BATCHS

1. Harsha and Prashanti and Manikanta

The Sprinter sports club conducted a zone level relay running race. Due to the difficult scenario of covid, the Sprinter Sports Club held a zone level relay running competition in a nontraditional way, requiring the teams to compete individually and measuring the time it took each team to complete the course. The team that finishes the race in the shortest amount of time will be declared the winner. Create a Java application to assist the sports club in identifying its winners.

Assumptions:

- Assume each team has 4 members
- Take input from the user as a single String with fields separated by colon. The format of the input string is shown below.
- TeamName:TimeTakenByMember1:TimeTakenByMember2:TimeTakenByMember3:TimeTakenByMember4.
- Time taken by each member must be in float

Requirements:

- If the number of teams is less than 2, print "<numberOfTeams> is an invalid input" and terminate the program
- If the time taken by each member is less than 1, print "Invalid number" and terminate the program
- The output should be like "<winning team name> team wins the race in <total time taken> minutes"
- If two teams finish in the same amount of time, the team that started the race first will win.
- Assume that the user inputs will be in the order of the teams that started the race first, second, and so on.
- The output print statement should display the time with a precision of up to two decimal places. Use System.out.printf(""%.2f"", ""time""); for this purpose.

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided.

Do not use System.exit(0) to terminate the program

Sample Input/Output 1:

Enter the number of teams

4

Enter the details

Green:1.10:1.05:1.00:1.02

Red:1.05:1.04:1.10:1.00

Blue:1.11:1.10:1.10:1.05

Yellow:1.09:1.15:1.08:1.10

Green team wins the race in 4.17 minutes

Sample Input/Output 2:

Enter the number of teams

-2

-2 is an invalid input

Sample Input/Output 3:

Enter the number of teams

2

Enter the details

White:1.02:1.03:0:1.03

Invalid number

Sample Input/Output 4:

Enter the number of teams

2

Enter the details

Red:1.00:1.00:1.00:1.00

White:1.00:1.00:1.00:1.00

Red team wins the race in 4.00 minutes

Explanation:

Here Red team started the race first, that's why provided as 1st input. Since both teams completed the race in same time, i.e in 4.00 minutes, the team which started the race first will be considered as a winner. So, Red team wins the race.

2. Mandala Lavanya and Gopi

Guru gave a task to his students. He gave a sentence and the students have to swap the first and the last words and reverse the middle character. Help the students to solve this task using a java program

Requirements:

- The words present in the sentence must be more than 2, else print "Invalid Length"
- The word should contain only alphabets and space, else print "<sentence> is an invalid sentence"

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided

Please do not use System.exit(0) to terminate the program.

Sample Input/Output 1:

Enter the sentence

Do you wear your mask

mask ruoy raew uoy Do

Sample Input/Output 2:

Enter the sentence

Card reader

Invalid Length

Sample Input/Output 3:

Enter the sentence

Refer @ friend

Refer @ friend is an invalid sentence

3. Meesala Sirisha and Manohar

SIET private limited is all set to begin a new academic year with a bunch of talents. They need to give employee ids to all the freshers of all team. The employee id is generated by using the training id of the employees which was given at the time of training. Help the company in generating employee id by developing a java application

Requirements:

- -The training id should only contain 9 digits, otherwise print "<training id> is an invalid training id" and terminate the application
- -The first 4 digits in the training id represent year in which people got trained(it should be 2021), if not print "<year> is an invalid year" and terminate the application
- -The 5th and 6th digits represent team codes
 - 01 LP
 - 02 TA
 - 03 CT
 - 04 PT
 - 05 TT
- -Any other digits than the above mentioned one is given then print "<code> is an invalid team code" and terminate the application
- -The last 3 digits should be the employees roll number starting from 001 to 999, if not print "<roll no> is an invalid roll number" and terminate the application.
- -The generated employee id should be 9 characters long with the first 4 letters as **SIET**, the next two letters can be **LP/TA/CT/PT/TT** depending on the team code in the training id and the last 3 digits should be the employee's **roll number**.
- The trainingId is validated in accordance with the prescribed order.

[i.e when 1 or more validation rules gets violated , the first violation message gets displayed. Refer sample output]

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.

- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided

Please do not use System.exit(0) to terminate the program.

Sample Input/Output 1:

Enter the training id

202103069

Employee Id: SIETCT069

[Explanation: Employee Id is generated for the valid training id].

Sample Input/Output 2:

Enter the training id

202115

202115 is an invalid training id

[Explanation: In the given input the length of the training id is less than 9]

Sample Input/Output 3:

Enter the training id

201005869

2010 is an invalid year

[Explanation: In the given input, the year mentioned is incorrect].

Sample Input/Output 4:

Enter the training id

202119000

19 is an invalid team code

[Explanation: In the given input, both team code and the roll number is incorrect].

Sample Input/Output 5:

Enter the training id

202101000

000 is an invalid roll number

[Explanation: In the given input, the roll number is incorrect].

4. Kaki Ramya and Sujjith

The Whale Fishing Club (WFC) conducted a fishing competition on a big lake. The participants allowed for this competition should be 18 years and older. The participants should catch the fishes and give them to the referee so that he will add the count of the fishes based on their size. Then at the end of the day based on the count, points will be awarded. Help WFC by developing an application to convert the count into points in Java.

Requirements:

1. There are 3 types of fishes based on their size. Determine points based on the following

Big - 10 points

Medium - 6 points

Small - 3 points

2. Take input from the user as a single string separating each fields with a colon (:)

<participants name>:<participants age>:<big fish>:<medium fish>:<small fish>

- 3. Age should be greater than or equal to 18, else print "<age> is an invalid age" and terminate the application
- 4. If the fish count is less than 0 print "<fish count> is an invalid input" and terminate the application

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided

Do not use System.exit(0) to terminate the program

Sample Input/Output 1:

Enter the details

Hari:20:5:9:15

Hari scored 149 points

Explanation:

Points calculation

Big fish = 5*10 = 50

Medium fish = 9*6 = 54

Small fish = 15*3 = 45

Total points = 50 + 54 + 45 = 149

Sample Input/Output 2:

Enter the details

Quil:15:2:7:2

15 is an invalid age

Sample Input/Output 3:

Enter the details

Allan:22:-1:2:3

-1 is an invalid input

5. Koyyapu Chandini and Vinay Sai Rahul

Jack and Joy were playing a game. The game is about one player saying a sentence and the other player has to arrange the letters in that word in alphabetical order. Help Joy to play this game using a java program.

Requirements:

- Assume the letters in the sentence is in lowercase.
- The sentence should contain only alphabets and space, else print "<sentence> is an invalid input".

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided

Please do not use System.exit(0) to terminate the program.

Sample Input/Output 1:

Enter the sentence

the series

eht eeirss

Sample Input/Output 2:

Enter the sentence

5 is greater than 2

5 is greater than 2 is an invalid input

6. Kannepalli Gayatri and Srivali

Mr. Vicky gave a task to his students. He gave two words, but there were some spelling mistakes found. In the first string, "!" denotes the misspelt word. The second string has the correct spelling of the first string. Create a Java application and help the students remove the "!" and replace it with the correctly spelled character.

Requirements:

- Both the Strings must be of the same length. Otherwise, print "Length of the strings <String1> and <String2> does not match"
- Both the Strings must contain only alphabets and '!' symbol. Otherwise, print "**<String>** contains invalid symbols"
- If both the strings contain invalid symbols, print "<String1> and <String2> contains invalid symbols"
- The output must have the combined string without any symbols

Assume that space is allowed in between the words and assume that the second string always will have the correct spelt character of the misspelt first string in the respective positions.

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided

Please do not use System.exit(0) to terminate the program.

Sample Input/Output 1:

Enter the first string

Enter the second string

!ead

rrrr

read

Sample Input/Output 2:
Enter the first string
F!n! !ut
Enter the second string
!i!d O!!
Find Out
Sample Input/Output 3:
Enter the first string
Po**t**n
Enter the second String
!!si!io!
Po**t**n contains invalid symbols
Sample Input/Output 4:
Enter the first string
!a!i!
Enter the second string
V*l*d
V*l*d contains invalid symbols

prigra!!i!g Enter the second string programming programming Sample Input/Output 6: Enter the first string C!rr!s Enter the second string !a!!y Length of the strings C!rr!s and !a!!y does not match Sample Input/Output 7: Enter the first string C%rr*

7. Gudla Asritha and Yashash

Enter the second string

Sample Input/Output 5:

Enter the first string

Sheethal teaches her little daughter Charu about words and sentences. Sheetal gives Charu a task to find whether the given word is present in the given sentence or not. Help Charu complete her task by writing a Java program.

If the second input is present in the first input, then print "<second input> is present in the sentence". Else print "<second input> is not present in the sentence".

Note:

&a%\$y

• The input word is case sensitive

C%rr* and &a%\$y contains invalid symbols

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question.
- Ensure to provide the names for classes, interface, attributes and methods as specified in the question.
- Adhere to the code template, if provided.
- Please do not use System.exit(0) to terminate the program

Sample Input1:

Enter the sentence

Creativity is always having fun

Enter the word

having

Sample Output 1:

having is present in the sentence

Sample Input2:

Enter the sentence

we know one of the most places

Enter the word

fun

Sample Output2:

fun is not present in the sentence

8. Madireddi Monisree and Renetus

Sundram travels is one of the famous travel agencies, they would like to automate their application. Passengers have a facility to check whether buses are available for their destination. Write a java program to help the travel agency to do this task.

Assumptions:

- Assume buses available for these 10 cities only
- Chennai, Coimbatore, Erode, Karur, Madurai, Hyderabad, Salem, Bangalore, Delhi, Agra

Requirements:

- If bus available for the city then, print "Bus for <city name> is available"
- If bus not available for the city then, print "Bus for <city name> is not available"
- City names are case insensitive.

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided

Please do not use System.exit(0) to terminate the program.

Sample Input/Output 1:

Enter the city name

Delhi

Bus for Delhi is available

Sample Input/Output 2:

Enter the city name

Mumbai

Bus for Mumbai is not available

Sample Input/Output 3:

Enter the city name

chennai

Bus for chennai is available

9. Gogada Surya Satya and Meghana

Digital Technologies has decided to make some updates to the employee profile. So they like to add PAN number and E-mail ID in each profile. Help the firm to validate the PAN number and E-mail ID given by employees using the Java program

Requirements:

- PAN number should have exactly ten characters. The first 5 characters should be alphabets in uppercase, the next four characters should be digits from 0 to 9 and the last character should be an alphabet in uppercase
- If the PAN number fails the above condition, then print "**PAN number** is an invalid PAN number" and terminate the program.
- E-mail should end with "@digitec.com", before @ there should be at least 5 to maximum 10 characters. All characters should be in lowercase
- IF E-mail ID fails the above condition, then print "Invalid E-mail ID" and terminate the program.

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided.

Please do not use System.exit(0) to terminate the program

Sample Input/Output 1

Enter your name

Geetha

Enter your PAN number

SSTHP1234L

Enter your E-mail ID

geetha@digitec.com

Profile of Geetha updated successfully

Sample Input/Output 2

Enter your name

Pradeep

Enter your PAN number

QWER8456P

QWER8456P is an invalid PAN number

Sample Input/Output 3

Enter your name

Sara

Enter your PAN number

ABJKL1934F

Enter your E-mail ID

sara@digitec.com

Invalid E-mail ID

10. Nocharla Baby Srivani and Manogna

Born For Game, a YouTube channel is conducting a gaming tournament for Rs. 1 Lakh as prize money. They would like to get the player's game code to verify their in-game profiles. So help them to validate the player's code by writing a Java program.

Requirements:

- The code should have eight characters. If not print "<code> does not have the specified length".
- The code should start with the special character "#". If not print "<code> does not start with a valid special character".
- The next 4 characters should be alphabets in upper case. Else print "<num> is an invalid number for uppercase character".
- The last 3 characters should be digits from 0 to 9. Else print "<num> is an invalid number for digits".

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided.

Please do not use System.exit(0) to terminate the program

Sample Input/Output 1:

Enter your profile code

#ACEG321

#ACEG321 is a valid profile code whose last 3 digits are 321

Sample Input/Output 2:

Enter your profile code

#ZSA8975

3 is an invalid number for uppercase character

Sample Input/Output 3:

Enter your profile code

QWAE975

QWAE975 does not start with a valid special character

Sample Input/Output 4:

Enter your profile code

#KKGYI67

2 is an invalid number for digits

11. Vyshnavi and Saithi

JammIn this challenge, we use regular expressions (RegEx) to remove instances of words that are repeated more than once, but retain the *first occurrence* of any case-insensitive repeated word. For example, the words love and to are repeated in the sentence I love Love to To tO code. Can you complete the code in the editor so it will turn I love Love to To tO code into I love to code?

To solve this challenge, complete the following three lines:

- 1. Write a RegEx that will match any repeated word.
- 2. Complete the second *compile* argument so that the compiled RegEx is case-insensitive.
- 3. Write the two necessary arguments for *replaceAll* such that each repeated word is replaced with the very first instance the word found in the sentence. It must be the *exact* first occurrence of the word, as the expected output is case-sensitive.

Note: This challenge uses a custom checker; you will fail the challenge if you modify anything other than the three locations that the comments direct you to complete. To restore the editor's original stub code, create a new buffer by clicking on the branch icon in the top left of the editor.

Input Format

The following input is handled for you the given stub code:

The first line contains an integer, denoting the number of sentences. Each of the subsequent lines contains a single sentence consisting of English alphabetic letters and whitespace characters.

Constraints

Each sentence consists of at most English alphabetic letters and whitespaces.

•

Output Format

Stub code in the editor prints the sentence modified by the *replaceAll* line to stdout. The modified string must be a modified version of the initial sentence where all repeat occurrences of each word are removed.

Sample Input

5

Goodbye bye bye world world world

Sam went went to to to his business

Reya is is the the best player in eye eye game

in inthe

Hello hello Ab aB

Sample Output

Goodbye bye world

Sam went to his business

Reya is the best player in eye game

in inthe

Hello Ab

Explanation

- 1. We remove the second occurrence of bye and the second and third occurrences of world from Goodbye bye world world world to get Goodbye bye world.
- 2. We remove the second occurrence of went and the second and third occurrences of to from Sam went went to to to his business to get Sam went to his business.

- 3. We remove the second occurrence of is, the second occurrence of the, and the second occurrence of eye from Reya is is the the best player in eye eye game to get Reya is the best player in eye game.
- 4. The sentence in inthe has no repeated words, so we do not modify it.
- 5. We remove the second occurrence of ab from Hello hello Ab aB to get Hello Ab. It's important to note that our matching is *case-insensitive*, and we specifically retained the *first occurrence* of the matched word in our final string.

12. Muchinthala Divya and Sreeja

In this challenge, we use regular expressions (RegEx) to remove instances of words that are repeated more than once, but retain the *first occurrence* of any case-insensitive repeated word. For example, the words love and to are repeated in the sentence I love Love to To tO code. Can you complete the code in the editor so it will turn I love Love to To tO code into I love to code?

To solve this challenge, complete the following three lines:

- 1. Write a RegEx that will match any repeated word.
- 2. Complete the second compile argument so that the compiled RegEx is case-insensitive.
- 3. Write the two necessary arguments for *replaceAll* such that each repeated word is replaced with the very first instance the word found in the sentence. It must be the *exact* first occurrence of the word, as the expected output is case-sensitive.

Note: This challenge uses a custom checker; you will fail the challenge if you modify anything other than the three locations that the comments direct you to complete. To restore the editor's original stub code, create a new buffer by clicking on the branch icon in the top left of the editor.

Input Format

The following input is handled for you the given stub code:

The first line contains an integer, denoting the number of sentences. Each of the subsequent lines contains a single sentence consisting of English alphabetic letters and whitespace characters.

Constraints

Each sentence consists of at most English alphabetic letters and whitespaces.

Output Format

Stub code in the editor prints the sentence modified by the *replaceAll* line to stdout. The modified string must be a modified version of the initial sentence where all repeat occurrences of each word are removed.

Sample Input

Goodbye bye bye world world world

Sam went went to to to his business

Reya is is the the best player in eye eye game

in inthe

Hello hello Ab aB

Sample Output

Goodbye bye world

Sam went to his business

Reya is the best player in eye game

in inthe

Hello Ab

Explanation

- 1. We remove the second occurrence of bye and the second and third occurrences of world from Goodbye bye bye world world world to get Goodbye bye world.
- 2. We remove the second occurrence of went and the second and third occurrences of to from Sam went went to to to his business to get Sam went to his business.
- 3. We remove the second occurrence of is, the second occurrence of the, and the second occurrence of eye from Reya is is the the best player in eye eye game to get Reya is the best player in eye game.
- 4. The sentence in inthe has no repeated words, so we do not modify it.
- 5. We remove the second occurrence of ab from Hello hello Ab aB to get Hello Ab. It's important to note that our matching is *case-insensitive*, and we specifically retained the *first occurrence* of the matched word in our final string.

13. Sindhu and Sankya

Rahul is a 15 years old boy. He bought a new laptop. He likes to password protect his laptop, So help Rahul to generate a password for his laptop and validate the password by writing a Java program.

Requirements:

Hint to generate a password:

• Minimum of 6 characters and a maximum of 12 characters (characters include alphabets, numbers and special characters).

- The password should contain atleast one uppercase, one lowercase, and one special character
- Only these special characters @,\$,*,# are allowed
- keeping numbers in the password is optional.
- If the password fails the above condition, print "<password> is an invalid password" and terminate the program

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided.

Please do not use System.exit(0) to terminate the program

Sample Input/Output 1

Generate your password

#001Lord

The generated password #001Lord is valid and has 3 lowercase alphabet 1 uppercase alphabet 1 special character 3 digit

Sample Input/Output 2

Generate your password

LIVE@123

LIVE@123 is an invalid password

14. Akshay and Sneha

Sharpx private company is conducting a conference, for which the participants need to preregister. After completing the registration they will get an ID. By using the ID they can enter the conference hall. So help Sharpx private company to validate the ID issued to the participants.

Requirements:

- The ID should have exactly ten characters.
- The format of the ID is "SPC00105PM".
- The first 3 characters of the ID should be "SPC", which determines the company name.

- The next 3 characters should be digits, it determines the seat number.
- The last 4 characters should determine the time of the conference.
- Of the last four characters, the first 2 digits indicate time, it should be greater than 0 and less than or equal to 12.
- The next two characters are time zone. It should be either "AM" or "PM".
- If the input does not match with the above condition, print "<ID> is an Invalid ID" and terminate the program.

Note:

- In the Sample Input / Output provided, the highlighted text in bold corresponds to the input given by the user, and the rest of the text represents the output.
- Ensure to follow the object-oriented specifications provided in the question description.
- Ensure to provide the names for classes, attributes, and methods as specified in the question description.
- Adhere to the code template, if provided.

Please do not use System.exit(0) to terminate the program

Sample Input/Output 1:

Enter your name

Aravind

Enter your ID

SPC01004PM

Hi Aravind your seat number is 10 and the event starts at 4PM

Sample Input/Output 2:

Enter your name

Snekha

Enter your ID

SPA01004PM

SPA01004PM is an Invalid ID

Sample Input/Output 3:

Enter your name

Jin

Enter your ID

SPC01004HM

SPC01004HM is an Invalid ID

15. Ruchitha and Fathima

Write a class called *MyRegex* which will contain a string pattern. You need to write a regular expression and assign it to the pattern such that it can be used to validate an IP address. Use the following definition of an IP address:

IP address is a string in the form "A.B.C.D", where the value of A, B, C, and D may range from 0 to 255. Leading zeros are allowed. The length of A, B, C, or D can't be greater than 3.

Some valid IP address:

000.12.12.034

121.234.12.12

23.45.12.56

Some invalid IP address:

000.12.234.23.23

666.666.23.23

.213.123.23.32

23.45.22.32.

I.Am.not.an.ip

In this problem you will be provided strings containing any combination of ASCII characters. You have to write a regular expression to find the valid IPs.

Just write the MyRegex class which contains a String. The string should contain the correct regular expression.

(MyRegex class MUST NOT be public)

Sample Input

000.12.12.034

121.234.12.12

23.45.12.56

00.12.123.123123.123

122.23

Hello.IP

Sample Output

true			
true			
true			
false			
false			
false			

16. Navya Sri and Supraja

Using **Regex**, we can easily match or search for patterns in a text. Before searching for a pattern, we have to specify one using some well-defined syntax.

In this problem, you are given a pattern. You have to check whether the syntax of the given pattern is valid.

Note: In this problem, a regex is only valid if you can compile it using the <u>Pattern.compile</u> method.

Input Format

The first line of input contains an integer, denoting the number of test cases. The next lines contain a string of any printable characters representing the pattern of a regex.

Output Format

For each test case, print Valid if the syntax of the given pattern is correct. Otherwise, print Invalid. Do not print the quotes.

Sample Input

3

([A-Z])(.+)

[AZa-z

batcatpat(nat

Sample Output

Valid

Invalid

Invalid

17. Prathuysha and G. Divya

Given a string, , matching the regular expression [A-Za-z !,?._'@]+, split the string into *tokens*. We define a token to be one or more consecutive English alphabetic letters. Then, print the number of tokens, followed by each token on a new line.

Note: You may find the <u>String.split</u> method helpful in completing this challenge.

Input Format

A single string, .

Constraints

•

• is composed of *any* of the following: English alphabetic letters, blank spaces, exclamation points (!), commas (,), question marks (?), periods (.), underscores (_), apostrophes ('), and at symbols (@).

Output Format

On the first line, print an integer, , denoting the number of tokens in string (they *do not* need to be unique). Next, print each of the tokens on a new line in the same order as they appear in input string.

Sample Input

He is a very very good boy, isn't he?

Sample Output

10

He

is

а

very

very

good

boy

isn

t

he

Explanation

We consider a token to be a contiguous segment of alphabetic characters. There are a total of such tokens in string, and each token is printed in the same order in which it appears in string.