Hands On Assignment
1. Write a program to accept two string inputs. The first being a source string and second one a delimiter. The source string contains the delimiter at various locations. Your job is to return the substring with maximum number of characters. If two or more substrings have maximim number of characters return the substring which appears first. The size of the delimiter is 1. Include a class UserMainCode with a static method extractMax which accepts the string. The return type (string) should be the max substring. Create a Class Main which would be used to accept Input string and call the static method present in UserMainCode.
2. Write code to get two strings as input and If strings are of same length simply append them together and return the final string. If given strings are of different length, remove starting characters from the longer string so that both strings are of same length then append them together and return the final string. Include a class UserMainCode with a static method concatstring which accepts two string input. The return type of the output is a string which is the concatenated string. Create a class Main which would get the input and call the static method concatstring present in the UserMainCode.
3. Given a String as input , write a program to count and print the number of unique characters in it. Include a class UserMainCode with a static method ?checkUnique? that accepts a String as input and returns the number of unique characters in it. If there are no unique characters in the string, the method returns -1. Create a class Main which would get a String as input and call the static method checkUnique present in the UserMainCode.

4. Write a program to read an int array of odd length, compare the first, middle and the last elements in the array and return the largest. If there is only one element in the array return the same element.

Include a class UserMainCode with a static method checkLargestAmongCorner which accepts an int arrayThe return type (integer) should return the largest element among the first, middle and the last elements.

Create a Class Main which would be used to accept Input array and call the static method present in UserMainCode.

Assume maximum length of array is 20.

5. Write a program to read an array of strings and return an arraylist which consists of words whose both first and last characters are vowels. Assume all inputs are in lowecase.

Include a class UserMainCode with a static method matchCharacter which accepts a string array. The return type shoud be an arraylist which should contain elements as mentioned above.

Create a Class Main which would be used to accept Input array and call the static method present in UserMainCode.

6. Given a method with string input. Write code to remove vowels from even position in the string.

Include a class UserMainCode with a static method removeEvenVowels which accepts a string as input.

The return type of the output is string after removing all the vowels.

Create a Main class which gets string as an input and call the static method removeEvenVowels present in the UserMainCode.

7. Write a program to read a string and a character, and reverse the string and convert it in a format such that each character is separated by the given character. Print the final string.
Include a class UserMainCode with a static method reshape which accepts a string and a character. The return type (String) should return the final string.

Create a Class Main which would be used to accept a string and a character, and call the static method present in UserMainCode.

8. Write a Program which removes duplicate characters from the string. Your program should read a sentence (string) as input from user and return a string removing duplicate characters. Retain the first occurance of the duplicate character. Assume the characters are case ? sensitive.

Include a class UserMainCode with a static method removeDuplicates which accepts a string. The return type is the modified sentence of type string.

Create a Class Main which would be used to accept the input string and call the static method present in UserMainCode.

9. Write a program to read a sentence as a string and store only the last letter of each word of the sentence in capital letters separated by $. Print the final string.

Include a class UserMainCode with a static method getLastLetter which accepts a string. The return type (string) should return the final string.
Create a Class Main which would be used to read a string, and call the static method present in UserMainCode.

10. Given a method taking an odd positive Integer number as input. Write code to evaluate the following series:
1+3-5+7-9?+/-n.

Include a class UserMainCode with a static method addSeries which accepts a positive integer .

The return type of the output should be an integer .

Create a class Main which would get the input as a positive integer and call the static method addSeries present in the UserMainCode.

11. Write a program to check whether the two given strings are anagrams.

Note: Rearranging the letters of a word or phrase to produce a new word or phrase, using all the original letters exactly once is called Anagram."

Include a class UserMainCode with a static method ?getAnagram? that accepts 2 strings as arguments and returns an int. The method returns 1 if the 2 strings are anagrams. Else it returns -1.

Create a class Main which would get 2 Strings as input and call the static method getAnagram present in the UserMainCode.

12. Write a program to read a date as string (MM-dd-yyyy) and return the day of week on that date.

Include a class UserMainCode with a static method getDay which accepts the string. The return type (string) should be the day of the week.

Create a Class Main which would be used to accept Input string and call the static method present in UserMainCode.

13. Write a program to read an integer array and remove all 10s from the array, shift the other elements towards left and fill the trailing empty positions by 0 so that the modified array is of the same length of the given array.

Include a class UserMainCode with a static method removeTens which accepts the number of elements and an integer array. The return type (Integer array) should return the final array. Create a Class Main which would be used to read the number of elements and the input array, and call the static method present in UserMainCode.

14. Write a program to read a number , calculate the sum of squares of even digits (values) present in the given number.

Include a class UserMainCode with a static method sumOfSquaresOfEvenDigits which accepts a positive integer . The return type (integer) should be the sum of squares of the even digits.

Create a class Main which would get the input as a positive integer and call the static method sumOfSquaresOfEvenDigits present in the UserMainCode.

15. Write a program to read a string of even length and to fetch two middle most characters from the input string and return it as string output.

Include a class UserMainCode with a static method getMiddleChars which accepts a string of even length as input . The return type is a string which should be the middle characters of the string.

Create a class Main which would get the input as a string and call the static method getMiddleChars present in the UserMainCode.

16.Write a program to read a string and to test whether first and last character are same. The string is said to be be valid if the 1st and last character are the same. Else the string is said to be invalid.

Include a class UserMainCode with a static method checkCharacters which accepts a string as input .
The return type of this method is an int. Output should be 1 if the first character and last character are same . If they are different then return -1 as output.

Create a class Main which would get the input as a string and call the static method checkCharacters present in the UserMainCode.

17. Write a program to read a positive number as input and to get the reverse of the given number and return it as output.

Include a class UserMainCode with a static method reverseNumber which accepts a positive integer .

The return type is an integer value which is the reverse of the given number.

Create a Main class which gets the input as a integer and call the static method reverseNumber present in the UserMainCode

18. Write a program to read a sentence in string variable and convert the first letter of each word to capital case. Print the final string.
Note: - Only the first letter in each word should be in capital case in final string.
Include a class UserMainCode with a static method printCapitalized which accepts a string. The return type (String) should return the capitalized string.

Create a Class Main which would be used to accept a string and call the static method present in UserMainCode.

19. Write a program to read an array, eliminiate duplicate elements and calculate the sum of even numbers (values) present in the array.

Include a class UserMainCode with a static method addUniqueEven which accepts a single integer array. The return type (integer) should be the sum of the even numbers. In case there is no even number it should return -1.

Create a Class Main which would be used to accept Input array and call the static method present in UserMainCode.

20. Write a program to input two integers, which corresponds to the lower limit and upper limit respectively, and find the sum of all palindrome numbers present in the range including the two numbers. Print the sum.

Include a class UserMainCode with a static method addPalindromes which accepts two integers. The return type (Integer) should return the sum if the palindromes are present, else return 0.

Create a Class Main which would be used to accept two integer and call the static method present in UserMainCode.

Note1 : A palindrome number is a number which remains same after reversing its digits.
Note2 : A single digit number is not considered as palindrome.
Input and Output Format:

21. Write a program to check if a given string is palindrome and contains at least two different vowels.

Include a class UserMainCode with a static method checkPalindrome which accepts a string. The return type (integer) should be 1 if the above condition is satisfied, otherwise return -1.

Create a Class Main which would be used to accept Input string and call the static method present in UserMainCode.

Note : Case Insensitive while considering vowel, i.e a & A are same vowel, But Case sensitive while considering palindrome i.e abc CbA are not palindromes.

22. Obtain two strings from user as input. Your program should modify the first string such that all the characters are replaced by plus sign (+) except the characters which are present in the second string.

That is, if one or more characters of first string appear in second string, they will not be replaced by +.

Return the modified string as output. Note - ignore case.

Include a class UserMainCode with a static method replacePlus which accepts two string variables. The return type is the modified string.

Create a Class Main which would be used to accept two Input strings and call the static method present in UserMainCode.

23. Write a program to read a string and validate PAN no. against following rules:
1. There must be eight characters.
2. First three letters must be alphabets followed by four digit number and ends with alphabet
3. All alphabets should be in capital case.

Print ?Valid? if the PAN no. is valid, else print ?Invalid?.

Include a class UserMainCode with a static method validatePAN which accepts a string. The return type (Integer) should return 1 if the string is a valid PAN no. else return 2.

Create a Class Main which would be used to accept a string and call the static method present in UserMainCode.

24. Given an input as string and write code to encrypt the given string using following rules and return the encrypted string:

1. Replace the characters at odd positions by next character in alphabet.
2. Leave the characters at even positions unchanged.

Note:
- If an odd position charater is 'z' replace it by 'a'.
- Assume the first character in the string is at position 1.

Include a class UserMainCode with a static method encrypt which accepts a string.

The return type of the output is the encrypted string.

Create a Main class which gets string as an input and call the static method encrypt present in the UserMainCode.

25. Write a code get a password as string input and validate using the rules specified below. Apply following validations:

1. Minimum length should be 8 characters
2. Must contain any one of these three special characters @ or _ or #
3. May contain numbers or alphabets.
4. Should not start with special character or number
5. Should not end with special character

Include a class UserMainCode with a static method validatePassword which accepts password string as input and returns an integer. The method returns 1 if the password is valid. Else it returns -1.

Create a class Main which would get the input and call the static method validatePassword present in the UserMainCode.

26. Write a program to calculate the sum of all the non prime positive numbers less than or equal to the given number.

Note: prime is a natural number greater than 1 that has no positive divisors other than 1 and itself

Example:
input = 9
Prime numbers = 2,3,5 and 7
output = 1+4+6+8+9=28

Include a class UserMainCode with a static method ?addNumbers? that accepts an integer arguement and returns an integer.

Create a class Main which would get an integer as input and call the static method validateNumber present in the UserMainCode.

27. Write a program to read a two strings and one int value(N). check if Nth character of first String from start and Nth character of second String from end are same or not. If both are same return true else return false.
Check need not be Case sensitive
Include a class UserMainCode with a static method isEqual which accepts the two strings and a integer n. The return type is the TRUE / FALSE.
Create a Class Main which would be used to read the strings and integer and call the static method present in UserMainCode

28. Write a program to read an integer and find the sum of all odd numbers from 1 to the given number. [inclusive of the given number]

if N = 9 [1,3,5,7,9]. Sum = 25

Include a class UserMainCode with a static method addOddNumbers which accepts the number n. The return type is the integer based on the problem statement.

Create a Class Main which would be used to accept the integer and call the static method present in UserMainCode.

29. Write a program to read a string containing date in DD/MM/YYYY format and check if its a leap year. If so, return true else return false.

Include a class UserMainCode with a static method isLeapYear which accepts the string. The return type is the boolean indicating TRUE / FALSE.

Create a Class Main which would be used to accept the string and call the static method present in UserMainCode.

30. Write a program to read a String and check if that String contains all the vowels. Print “yes” if the string contains all vowels else print “no”.
Include a class UserMainCode with a static method getVowels which accepts a string. The return type (integer) should return 1 if the String contains all vowels else return -1.

Create a Class Main which would be used to accept Input String and call the static method present in UserMainCode.

31. Given a phone number as a string input, write a program to verify whether the phone number is valid using the following business rules:
-It should contain only numbers or dashes (-)
-dashes may appear at any position
-Should have exactly 10 digits

32. Given a string, startIndex and length, write a program to extract the substring from right to left. Assume the last character has index 0.

33. Given `an int array as input, write a program to compute the average of the maximum and minimum element in the array.`

34. Write a program to read a integer array, find the largest difference between adjacent elements and display the index of largest difference.
EXAMPLE:
input1: {2,4,5,1,9,3,8}
output1: 4 (here largest difference 9-1=8 then return index of 9 ie,4)

35. Write a program to read a string and return a new string which is made of every alternate characters starting with the first character. For example NewYork will generate Nwok, and Samurai will generate Smri.

36. Write a program to read two integer arrays and find the sum of common elements in both the arrays. If there are no common elements return -1 as output

37. Write a program to get an int array as input and identify even and odd numbers. If number is odd get cube of it, if number is even get square of it. Finally add all cubes and squares together and return it as output.

Include a class UserMainCode with a static method addEvenOdd which accepts integer array as input.

The return type of the output is an integer which is the sum of cubes and squares of elements in the array.

Create a class Main which would get the input and call the static method addEvenOdd present in the UserMainCode.

38. Write a program to read a non-negative integer n, and find sum of fibonanci series for n number..

39. Write a program to input a String and a character, and remove that character from the given String. Print the final string.
Include a class UserMainCode with a static method removeCharacter which accepts a string and a character. The return type (string) should return the character cleaned string.

Create a Class Main which would be used to accept Input String and call the static method present in UserMainCode.

40. Write a program to read a string and validate the given ISBN as input.
Validation Rules:
1. An ISBN (International Standard Book Number) is a ten digit code which uniquely identifies a book.
2. To verify an ISBN you calculate 10 times the first digit, plus 9 times the second digit, plus 8 times the third ..all the way until you add 1 times the last digit.
If the final number leaves no remainder when divided by 11 the code is a valid ISBN.
Example 1:
Input:0201103311
Calculation: 10*0 + 9*2 + 8*0 + 7*1 + 6*1 + 5*0 + 4*3 + 3*3 + 2*1 + 1*1 = 55.
55 mod 11 = 0
Hence the input is a valid ISBN number
Output: true
Include a class UserMainCode with a static method validateISBN which accepts the string. The return type is TRUE / FALSE as per problem.
Create a Class Main which would be used to accept the string and call the static method present in UserMainCode.