

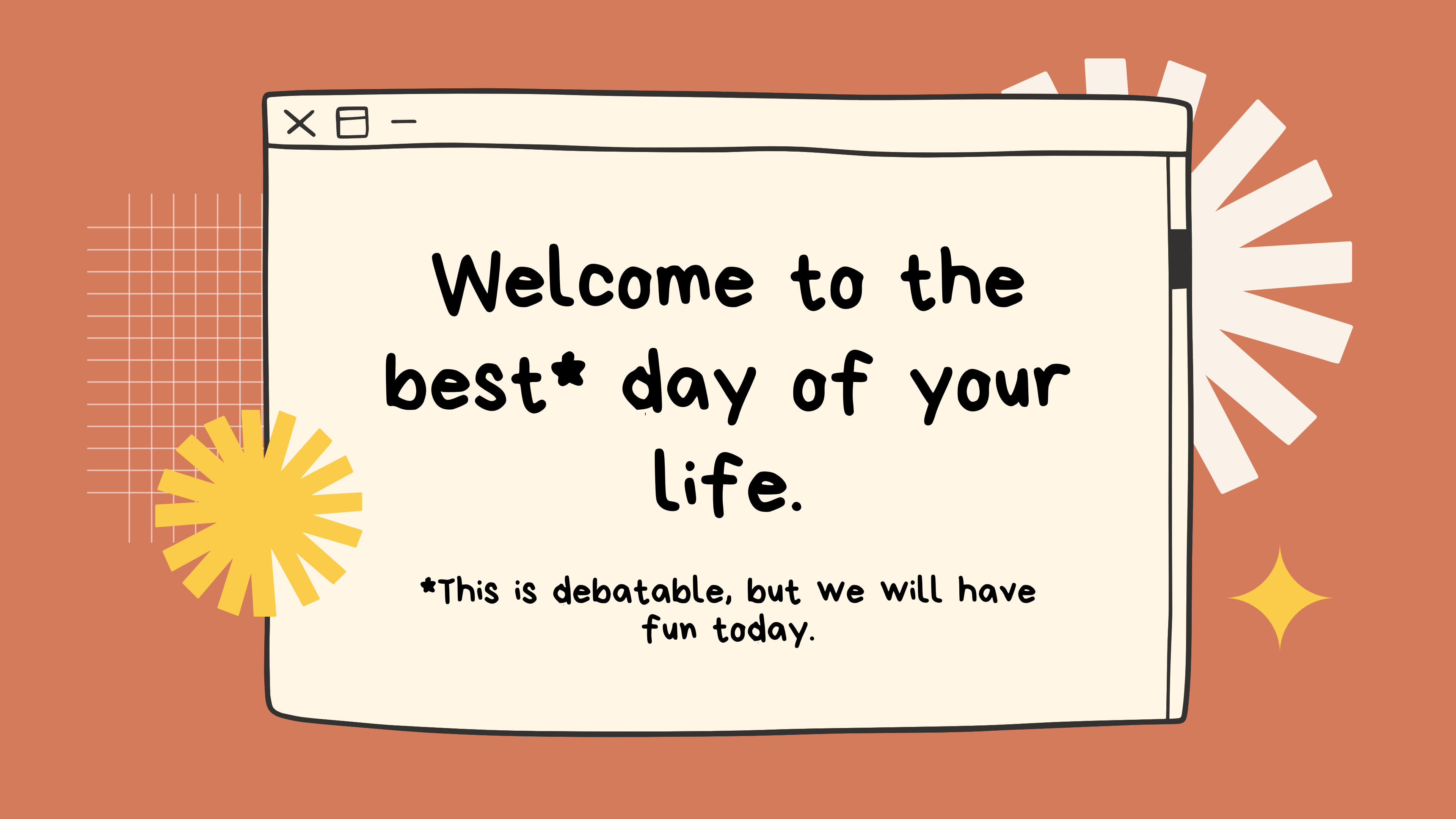
https://atcoder.jp/contest



Never Have I Ever

Competitive
Programming ^^





× □ -

Welcome to the
best* day of your
life.

*This is debatable, but we will have
fun today.



✦ Rules ✦

Write down the
flowchart first

You can only start to
code when your
flowchart is accepted
by Mentor

There are 10 questions
that **MUST BE**
ANSWERED



Question 1

Follow along and have fun!



Write a program that calculates the sum of all odd numbers between a given lower bound and upper bound (inclusive). If there are no odd numbers in the range, return 0.

Input:

Two integers, lower and upper ($1 \leq \text{lower} \leq \text{upper} \leq 10^6$), represent the lower and upper bounds of the range.

Output:

An integer represents the sum of all odd numbers within the specified range.

Example:

Input: 1 10

Output: 25

Explanation: The odd numbers are 1, 3, 5, 7, 9. Their sum is $1 + 3 + 5 + 7 + 9 = 25$.

Input: 4 8

Output: 12

Explanation: The odd numbers are 5 and 7. Their sum is $5 + 7 = 12$.

Input: 15 20

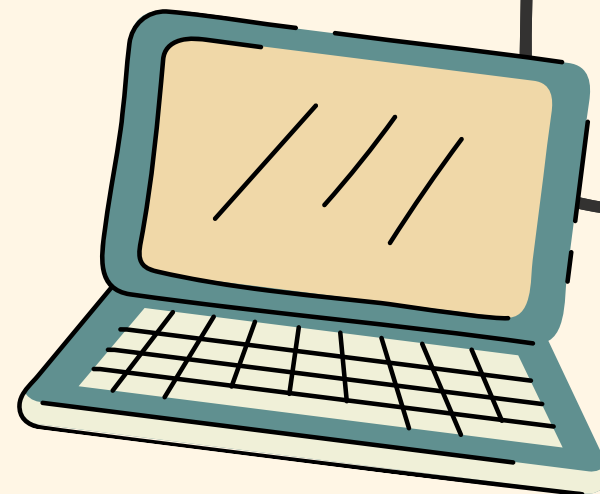
Output: 45

Explanation: The odd numbers are 15, 17, 19. Their sum is $15 + 17 + 19 = 51$.



Question 2

Follow along and have fun!



This is a staircase of size $n = 4$;

```
*  
**  
***  
****
```

Its base and height are both equal to . It is drawn using * symbols and spaces. The last line is not preceded by any spaces.

Write a program that prints a staircase of size.

Print

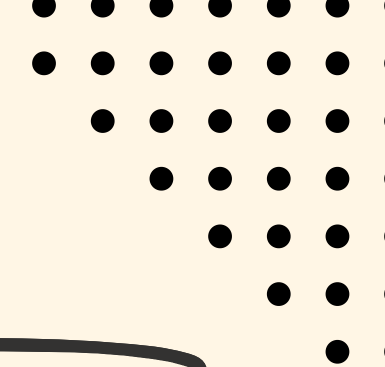
Print a staircase as described above.

Input Format

A single integer, , denoting the size of the staircase.

Constraints

$0 < n \leq 100$



Question 3

Follow along and have fun!



Write a program that finds all prime numbers within a given range. The program should take two integers as input, representing the lower and upper bounds, and output a list of all prime numbers in that range (inclusive).

Input:

Two integers, lower and upper ($1 \leq \text{lower} \leq \text{upper} \leq 10^6$), representing the lower and upper bounds of the range.

Output:

A list of integers representing all prime numbers between lower and upper. If there are no prime numbers in the range, return an empty list.

Example:

Input: 10 30

Output: [11, 13, 17, 19, 23, 29]

Explanation: The prime numbers between 10 and 30 are 11, 13, 17, 19, 23, 29.

Input: 1 10

Output: [2, 3, 5, 7]

Explanation: The prime numbers between 1 and 10 are 2, 3, 5, 7.

Input: 20 25

Output: [23]

Explanation: The only prime number between 20 and 25 is 23.

Input: 24 24

Output: []

Explanation: There are no prime numbers in this range.

Constraints:

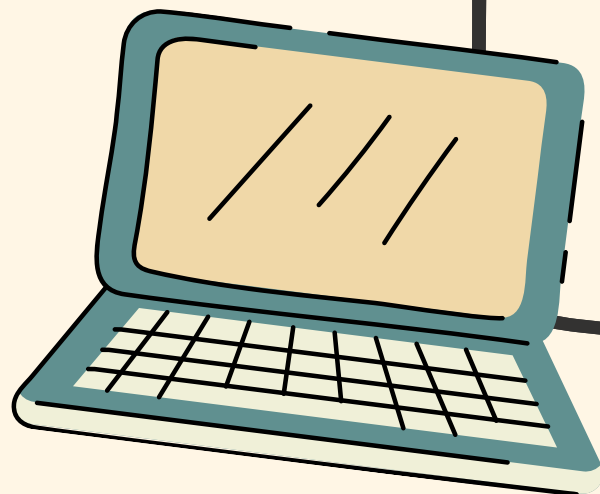
Ensure that your solution is efficient enough to handle the upper limit of the range.



Question

4

Follow along and have fun!



Given a String str, reverse the string without reversing its individual words. Words are separated by dots.

Note: The last character has not been '.'.

Examples:

Input: str = i.like.this.program.very.much

Output: much.very.program.this.like.i

Explanation: After reversing the whole string(not individual words), the input string becomes much.very.program.this.like.i

Input: str = pqr.mno

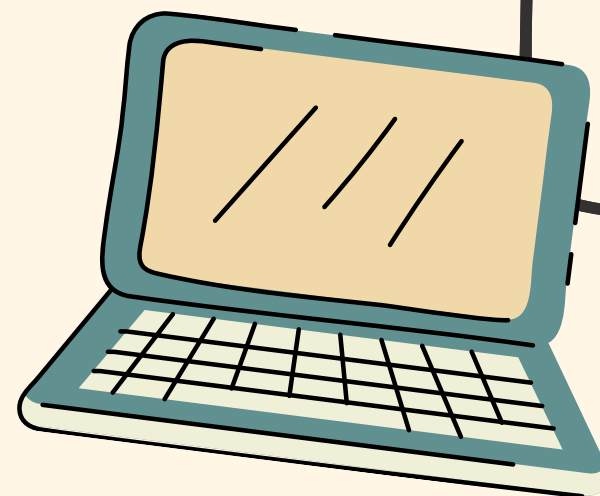
Output: mno.pqr

Explanation: After reversing the whole string , the input string becomes mno.pqr



Question 5

Follow along and have fun!



This is a staircase of size $n = 4$;

```
*  
**  
***  
****
```

Its base and height are both equal to . It is drawn using * symbols and spaces. The last line is not preceded by any spaces.
Write a program that prints a staircase of size.

Print

Print a staircase as described above.

Input Format

A single integer, , denoting the size of the staircase.

Constraints

$0 < n \leq 100$



Question 6

Follow along and have fun!



Given an array of n integers. The task is to find all elements that have more than one occurrences. The output should only one occurrence of a number irrespective of number of occurrences in the input array.

Examples:

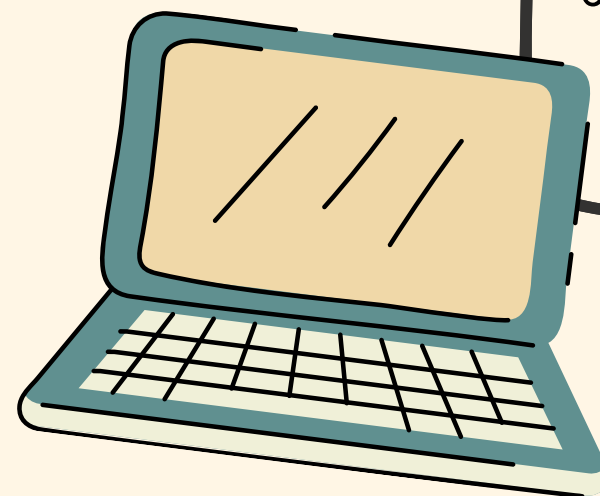
Input: {2, 10, 10, 100, 2, 10, 11, 2, 11, 2}
Output: {2, 10, 11}

Input: {5, 40, 1, 40, 100000, 1, 5, 1}
Output: {5, 40, 1}



Question 7

Follow along and have fun!



This is a staircase of size $n = 5$;

```
1
2 1
3 2 1
4 3 2 1
5 4 3 2 1
```

Its base and height are both equal to . It is drawn using numbers and spaces. The last line is not preceded by any spaces.

Write a program that prints a staircase of size.

Print

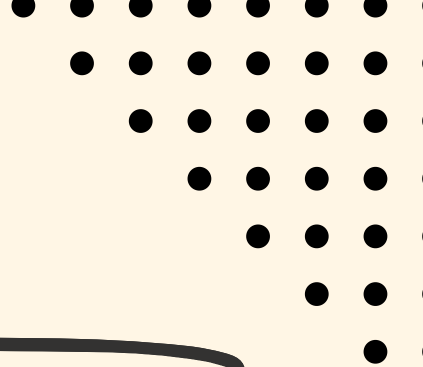
Print a staircase as described above.

Input Format

A single integer, , denoting the size of the staircase.

Constraints

$0 < n \leq 100$





Question 8

Follow along and have fun!



Write a program that counts the number of vowel letters in a given string. The vowels are defined as the characters a, e, i, o, u (case-insensitive).

Input:

A single string s ($1 \leq |s| \leq 1000$) consisting of English letters (both uppercase and lowercase) and possibly spaces or punctuation.

Output:

An integer representing the total number of vowels in the string.

Example:

Input: "Hello, World!"

Output: 3

Explanation: The vowels are e, o, o.

Input: "Programming is fun!"

Output: 5

Explanation: The vowels are o, a, i, u.

Input: "XYZ"

Output: 0

Explanation: There are no vowels in this string.

Constraints:

The input string can include spaces, punctuation, and digits, but you should only count the vowels

Question 9

Follow along and have fun!



Write a program that calculates the average of all elements in a given array of integers. The average should be returned as a floating-point number.

Input:

An array of integers `arr` where $(1 \leq |\text{arr}| \leq 1000)$ and each integer $(-10^6 \leq \text{arr}[i] \leq 10^6)$.

Output:

A floating-point number representing the average of the elements in the array. The result should be formatted to two decimal places.

Example:

Input: `[1, 2, 3, 4, 5]`

Output: `3.00`

Explanation: The sum is 15, and there are 5 elements, so the average is $15 / 5 = 3.00$.

Input: `[10, 20, 30]`

Output: `20.00`

Explanation: The sum is 60, and there are 3 elements, so the average is $60 / 3 = 20.00$.

Input: `[-1, 0, 1]`

Output: `0.00`

Explanation: The sum is 0, and there are 3 elements, so the average is $0 / 3 = 0.00$.

Input: `[5]`

Output: `5.00`

Explanation: The sum is 5, and there is 1 element, so the average is $5 / 1 = 5.00$.



Question 10

Follow along and have fun!



Write a program that removes duplicate elements from a given array of integers. The resulting array should maintain the order of the first occurrences of the elements.

Input:

An array `arr` of integers ($1 \leq |\text{arr}| \leq 1000$), where each integer can range from -10^6 to 10^6 .

Output:

A list of integers representing the array with duplicates removed.

Example:

Input: [1, 2, 3, 4, 2, 5, 3]

Output: [1, 2, 3, 4, 5]

Explanation: The duplicates 2 and 3 are removed, and the order of first occurrences is preserved.

Input: [4, 5, 6, 6, 7, 7, 8]

Output: [4, 5, 6, 7, 8]

Explanation: The duplicates 6 and 7 are removed.

Input: [1, 1, 2, 3, 4, 4, 5]

Output: [1, 2, 3, 4, 5]

Explanation: The duplicates 1 and 4 are removed.