1. Write a Java program that will take a String as input and convert the lowercase letters to the uppercase letters. The program should keep the other characters (i.e. uppercase letters and symbols) unchanged. *[You are not allowed to use .toUpperCase( ) to solve the problem]*

Sample Input	Output
JavaProgrammer123++	JAVAPROGRAMMER123++
I am a hungry coder!	I AM A HUNGRY CODER!

2. Write a Java program to check if a string is palindrome or not. A string is palindrome if the reverse of the string is the same as the original string. *[You cannot use any built-in functions other than .equals( ), .charAt( ), .length( )]*

Given String	Output
madam	true
racecar	true
Abracadabra	false

3. Write a Java program that splits a given string on a given split character. The first input is a String and the second input is the character that will be used to split the first String.

Sample Input	Sample Output
I-love-Java -	I love Java
tom@gmail,harry@yahoo,bob@gmail ,	tom@gmail harry@yahoo bob@gmail **Explanation:** The second input which is the character ',' is used to split the first input string 'tom@gmail,harry@yahoo, bol@gmail,mary@gmail' into four separate email addresses.

4. Write a JAVA program that will take one string input from the user. Then prints the string in reverse.

Sample Input	Output
ABCD	DCBA
Hello!	!olleH

5. Captain Jack and his crew have discovered a treasure chest full of gold coins. However, the chest comes with a mysterious lock. To open it, they need to input a phrase that should contain a combination of characters where vowel count is divisible by 3 and consonant count is divisible by 5. Write a Java program to help Captain Jack determine if the input phrase has the correct number of vowels and consonants to unlock the treasure chest.

Note: Vowels and Consonants count has to be greater than 0 for the treasure to open

Sample Input	Output
Yo-hoo-hoo!	Blimey! No Plunder!! **Explanation:** The input string has five vowels 'o, o, o, o, o' which is not divisible by 3 and the same applies for consonant rules as well where count of consonants is not divisible by 5. Hence the chest cannot be opened.
Yo-ho-Ya-ho-hoo!	Aaarr! Me Plunder!! **Explanation:** The input string has six vowel count which is divisible by 3 and the same applies for consonant rules as well where count of consonants is divisible by 5. Hence the chest can be opened.
aoouii-uii	Blimey! No Plunder!!

	Explanation: Here the vowel count is divisible by 3, but the consonant count being 0 resulted in the chest not being opened.

6. Write a Java program that takes a string as input and reverses the order of words in it.

Sample Input	Output
CSE110 is easy	easy is CSE110
Attention please!	please! Attention

7. Write a Java program that takes two strings (lowercase) as user input. Your task is to concat the two strings except the common characters present in the strings. Then print the modified string (uppercase). You can assume that each string will only contain unique characters; that means there will be no duplicate characters in a particular string.

Sample Input	Output
abcd bdgc	AG
arose rail	OSEIL

8. Write a Java program that takes a sentence as user input and displays the sentence in aLtErNaTiNg CaPs format. Note that, you have to ignore spaces and other punctuations while altering the characters. Also, your new sentence will always start with lowercase letters.

Sample Input	Output
Hello World!	hElLo WoRlD!
I love Java String Problems. Those are easy.	i LoVe JaVa StRiNg PrObLeMs. ThOsE aRe EaSy.

9. Write a Java program that takes a string as input and determines whether the string qualifies as a strong password. A strong password is defined by the following criteria:

- The password must be at least 8 characters long.
- The password must contain characters at least one -
  - Uppercase letters (A-Z)
  - Lowercase letters (a-z)
  - Digits (0-9)
  - Special characters (e.g., !, @, #, $, etc.)

Print **'True'** if the password is strong, and **'False'** otherwise. You may consider any character excluding the alphabet, digit, and space as special characters.

Sample Input	Output
StrongPass123!	True
Weak123	False

Quiz questions

1. amader 3 ta string input nite hobe. Prothom duita hobe alphabet
and 3rd string ta hobe integar. For example s1= abcd s2= efgh s3=
1234
Amader Protita string er 1st 2 characters print korte hobe and I guess
sob gulare jora dewa lagbe to give output ab12ef

2. amader ekta string chilo and etate capital letter and small letter
mix kora chilo. String er length odd number howa lagbe. 1st half print
kora lagbe and then 2nd half print kora lagbe. Last e 1st half er
jegula capital letter chilo segula print kora lagbe.

For example: s1= AbCdEfGhI   1st half= AbCdE   2nd half= fGhI
3rd output hobe ACE

3. Duita string nite hobe ar ekta integar
Sample input
abcdefgh
12345678
Output
ab12cd34ef56gh78

2. Write a Java program that has a given string and prints a compressed version of the string by counting the consecutive occurrences of each character.

Given string	Output
aabcccccaaa	a2b1c5a3
aArr	a1A1r2

5. Write a Java program to remove duplicate characters from a given string that appeared in another given string.

Given String	Output
Given String 1: The patient had died before the doctor came. **Given String 2:** hospital	e en d ded befre e dcr cme.
Given String 1: THERE is no EEE LAB in 9 th Floor. **Given String 2:** Table	HR is no in 9 h Foor.

7. Write a Java program that will take two Strings as user input and print the number of times the second String occurs in the first String.

Sample Input	Output
str1 = "She sells sea shells on the sea shore." str2 = "se"	Occurrence: 3 times
str1 = "Fox ran over the box." str2 = "ox"	Occurrence: 2 times

1)

Question 1 (String)

Write a Java program that receives a String value from the user:

- Print the last 2 characters as output.
- Find how many characters does this String value has?
- Change the letters of the given input to uppercase letters and print it.
- Change the letters of the given input to lowercase letters and print it.
- Compare two strings (uppercase and lowercase) by using ignoring case. Print the value returned by the function i.e. true/false.
- Find the first occurrence of letter 'a' and print its index. (At the runtime, evaluate what happens if the string does not have an 'a' in it.)
- Concatenate the given string with "-cmpe113-" print the new value, evaluate the length of new string.
- Print the substring which is composed of: first white space, the character before white space and the character after white space.

Sample Output (with "My favorite programming language is Java." entry)

```
Please enter a String:
My favorite programming language is Java.
Last two characters in your entry is: a.
Your entry has: 41 characters
The UPPERCASE value of the string you entered is: MY FAVORITE PROGRAMMING LANGUAGE
IS JAVA.
The lowercase value of the string you entered is: my favorite programming language
is java.
Are they equal? true
Index of character 'a' in your entry is: 4
The strings are concatenated: My favorite programming language is Java.-cmpe113-
It's length becomes: 50
y f
```

Part II: Strings

Question 1 [25 points]:

Write a Java program which reads a String composed of one or many words and prints out the number of words that starts or ends with the letter 'e' or 'E'.

Sample Run 1:
Enter a string: I like Ecology even in summer
Number of words that starts with e or ends with e is: 3

Sample Run 2:
Enter a string: Eat the healthy food only
Number of words that starts with e or ends with e is: 2

Write a Java program which reads a string from the user and calls a method *findVowels()* from the *main()* method which passes the string as argument and prints the number of occurrences of each vowel (i.e., a, e, i, o, and u) present in that string. Read the string from the user using the *Scanner* class.   **(10 points)**

Sample input:
The quick brown fox jumps over the lazy dog

Sample output:
a: 1
e: 3
i: 1
o: 4
u: 2

Sample input:
Merry Christmas!

Sample output:
a: 1
e: 1
i: 1
o: 0
u: 0

Exercise #2: Write a java program that prompts the user to enter a sentence. The program has to find the print:

    a. the position of vowels in the sentence.
    b. the number of vowels in the sentence (A, a, U, u, E, e, O, o, I, i)
    c. the number of characters as numbers or special characters (other than English letters a..z, A..Z). *Hint: remember to ignore the spaces.*

Sample input-output:

Enter the sentnse: **UAEU is the university of the future #2018**
The locations of vowels are: 0 1 2 3 5 10 12 14 16 19 23 28 31 33 35
The number of vowels is: 15
The number of characters as numbers or special characters is: 5

5)

Q1. String Comparison

Please write a java code for the following instructions (10 Points):

- Ask the user to enter his/her name (10 Points).
- Be sure that the entered name length is greater than one. Otherwise, give a warning and exit from the code (10 points).
- Check whether the name's first two characters are the same as yours. If they are the same, then give another message (10 points).
- Test your Java code for all the cases (10 points) :
  - One character length name entrance.
  - The name whose first two characters are the same as your name
  - The name whose first two characters are NOT the same as your name

Question 1

Write a Java program that provides searching a specific character in a string.
To do it;

    a) The user firstly should enter a string. The string should be converted to a character array.
    b) The program asks the user which character to search for in the character array.
    c) Return index(s) of the search character which is occurred in the array.

Sample Outputs

```
Please enter a string : ted university
Which character do you want to search for : e
This character is occured in " 1 8 " index(s).
```
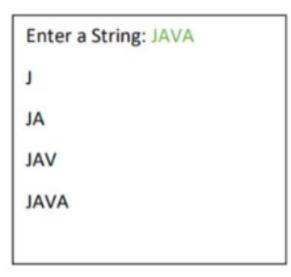
```
Please enter a string : Life is beautiful
Which character do you want to search for : i
This character is occured in " 1 5 13 " index(s).
```

7)

Question 1

Write a Java program using nested *for* loops that takes a string value from user and prints a pattern according to it.

Sample Outputs:

Enter a String: hello	Enter a String: JAVA
h	J
he	JA
hel	JAV
hell	JAVA
hello	

Part B: Duplicate Letters?

Given a word, determine if that word has any duplicate letters present.
(You only need **one** loop to solve this problem, you do not need nested loops. If you write nested loops it will be considered wrong.) (Use your String toolbox!)

Sample Run 1:
Text: supercalifragilisticexpialidocious

supercalifragilisticexpialidocious has duplicate letters.

Sample Run 2:
Text: violet

violet has no letters duplicated.

9)2. Use nested loops to create this design:

A
AB
ABC
ABCD
ABCDE
ABCDEF

2. Use nested loops to create this design:

ABCDEF

ABCDE

ABCD

ABC

AB

A

10)

str is a String object.

Write Java statements that prints the characters of str with index increments of 3 with a space after each character.

I.e. characters with indexes 0, 3, 6, 9, ... will be printed.

(Example: if str="Antalya", then output will be "A a a ")

(Example: if str="008 Jane Bond", then output will be "0 n B d ")

Write only the Java statements that performs the above described task, nothing else.

11)

Lab Exercise 2 – More String Operations

Problem Description:

Write a Java program (**StringOperations2.java**) that performs some operations on the following strings (String **s1** = "Ali", String **s2** = "Magdi", String **s3** = "[[]]").

- Compare **s1** and **s2** to find out which one comes first in alphabetical order,
- Create a new string that is string **s2** in the middle of the string **s3**,
- Create a new string that is the first char of **s1** and the last char of **s2**,
- Print out the string of length **3** from the middle of string **s2**.

Sample output:

```
Magdi comes before Ali
 [[Magdi]]
AM
agd
```

Steps for Alphabetical Comparison:

1. Compare the characters of both strings at the same index.
   - If the character in the first string (s1) is smaller than the character in the second string (s2), s1 comes first.
   - If the character in s1 is greater than the character in s2, s2 comes first.
2. If all characters are the same up to the length of the shorter string, then the shorter string comes first.
3. If no difference is found and the lengths are the same, the strings are equal

12)

Write a Java program that performs the following tasks. The program should work on an English sentence entered by the user.

1. Ask the user to enter an English sentence (S).

2. Perform the following operations directly in the main program:

   - Find the length of the string (both with and without spaces).
   - Count the number of vowels in the string, and change the vowels to uppercase in the original sentence.
   - Count the number of words in the string.
   - Print the sentence with vowels in uppercase.
   - Print the sentence in reverse order, where the words are in reverse order but their internal character positions remain the same.

3. Finally, display the results of the above operations, including:

- The original sentence.

- The sentence length (with and without spaces).

- The number of vowels in the sentence.

- The sentence with uppercase vowels.

- The number of words.

- The sentence with words in reverse order.

Example:

Input:

Enter English sentence: Welcome to java programming

Output:

Entered Sentence: Welcome to java programming

Sentence Length with spaces: 27

Sentence Length without spaces: 24

Number of vowels: 9

Sentence with uppercase vowels: wElcOmE tO jAvA prOgrAmmIng

Number of words: 4

Words in reverse: emocleW ot avaj gnimmargorp

13)Count and Replace Vowels in a Sentence

Write a program that:

1. Takes a sentence as input.
2. Counts the number of vowels.
3. Replaces all vowels with an asterisk *.

Example:

```
Input: "Replace vowels in this sentence"

Output:

Number of Vowels: 10

Modified Sentence: "R*pl*c* v*w*ls *n th*s s*nt*nc*"
```