:

146153

O/P:

100

42) A company wishes to bucketize their item IDs for the better search operations. The bucket for the item ID is chosen on the basis of the maximum value of the digit in the item ID. Write an algorithm to find the bucket to which the item ID will be assigned.

INPUT:

The input consists of an integer item ID, representing the identity number of the item.

OUTPUT:

Print an integer representing the bucket to which the item ID will be assigned

Example:

I/P:

32387634

O/P:

8

EXPLANATION:

8 is the maximum digit value in the given item ID .So output is 8

43) In a science research lab, the combination of two nuclear chemicals produces initial energy as X . This energy X changes at a consistent rate R every second. The scientist wishes to calculate the total energy produced if the reaction is allowed to occur for N seconds

Write an algorithm to find the total energy produces.

INPUT:

The input consists of three space-separated integers – $\text{initialEnergy}(X)$, rate and time representing the initial energy produced upon combining the nuclear chemicals ,the consistent rate of change, and the N th second for which the scientist wishes to calculate the total energy produced respectively.

OUTPUT:

Print an integer representing the total energy produced by the Nth second.

Example:**I/P:**

5 3 3

O/P

24

Explanation:

For N=1 an Initial energy of 5 is generated.

For N=2 a consistent rate of 3 is added , so it becomes 8.

For N=3, again 3 is added to previous energy value , so it becomes 11

The total energy produced after 3 seconds is $24(5+8+11)$

44) A game company has designed an online lottery game, Bingo. In this game, N number cards are displayed. Each card has a value on it. The value can be negative or positive. The player must choose two cards. To win the game, the product of the values of the two cards must be the maximum value possible for any pair of cards in the display. The winning amount will be the sum of the two cards chosen by the player.

Write an algorithm to find the winning amount as the sum of the values of the two cards whose product value is maximum.

INPUT:

The first line of the input consists of an integer numCards, representing the number of cards(N).

The second line consists of N space-separated integers $val_1, val_2, \dots, val_N$ representing the values on the cards.

OUTPUT:

Print an integer representing the sum of the values of the two cards whose product value is maximum.

CONSTRAINTS:

$$0 \leq \text{numCards} \leq 10^6$$

$$-10^6 \leq \text{val}_i \leq 10^6$$

$$0 \leq i < \text{numCards}$$

Example:

Input:

7

9 -3 8 -6 -7 8 10

Output:

19

EXPLANATION:

The maximum product of the values is 90..i.e 9×10

So, the sum of the values of the selected cards is 19.

45) A company is transmitting data to another server . The data is in the form of numbers . To secure the data during transmission ,they plan to obtain a security key that will be sent along with the data. The security key is identified as the count of the repeating digits in the data.

Write an algorithm to find the security key for the data.

INPUT:

The input consists of an integer data, representing the data to be transmitted.

OUTPUT:

Print an integer representing the security key for the given data.

Example:

I/P:

578378923

O/P:

3

EXPLANATION:

The repeated digits in the data are 7,8 and 3. So , the security key is 3.

TEST CASE 1:

I/P:

234567898

O/P

1

TEST CASE 2:

I/P:

11233455

O/P:

3

46) Amazon Local wants to show deals where customers can hike to an area of a given altitude and get a great deal on a local product . To do that, we want to see if there's a deal at a customer's desired altitude. Remember that some destinations are below sea level .To store the altitudes,we have a two-dimensonal integer matrix.The top-left position in the matrix is <0.0> and the bottom right corner is <rowCount-1,columnCount-1>.The altitudes in each column and row are sorted in ascending order from top to bottom and left to right, respectively.

Write an algorithm to find the pair containing the location of the target altitude in <row,colum> order.

Input:

The input to the function /method consists of four arguments-

rowCount an integer representing the number of rows in the matrix :

columnCount , an integer representing the number of columns in the matrix:

matrix , representing a two-dimensional integer matrix:

targetValue, an integer representing the target altitude.

Output:

Return a pair of integers representing the location of the target altitude in <row,column>order . if return (-1,-1). You may assume that there will be at most one deal at the target altitude.

Constraints:

$0 < \text{rowCount}, \text{columnCount}$

Note:

The matrix contains only one unique targetValue.

Example:**i/p:**

rowCount=3

columnCount=4

matrix=

[[-3, 1, 31, 40],

[10, 33, 40, 660],

[22, 43, 161, 702]]

targetValue=3

47) Amazon is coming up with an automated system to help create email aliases that contain all the people under a certain manager. Each organization is modeled as a binary tree corresponding to their employee id,

Greg is writing a program that will determine if a set of workers should be added to the email alias by seeing if the smaller tree the set of workers creates is a subtree of the larger tree of the organization. A subtree of a tree T is a tree consisting of a node in T and all of its descendants in T .

You will help Greg by writing a method that takes in objects of the root nodes of the two binary trees, where root1 is the root node of the parent organization tree of all employees. and root2 is the root node of the smaller tree. Return 1 if root2 is a subtree of root, Otherwise, return -1.

NOTE:

Compare the trees using the integer values of the nodes and NOT the objects of the node themselves. Assume the Integer values in the nodes are unique in each of the trees.

INPUT:

The Input to the function/method consists of two arguments:

root 1, a node of the head of the secondary binary tree representing the larger tree of the organization:

root 2, a node of the head of the second binary tree representing the smaller tree.

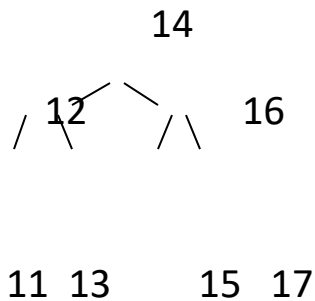
OUTPUT:

Return an Integer,'1' If root2 is a subtree of root1, Otherwise, return -1.

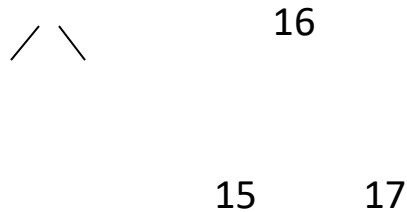
EXAMPLE:

I/P:

Root1=14



root2=16



o/p:

1

Explanation:

The smaller tree is a subtree of the larger tree of the organization . so the output is 1.

48) Amazon Adventure team is adding Choose Your Own Adventure books to Kindle. At the end of a chapter in the book readers can see how many other readers made the same outcome. The Adventure team has modeled the decisions a reader makes using a binary tree .Given the full decision tree of a reader. the Adventure team needs to take a smaller decision tree and see if it exists in the customers full decision tree (is the smaller decision tree a subtree of the customers full decision tree).

A subtree of a tree T is a tree consisting of a node in T and all of its descendants in T.

Input:

The input to the function:method consists of two arguments:

Root1, a node of the head of the binary tree representing the full customer decision tree:

root2 a node of the head of the second binary tree representing the smaller decision tree.

Output:

Return an integer '1' if the smaller decision tree is a subtree of the full customer decision tree. Otherwise return '-1'.

Note :

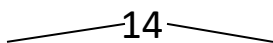
Compare the trees using the integer Vat of the nodes and NOT the objects of the node themselves. Assume the integer values in the node are unique in each of the trees.

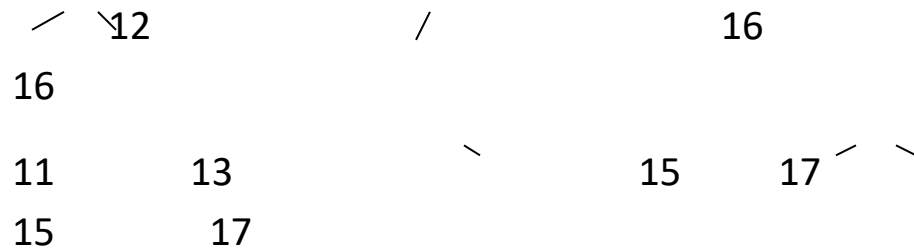
Example:

i/p:

root1=14

root2=16





o/p:1

49) Amazon is working on creating a road network to connect all their warehouses to help in transferring products between them. The proposed road network guarantees that all the warehouses will be connected to each other directly or indirectly. A road can be classified as "critical" or "non-critical". A road is considered "critical" if its removal results in a disconnected network of warehouses. Amazon wants to significantly increase the efficiency of their warehouse network by investing in better infrastructure to build those roads.

Write a method that returns the critical connections from the proposed connections.

Input:

The input to the function/method consists of three arguments - numOfWorks, an integer representing the number of warehouses in the proposed plan:

numOfRoads, an integer representing the number of roads between the warehouses:

roads a list of pairs of integers representing the roads between two warehouses.

Output :

Return a list of integer pairs representing the critical connections. If there are no critical connections, return a list with empty pair - not just an empty list.

Constraints:

Input:

numOfWarehouses=5

numOfRoads=5

roads=[[1,2],[1,3],[3,4],[1,4],[4,5]]

OUTPUT:

[[1,2],[4,5]]

EXPLANATION:

THERE ARE TWO CRITICAL ROADS.

If these roads break, then the warehouse will be disconnected since the warehouse 2 is not directly/indirectly connected with warehouse 5.

Remaining three roads are not critical:

1. Between warehouses 1 and 3
2. Between warehouses 1 and 4
3. Between warehouses 3 and 4

If any of these roads break, the network will remain connected since warehouses 1, 3, and 4 can still be reached with the rest of the network.

Helper Description The following class is used to represent a Pair of integers which is already implemented in the default code (Do not write this definition again in your code):

50) In a city, there are bus stations located at an equal distance (unit distance) along a straight road. The bus stations have unique station IDs. The buses operate between some of the bus stations only. There are some bus stations that have multiple buses operating between them. The highway administration wants to decrease the number of buses operating in the city in order to avoid traffic congestion. To do this, if there is an overlap between the routes of the buses then all such buses are replaced by a single bus. The administration wants to find the number of buses that are removed from the city once they have been replaced.

Given the IDs of the bus stations having a bus operating between them, write an algorithm to help the highway administration find the number of buses that are removed from the city once they have been replaced.

Input :

The first line of the input consists of an integer IC representing the number of buses. The next K lines consist of two space-separated integers A and B representing the IDs of the bus stations having a bus operating between them.

Output :

Print an integer representing the number of buses that are removed from the city once they have been replaced.

51) When a customer shows interest in a particular author. Amazon thinks the customer might be interested in books written by authors that the customer and author both like. There are many complex algorithms which will be tried to determine the best books to introduce to the customer. but the original data might be destroyed. Given a linked list where each node is an author ('value'), a reference to the next author ('next'), and a reference to an author the author likes ('arbitrary').

Input :

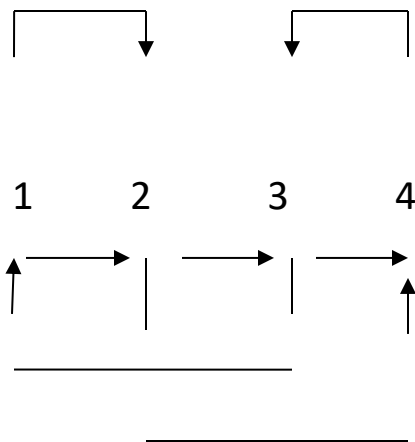
The Input to the function/method consists of an argument head. representing the head of the linked list.

Output:

Return the head of the new linked list to copy the given linked list with the same data and structure at a different memory address.

Example

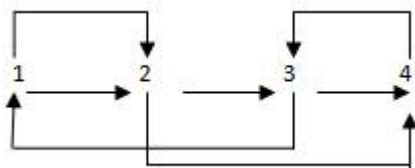
Input :



1.next=2; 2.next=3; 3.next=4;4.next=null;

1.arbitrary=2; 2.arbitrary=4;3.arbitrary=1;4.arbitrary=3;

Output :



1.next=2; 2.next=3; 3.next=4;4.next=null;

1.arbitrary=2; 2.arbitrary=4;3.arbitrary=1;4.arbitrary=3;

52) Tom is performing an experiment in which he has to select N products. Each product has two attributes i.e. energy and weight. All the products are either manufactured by Reds Ltd. or Blues Ltd. the products manufactured by Blues Ltd. cannot function alone and need to be selected with some other product of the same company. The products from Reds Ltd., on the other hand, can be selected independently. Tom has to select products such that the total weight of the selected products does not exceed the weight W and the selected products have the maximum total energy value. Write an algorithm to help Tom find the maximum energy.

Input :

The first line of the input consists of two space separated integers N and W representing the number of product to select and the threshold value of the total weight of N selected products, respectively. The next N lines consist of three space separated integers e, m and c representing the energy, weight and the manufacturing company marked as 0 or 1 (0:reds ltd ,1. Blue; 1 td.), respectively .

Output:

Print an integer representing the maximum energy.

Constraints:

$$1 \leq N \leq 10^3$$

$$1 \leq W \leq 10^5$$

$$1 \leq e, m \leq 10^5$$

EXAMPLE:**I/P:**

4 1 0

4 5 0

2 3 1

3 3 1

4 2 0

O/P:

9

EXPLANATION:

The products (1) and (4) can be taken alone but products (2) and (3) can not be taken alone. The optimal solution is to choose products (2),(3) and (4) and the maximum possible energy is 9.

53. The program will receive 3 English words inputs from STDIN

These three words will be read one at a time, in three separate line

The first word should be changed like all vowels should be replaced by

*

The second word should be changed like all consonants should be replaced by @

The third word should be changed like all char should be converted to upper case

Then concatenate the three words and print them

Other than these concatenated word, no other characters/string should or message should be written to STDOUT

For example: if you print how are you then output should be h*wa@eYOU.

You can assume that input of each word will not exceed more than 5 chars

Test Cases

Case 1

Input

how

are

you

Expected Output : h*wa@eYOU

Case 2

Input

how

999

you

Expected Output : h*w999YOU