**Problem Statement 1: Arrays API**

**1. Write a program that takes a String through Command Line argument and display the length of the string. Also display the string into uppercase and check whether it is a palindrome or not.**

public class Arraypalindrome {

public static void isPalindrome(String str) {

String pal = "";

for(int i=str.length()-1; i>=0; i--) {

pal += str.charAt(i);

}

System.out.println("String in uppercase: "+str);

System.out.println("Length of string: "+str.length());

if(pal.equals(str)) {

System.out.println(pal+" is palindrome");

}else {

System.out.println(pal+" is not palindrome");

}

}

public static void main(String[] args) {

for(int i=0; i<args.length; i++) {

isPalindrome(args[i]);

}

}

}

**Output:**

Microsoft Windows [Version 10.0.19045.5247]

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C:\Users\epavan.reddy>cd desktop

C:\Users\epavan.reddy\Desktop>**javac Arraypalindrome.java**

C:\Users\epavan.reddy\Desktop>java Arraypalindrome.java

error: class found on application class path: Arraypalindrome

C:\Users\epavan.reddy\Desktop>**java Arraypalindrome sai**

**String in uppercase: sai**

**Length of string: 3**

**ias is not palindrome**

C:\Users\epavan.reddy\Desktop>**java Arraypalindrome madam**

**String in uppercase: madam**

**Length of string: 5**

**madam is palindrome**

**2. Write a program that accepts two numbers in the range from 1 to 40 from the Command Line. Then compares these numbers against a single dimension array of five integer elements ranging in value from 1 to 40. The program displays the message “Bingo” if the two inputted values are found in the array element. For example:**

input> java prob3 3 29

output> Your first number was 3

Your second number was 29

Its Bingo! // this message if 3 and 29 is found in the array

Not Found! // this message if 3 and 29 is not found in the array

The array was 7 25 5 19 30

package day3assignment;

import java.util.Scanner;

public class Bingo {

int first,second;

int arr[] = { 7,25,5,19,30};

void input() {

Scanner sc = new Scanner(System.in);

System.out.println("enter first number:");

first = sc.nextInt();

System.out.println("enter second number:");

second = sc.nextInt();

}

public void check() {

if ((first >40 ||first <0)&&(second >40 || second <0)){

System.out.println("please enter numbres between 1 to 40");

return ;

}

int count = 0;

for (int i = 0; i < arr.length; i++) {

if (arr[i] == first || arr[i] == second) {

count++;

}

}

if (count == 2) {

System.out.println("Bingo");

} else {

System.out.println("not found");

}

}

public static void main(String[] args) {

Bingo bo = new Bingo();

bo.input();

bo.check();

}

}

**Output:**

Microsoft Windows [Version 10.0.19045.5247]

(c) Microsoft Corporation. All rights reserved.

C:\Users\epavan.reddy>cd desktop

C:\Users\epavan.reddy\Desktop>**javac Bingo.java**

C:\Users\epavan.reddy\Desktop>**java Bingo.java**

**enter first number:**

**45**

**enter second number:**

**55**

**please enter numbers between 1 to 40**

C:\Users\epavan.reddy\Desktop>**java Bingo.java**

**enter first number:**

**25**

**enter second number:**

**7**

**Bingo**

C:\Users\epavan.reddy\Desktop>**java Bingo.java**

**enter first number:**

**1**

**enter second number:**

**2**

**not found**

**3. Write a program that allows you to create an integer array of 18 elements with the following values:**

**int A[] = {3, 2, 4, 5, 6, 4, 5, 7, 3, 2, 3, 4, 7, 1, 2, 0, 0, 0}. Perform the following computations,**

**• Compute the sum of elements from index 0 to 14 and stores it at element 15.**

**• Compute the average of all numbers and stores it at element 16.**

**• Identifies the smallest value from the array and stores it at element 17.**

**package** day3assignment;

**public** **class** Array {

**public** **static** **void** main(String[] args) {

**int** A[]= {3, 2, 4, 5, 6, 4, 5, 7, 3, 2, 3, 4, 7, 1, 2, 0, 0, 0};

**int** sum=0;

**for**(**int** i=0;i<15;i++) {

sum+=A[i];

}

A[15]=sum;

**int** totalsum=0;

**for**(**int** i=0;i<A.length;i++) {

totalsum+=A[i];

}

**int** average=totalsum/A.length;

A[16]=average;

**int** smallestValue = A[0];

**for** (**int** i = 1; i < A.length; i++) {

**if** (A[i] < smallestValue) {

smallestValue = A[i];

}

}

A[17] = smallestValue;

System.***out***.println("the sum upto a[14]:"+A[15]);

System.***out***.println("the average of array:"+A[16]);

System.***out***.println("The modified array is:");

**for** (**int** i = 0; i < A.length; i++) {

System.***out***.print(A[i] + " ");

}

}

}

**Output:**

the sum upto a[14]:58

the average of array:6

The modified array is:

3 2 4 5 6 4 5 7 3 2 3 4 7 1 2 58 6 0

**4. Jaffer was done with the online shopping, and the next step was to complete the bill payment, for which he must provide his name, credit card number, expiry month/year and CVV code. The system**

**should validate the inputs as mentioned below:**

**• Inputs cannot be empty if so, provide appropriate messages.**

**• Credit Card Number, expiry month/year and CVV code must be numeric.**

**• Credit card should be 16 characters long and include a dash (-) after each four-digit number.**

**• CVV Code should be of length 3.**

**• The month and year in which the card will expire should be displayed as MM/YY. Below are the inputs and expected output to be used and displayed are depicted in the screenshots.**

package day3assignment;

import java.util.Scanner;

public class Creditcard {

String name;

String cardno,cvv,expairydate;

void input() {

Scanner sc = new Scanner(System.*in*);

System.*out*.println("enter name:");

name = sc.next();

System.*out*.println("enter cardno:");

cardno = sc.next();

System.*out*.println("enter cvv no:");

cvv = sc.next();

System.*out*.println("enter expairydate: ");

expairydate = sc.next();

}

public void check() {

if (name.isEmpty()) {

System.*out*.println("Name cannot be empty.");

} else if (!cardno.matches("\\d{4}-\\d{4}-\\d{4}-\\d{4}")) {

System.*out*.println("Invalid card number. It should be in the format 1234-5678-9101-1121.");

} else if (!cvv.matches("\\d{3}")) {

System.*out*.println("Invalid CVV. It must be 3 digits.");

} else if (!expairydate.matches("(0[1-9]|1[0-2])/[0-9]{2}")) {

System.*out*.println("Invalid expiry date. Use MM/YY format.");

} else {

System.*out*.println("details entered are");

System.*out*.println("========================================");

System.*out*.println("Name: " + name);

System.*out*.println("Card number: " + cardno);

System.*out*.println("Expairy date: " + expairydate);

}

}

public static void main(String[] args) {

Creditcard cc = new Creditcard();

cc.input();

cc.check();

}

}

**Output:**

enter name:

sai

enter cardno:

1234-5678-9012-3456

enter cvv no:

324

enter expairydate:

12/30

details entered are

========================================

Name: sai

Card number: 1234-5678-9012-3456

Expairy date: 12/30

**5.**import java.util.Random;

interface MedicineInfo{

void displayLable();

}

class Tablet implements MedicineInfo{

@Override

public void displayLable(){

System.out.println("Name:Cipla");

System.out.println("Address:No. 117/1 & 118/1, Anjanadri Building,Nayandanahalli, Pantarapalya, Mysore Road, Bengaluru, Karnataka 560039, Bengaluru, Karnataka 560039");

System.out.println("Tablet:Store in cold and dry place");

}

}

class Syrup implements MedicineInfo{

@Override

public void displayLable(){

System.out.println("Name:Cipla");

System.out.println("Address:No. 117/1 & 118/1, Anjanadri Building,Nayandanahalli, Pantarapalya, Mysore Road, Bengaluru, Karnataka 560039, Bengaluru, Karnataka 560039");

System.out.println("Syrup:Shake well before use");

}

}

class Ointment implements MedicineInfo{

@Override

public void displayLable(){

System.out.println("Name:Cipla");

System.out.println("Address:No. 117/1 & 118/1, Anjanadri Building,Nayandanahalli, Pantarapalya, Mysore Road, Bengaluru, Karnataka 560039, Bengaluru, Karnataka 560039");

System.out.println("Ointments:For external use only");

}

}

//import java.util.Random;

public class TestMedicine {

public static void main(String[] args) {

MedicineInfo[] medicines = new MedicineInfo[10];

Random rand = new Random();

for (int i = 0; i < medicines.length; i++) {

int choice = rand.nextInt(3) + 1;

switch (choice) {

case 1:

medicines[i] = new Tablet();

break;

case 2:

medicines[i] = new Syrup();

break;

case 3:

medicines[i] = new Ointment();

break;

}

}

for (int i = 0; i < medicines.length; i++) {

System.out.print("Medicine " + (i + 1) + ": ");

medicines[i].displayLable();

}

}

}

**6. Sort the given array in descending order, i.e., arrange the elements from largest to smallest.**

package day3assignment;

import java.util.Scanner;

public class Descarray {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.println("enter the length of array:");

int n =sc.nextInt();

Integer[] array = new Integer[n];

System.*out*.println("enter elements of array:");

for(int i=0;i<n;i++) {

array[i]=sc.nextInt();

}

for (int i = 0; i < n - 1; i++) {

for (int j = 0; j < n - 1 - i; j++) {

if (array[j] < array[j + 1]) {

int temp = array[j];

array[j] = array[j + 1];

array[j + 1] = temp;

}

}

}

System.*out*.println("Sorted array in descending order:");

for (int i = 0; i < n; i++) {

System.*out*.print(array[i] + " ");

}

}

}

**Output:**

enter the length of array:

7

enter elements of array:

2

6

23

98

24

35

78

Sorted array in descending order: [98, 78, 35, 24, 23, 6, 2]

**7. Given a sorted array arr[] of size N, the task is to remove the duplicate elements from the array.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Removeduplicatesinarray {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("enter array length:");

**int** n = sc.nextInt();

System.***out***.println("enter array values:");

**int** arr[] = **new** **int**[n];

**for**(**int** i=0;i<n;i++) {

arr[i]=sc.nextInt();

}

**int** j=1;

**for**(**int** i=1;i<n;i++) {

**if**(arr[i]!=arr[i-1]) {

arr[j]=arr[i];

j++;

}

}

System.***out***.println("The modified array is:");

**for** (**int** i = 0; i <j; i++) {

System.***out***.print(arr[i] + " ");

}

}

}

**Output:**

enter array length:

9

enter array values:

1 2 2 3 4 4 4 5 5

The modified array is:

1 2 3 4 5

**8. Given two arrays and our task is to find their common elements.**

import java.util.\*;

public class SameElements{

public static void main (String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("enter 1st array elements:");

String input1=sc.nextLine();

String [] arr1=input1.split(",");

System.out.println("enter 2nd array elements:");

String input2=sc.nextLine();

String [] arr2=input2.split(",");

System.out.println("Common elements: ");

findCommonElements(arr1, arr2);

}

public static void findCommonElements(String[] arr1, String[] arr2) {

for (int i = 0; i < arr1.length; i++) {

for (int j = 0; j < arr2.length; j++) {

if (arr1[i].trim().equalsIgnoreCase(arr2[j].trim())) {

System.out.println(arr1[i]);

break;

}

}

}

}

}

**Input:**

enter 1st array elements:

apple,for,article,and,grapes

enter 2nd array elements:

grape,apple,article

**output:**

Common elements:

apple

article

**Input:**

enter 1st array elements:

a,b,c,d,e,f

enter 2nd array elements:

b,d,e,h,g,c

**output:**

Common elements:

b

c

d

e

import java.util.Arrays;

import java.util.Comparator;

import java.util.Scanner;

public class Sort2DArrayByColumn {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the number of rows (N): ");

int N = scanner.nextInt();

System.out.print("Enter the number of columns (M): ");

int M = scanner.nextInt();

int[][] array = new int[N][M];

System.out.println("Enter the elements of the 2D array:");

for (int i = 0; i < N; i++) {

for (int j = 0; j < M; j++) {

array[i][j] = scanner.nextInt();

}

}

System.out.print("Enter the column number (K) to sort by (1 <= K <= M): ");

int K = scanner.nextInt();

sortByColumn(array, K);

System.out.println("Sorted 2D array based on column " + K + ":");

for (int i = 0; i < N; i++) {

for (int j = 0; j < M; j++) {

System.out.print(array[i][j] + " ");

}

System.out.println();

}

scanner.close();

}

public static void sortByColumn(int[][] array, int K) {

int columnIndex = K - 1;

Arrays.sort(array, new Comparator<int[]>() {

@Override

public int compare(int[] row1, int[] row2) {

return Integer.compare(row1[columnIndex], row2[columnIndex]);

}

});

}

}

import java.util.\*;

public class Transpose {

public static void main(String args[]) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the no.of rows and colums: ");

int rows = sc.nextInt();

int columns = sc.nextInt();

int arr[][] = new int[rows][columns];

System.out.print("Enter "+rows+"x"+columns+" matrix: ");

for(int i=0; i<rows; i++) {

for(int j=0; j<columns; j++) {

arr[i][j] = sc.nextInt();

}

}

System.out.println("Your matrix is: ");

for(int i=0; i<rows; i++) {

for(int j=0; j<columns; j++) {

System.out.print(arr[i][j]+" ");

}

System.out.println();

}

System.out.println("Transposed matrix is: ");

for(int i=0; i<columns; i++) {

for(int j=0; j<rows; j++) {

System.out.print(arr[j][i]+" ");

}

System.out.println();

}

}

}

import java.util.Scanner;

public class BoundaryElementsMatrix {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter number of rows: ");

int rows = scanner.nextInt();

System.out.print("Enter number of columns: ");

int cols = scanner.nextInt();

int[][] matrix = new int[rows][cols];

System.out.println("Enter the elements of the matrix:");

for (int i = 0; i < rows; i++) {

for (int j = 0; j < cols; j++) {

matrix[i][j] = scanner.nextInt();

}

}

System.out.println("Boundary elements in matrix format:");

printBoundaryElements(matrix, rows, cols);

scanner.close();

}

public static void printBoundaryElements(int[][] matrix, int rows, int cols) {

for (int i = 0; i < rows; i++) {

for (int j = 0; j < cols; j++) {

if (i == 0 || i == rows - 1 || j == 0 || j == cols - 1) {

System.out.print(matrix[i][j] + " ");

} else {

System.out.print(" ");

}

}

System.out.println();

}

}

}

import java.util.Scanner;

public class Main {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter the no.of rows and colums: ");

int n = sc.nextInt();

int m = sc.nextInt();

int sumPD = 0;

int sumSD = 0;

int arr[][] = new int[n][m];

System.out.println("Enter "+n+"x"+m+" matrix: ");

for(int i=0; i<n; i++){

for(int j=0; j<m; j++){

arr[i][j] = sc.nextInt();

}

}

for(int i=0; i<n; i++){

for(int j=0; j<m; j++){

if(i==j){

sumPD = sumPD + arr[i][j];

}

if(i+j == (n-1)){

sumSD = sumSD + arr[i][j];

}

}

}

System.out.println("Sum of principal diagonal matrix: "+sumPD);

System.out.println("Sum of secondary diagonal matrix: "+sumSD);

}

}

**Problem Statement 2: String Classes**

**13. Write a program that takes String as input and count the last ‘n’ vowels of a given String. If the number is greater than the vowels found, then print ‘Mismatch in Vowel Count**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Vowelscount {

**int** n;

String str;

**void** input() {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("enter a string:");

str=sc.nextLine();

System.***out***.println("enter no.of vowels:");

n=sc.nextInt();

String str1="";

**int** count=0;

**for**(**int** i=str.length()-1;i>=0;i--) {

**char** ch=str.charAt(i);

**if**(ch=='a'||ch=='e'||ch=='i'||ch=='o'||ch=='u'||ch=='A'||ch=='E'||ch=='I'||ch=='O'||ch=='U') {

str1=str1+ch;

count++;

}

**if**(count==n) {

**break**;

}

}

**if**(count!=n) {

System.***out***.println("mismatched vowels");

}**else** {

System.***out***.println("the vowels in given string:"+str1);

}

}

**public** **static** **void** main(String[] args) {

Vowelscount vc =**new** Vowelscount();

vc.input();

}

}

**Output:**

enter a string:

sai

enter no.of vowels:

2

the vowels in given string:ia

**14. Write a Java Program to reverse a string.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Reversestring {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("enter a string:");

String reverse="";

String str=sc.nextLine();

**for**(**int** i=str.length()-1;i>=0;i--) {

reverse +=str.charAt(i);

}

System.***out***.println("the reversed string is:"+reverse);

}

}

**Output:**

enter a string:

sai

the reversed string is:ias

**15. Write the Java Program to Sort a String.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Sortedstring {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("enter a string:");

String str = sc.nextLine();

**char**[] charArray=str.toCharArray();

**for**(**int** i=0;i<charArray.length;i++) {

**for**(**int** j=0;j<charArray.length-i-1;j++) {

**if**(charArray[j]>charArray[j+1]) {

**char** temp=charArray[j];

charArray[j]=charArray[j+1];

charArray[j+1]=temp;

}

}

}

System.***out***.println("the sorted string:"+**new** String(charArray));

}

}

**Output:**

enter a string:

javaprogram

the sorted string:aaagjmoprrv

**16. Given string str, the task is to write a Java program to swap the pairs of characters of a string. If the string contains an odd number of characters, then the last character remains as it is.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Sweapstring {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("enter a string:");

String str = sc.nextLine();

**char**[] charArray=str.toCharArray();

**for**(**int** i=0;i<charArray.length-1;i+=2) {

**char** temp=charArray[i];

charArray[i]=charArray[i+1];

charArray[i+1]=temp;

}

System.***out***.println("the sweaped string:"+**new** String(charArray));

}

}

**Output:**

enter a string:

java

the sweaped string:ajav

enter a string:

Testing

the sweaped string:eTtsnig

**17. Given string str, the task is to write Java Program check whether the given string is a pangram or not. A string is a pangram string if it contains all the character of the alphabets ignoring the case of the alphabets.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Panogram {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("Enter a string:");

String str = sc.nextLine().toLowerCase();

String alphabet = "abcdefghijklmnopqrstuvwxyz";

**for** (**int** i = 0; i < alphabet.length(); i++) {

**if** (str.indexOf(alphabet.charAt(i)) == -1) {

System.***out***.println("No");

**return**;

}

}

System.***out***.println("Yes");

}

}

**Output:**

Enter a string:

Welcome

No

Enter a string:

The quick brown fox jumps over the lazy dog

Yes

**18. Write the java program to extract the first letter of each word in it.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Firstletter {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("enter a string:");

String str = sc.nextLine();

String result="";

**int** i =0;

**int** length=str.length();

**while**(i<length) {

**while**(i<length && str.charAt(i)==' ') {

i++;

}

**if**(i<length) {

result +=str.charAt(i);

}

**while**(i<length && str.charAt(i)!=' ') {

i++;

}

}

System.***out***.println(result);

}

}

**Output:**

enter a string:

Practice Java Program

PJP

enter a string:

United Kingdom

UK

**19. Given a String, the task is to insert another string in between the given String at a particular specified index in Java.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Insertstring {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

String ogstr = "Computer Program";

String strtoinsert = " Science";

**int** index = 8;

**if**(index<0||index>ogstr.length()) {

System.***out***.println("index is invalid");

}**else** {

String result=ogstr.substring(0,index)+strtoinsert+ogstr.substring(index);

System.***out***.println("the final string:"+result);

}

}

}

**Output:**

the final string:Computer Science Program

**20. Write a Java program to print Even length words in a String.**

**package** day3assignment;

**import** java.util.Scanner;

**public** **class** Evenstring {

**public** **static** **void** main(String[] args) {

Scanner sc = **new** Scanner(System.***in***);

System.***out***.println("enter a string");

String str = sc.nextLine();

String[] str1=str.split(" ");

**for**(String word : str1) {

**if**(word.length()%2==0) {

System.***out***.println(word);

}

}

}

}

**Output:**

enter a string

This is a java language

This

is

java

language

**output:**

enter a string

i am Tester

am

Tester