**DAY -3 ASSIGNMENT**

**BASIC OF JAVA**

**Problem Statement 1: Arrays API**

**Problem Number : 1**

StringOperation Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** StringOperation {

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

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

System.***out***.println("Enter String");

String s = sc.nextLine();

System.***out***.println(s + " : length is : " + s.length());

System.***out***.println(s + " The Upper Case is : " + s.toUpperCase());

**if** (*isPalimdrome*(s).equals(s))

System.***out***.println(s + ": is a Palindrme");

**else**

System.***out***.println(s + ": is a not Palindrme");

}

**private** **static** String isPalimdrome(String s) {

String rev = "";

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

rev = s.charAt(i) + rev;

}

**return** rev;

}

}

**Problem Number : 2**

BingoOrNot Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** BingoOrNot {

**private** **static** **boolean** isBingo(**int**[] arr, **int** n1, **int** n2) {

**boolean** b1 = **false**, b2 = **false**;

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

**if** (n1 == arr[i])

b1 = **true**;

**if** (n2 == arr[i])

b2 = **true**;

}

**return** (b1 == **true** && b2==**true**);

}

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

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

System.***out***.println("Enter Length");

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

System.***out***.println("Enter List of Numbers ");

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

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

arr[i] = sc.nextInt();

System.***out***.println("Enter First Searching Element");

**int** n1 = sc.nextInt();

System.***out***.println("Enter Second Searching Element");

**int** n2 = sc.nextInt();

**if** (*isBingo*(arr, n1, n2)!=**false**)

System.***err***.println("Its Bingo");

**else**

System.***err***.println("Not Found");

}

}

**Problem Number : 3**

ArrayOperation Class

**package** org.software.com;

**import** java.util.Iterator;

**public** **class** ArrayOperation {

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

**int** arr[] = { 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 <= 14; i++)

sum = sum + arr[i];

arr[15] = sum;

sum = 0;

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

sum = sum + arr[i];

**int** avg = sum / arr.length;

arr[16] = avg;

**int** a = arr[0];

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

**if** (a > arr[i])

a = arr[i];

}

arr[17] = a;

System.***out***.println("Array Elements : ");

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

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

}

}

}

**Problem Number : 4**

Card Class

**package** org.software.com;

**public** **class** Card {

**public** String name;

**public** **long** ccn;

**public** **int** expMonth;

**public** **int** expYear;

**static** String formatCardNumber(**long** num) {

String numStr = Long.*toString*(num);

StringBuilder ccn = **new** StringBuilder();

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

ccn.append(numStr.charAt(i));

**if** ((i + 1) % 4 == 0 && i != numStr.length() - 1) {

ccn.append("-");

}

}

**return** ccn.toString();

}

**public** Card(String name, **long** ccn, **int** expMonth, **int** expYear, **int** cvv) {

**if** (name != **null** && !name.isEmpty() && isValidCardNumber(ccn) && isValidExpiryMonth(expMonth) && isValidExpiryYear(expYear) && isValidCVV(cvv)) {

**this**.name = name;

**this**.ccn = ccn;

**this**.expMonth = expMonth;

**this**.expYear = expYear;

**this**.cvv = cvv;

} **else** {

**throw** **new** IllegalArgumentException("Invalid Data Entry");

}

}

**private** **boolean** isValidCardNumber(**long** ccn) {

**return** Long.*toString*(ccn).matches("\\d{16}");

}

**private** **boolean** isValidExpiryMonth(**int** month) {

**return** month >= 1 && month <= 12;

}

**private** **boolean** isValidExpiryYear(**int** year) {

**return** year > 0;

}

**private** **boolean** isValidCVV(**int** cvv) {

**return** Integer.*toString*(cvv).length() == 3;

}

}

TestCard Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** TestCard {

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

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

System.***out***.println("Enter Your Name");

String name = sc.nextLine();

System.***out***.println("Enter Card Number (16 digits without dashes)");

**long** ccn = sc.nextLong(); // Changed to long

System.***out***.println("Enter Month (MM format)");

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

System.***out***.println("Enter Year (YY format)");

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

System.***out***.println("Enter CVV (3 digits)");

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

**try** {

Card card = **new** Card(name, ccn, month, year, cvv);

System.***out***.println("Details Entered Are : ");

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

System.***out***.println("Card Number : " + Card.*formatCardNumber*(card.ccn));

System.***out***.println("Expiry Date : " + card.expMonth + "/" + card.expYear);

} **catch** (IllegalArgumentException e) {

System.***err***.println(e.getMessage());

}

}

}

**Problem Number : 5**

MedicineInfo Interface

**package** org.software.com;

**interface** MedicineInfo {

**void** displayLabel();

}

Tablet Class

**package** org.software.com;

**class** Tablet **implements** MedicineInfo {

**public** **void** displayLabel() {

System.***out***.println("Type : Tablet");

System.***out***.println("Company : Ventus Pharma");

System.***out***.println("Address : Pune, India");

System.***out***.println("Note : Store in a cool dry place.");

}

}

Syrup Class

**package** org.software.com;

**class** Syrup **implements** MedicineInfo {

**public** **void** displayLabel() {

System.***out***.println("Type : Syrup");

System.***out***.println("Company : Sun Pharmaceutical Industries");

System.***out***.println("Address : Goregaon, Mumbai, India");

System.***out***.println("Note : Store it Properly");

}

}

Ointment Class

**package** org.software.com;

**class** Ointment **implements** MedicineInfo {

**public** **void** displayLabel() {

System.***out***.println(" Type : Ointment");

System.***out***.println("Company: Lupin Limited");

System.***out***.println("Address : Mumbai, India");

System.***out***.println("Note : For External use Only.");

}

}

TestMedicine Class

**package** org.software.com;

**import** java.util.Random;

**public** **class** TestMedicine {

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

MedicineInfo[] medicines = **new** MedicineInfo[10];

Random random = **new** Random();

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

**int** medicineType = random.nextInt(3) + 1;

**if** (medicineType == 1) {

medicines[i] = **new** Tablet();

} **else** **if** (medicineType == 2) {

medicines[i] = **new** Syrup();

} **else** **if** (medicineType == 3) {

medicines[i] = **new** Ointment();

}

}

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

medicines[i].displayLabel();

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

}

}

}

**Problem Number :6**

ArrayDescendingOrder Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** ArrayDescendingOrder {

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

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

System.***out***.println("Enter length of Array");

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

**int** a[] = **new** **int**[length];

System.***out***.println("Enter Array Elements");

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

a[i] = sc.nextInt();

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

**int** maxIdx = i;

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

**if** (a[j] > a[maxIdx]) {

maxIdx = j;

}

}

**int** temp = a[maxIdx];

a[maxIdx] = a[i];

a[i] = temp;

}

System.***out***.print("Enter Descending Order Elements : ");

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

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

}

}

}

**Problem Number :7**

RemoveDuplicate Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** RemoveDuplicate {

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

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

System.***out***.println("Enter Length of Array");

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

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

System.***out***.println("Enter Array Elements");

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

arr[i] = sc.nextInt();

}

**int** b[] = arr;

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

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

**if** (arr[i] == b[j]) {

b[j] = Integer.***MIN\_VALUE***;

}

}

}

System.***out***.println("Unique values:");

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

**if** (b[i] != Integer.***MIN\_VALUE***) {

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

}

}

}

}

**Problem Number :8**

PrintDuplicateElements Class

**package** org.software.com;

**import** java.util.\*;

**public** **class** PrintDuplicateElements {

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

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

System.***out***.println("Enter Array One Size : ");

**int** len1 = sc.nextInt();

System.***out***.println("Enter Array Two Size : : ");

**int** len2 = sc.nextInt();

String arr1[] = **new** String[len1];

String arr2[] = **new** String[len2];

System.***out***.println("Enter First Array String Elements : ");

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

arr1[i] = sc.next();

System.***out***.println("Enter Second Array String Elements : ");

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

arr2[j] = sc.next();

HashSet<String> set = **new** HashSet<>();

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

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

**if** (arr1[i].equals(arr2[j])) {

**if** (set.contains(arr1[i]) == **false**) {

set.add(arr1[i]);

}

}

}

}

System.***out***.println("The Repeated Values are : "+set);

}

}

**Problem Number :9**

ArraySortMatrix Class

**package** org.software.com;

**import** java.util.HashMap;

**import** java.util.Map;

**import** java.util.Scanner;

**import** java.util.TreeMap;

**public** **class** ArraySortMatrix {

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

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

System.***out***.println("Enter Columns : ");

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

System.***out***.println("Enter Rows : ");

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

**int**[][] arr = **new** **int**[col][row];

System.***out***.println("Enter Numbers : ");

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

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

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

}

}

Map<Integer, Integer> map = **new** HashMap<>();

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

**int** sum = 0;

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

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

}

map.put(sum, i);

}

Map<Integer, Integer> sortbyKey = **new** TreeMap<>(map);

**for** (Integer index : sortbyKey.values()) {

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

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

}

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

}

}

}

**Problem Number :10**

TransposeMatrix Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** TransposeMatrix {

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

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

System.***out***.println("Enter No of Columns");

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

System.***out***.println("Enter No of Rows");

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

**int** arr[][] = **new** **int**[col][row];

System.***out***.println("Enter Elements");

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

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

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

}

}

System.***out***.println("Before Transpose");

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

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

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

}

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

}

*toTranspose*(arr, col, row);

}

**private** **static** **void** toTranspose(**int**[][] arr, **int** col, **int** row) {

**int** a[][] = **new** **int**[row][col];

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

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

a[j][i] = arr[i][j];

}

}

System.***out***.println("After Transpose");

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

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

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

}

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

}

}

}

**Problem Number :11**

BoundaryElements Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** BoundaryElements {

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

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

System.***out***.println("Enter No of Columns");

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

System.***out***.println("Enter No of Rows");

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

**int** arr[][] = **new** **int**[col][row];

System.***out***.println("Enter Elements");

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

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

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

}

}

System.***out***.println("Before Transpose");

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

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

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

}

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

}

*toPrint*(arr, col, row);

}

**private** **static** **void** toPrint(**int**[][] arr, **int** col, **int** row) {

System.***out***.println("The Result Is : ");

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

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

**if**(i==0 || i==col-1 || j==0 || j==row-1)

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

**else**

System.***out***.print(" ");

}

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

}

}

}

**Problem Number :12**

DiagonalElementsSum Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** DiagonalElementsSum {

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

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

System.***out***.println("Enter No of Columns");

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

System.***out***.println("Enter No of Rows");

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

System.***out***.println("Enter values");

**int** arr[][] = **new** **int**[col][row];

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

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

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

}

}

System.***out***.println("The Sums are : ");

**int** pDia = 0, sDia = 0;

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

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

**if** (i == j) {

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

}

**if** (i + j == row-1) {

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

}

}

}

System.***out***.println("Principal Diagonal : "+pDia);

System.***out***.println("Principal Diagonal : "+sDia);

}

}

**Problem Statement 2: String Classes**

**Problem Number :13**

VowelCountLastN Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** VowelCountLastN {

**static** String toCountVowel(String str) {

StringBuilder vowels = **new** StringBuilder();

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

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

**if** (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u' ||

c == 'A' || c == 'E' || c == 'I' || c == 'O' || c == 'U') {

vowels.append(c);

}

}

**return** vowels.toString();

}

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

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

System.***out***.println("Enter String:");

String str = sc.nextLine();

System.***out***.println("Enter Number:");

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

String vowels = *toCountVowel*(str);

**if** (num > vowels.length()) {

System.***out***.println("Mismatch in Vowel Count");

} **else** {

String lastNVowels = vowels.substring(vowels.length() - num);

System.***out***.println("Last " + num + " vowels: " + lastNVowels);

}

}

}

**Problem Number :14**

ReverseString Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** ReverseString {

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

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

System.***out***.println("Enter String :");

String string = sc.nextLine();

String str = "";

**for** (**int** j = string.length() - 1; 0 <= j; j--) {

str = str + string.charAt(j);

}

System.***out***.println("The Reverse String is : "+str);

}

}

**Problem Number :15**

StringSort Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** StringSort {

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

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

System.***out***.println("Enter String :");

String string = sc.nextLine();

String s = string.toLowerCase();

String str="";

**for** (**int** i = 97; i <= 122; i++) {

**char** c = (**char**) i;

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

**if**(c==s.charAt(j)) {

str=str+s.charAt(j);

}

}

}

System.***out***.println("The Sorted String is");

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

}

}

**Problem Number :16**

SwapTwoPlace Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** SwapTwoPlace {

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

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

System.***out***.println("Enter String :");

String string = sc.nextLine();

String str="",s="";

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

s=string.charAt(i)+s;

**if**(i%2!=0 || (i==string.length()-1 && (i%2==0))) {

str=str+s;

s="";

}

}

System.***out***.println("The Output is : "+str);

}

}

**Problem Number :17**

PangramOrNot Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** PangramOrNot {

**private** **static** String toCheck(String s) {

**for** (**int** i = 97; i <= 122; i++) {

**char** c = (**char**) i;

**if** (s.contains(c + "") != **true**) {

**return** "No";

}

}

**return** "Yes";

}

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

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

System.***out***.println("Enter String :");

String string = sc.nextLine();

String s = string.toLowerCase();

System.***out***.println(*toCheck*(s));

}

}

**Problem Number :18**

FirstLetter Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** FirstLetter {

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

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

System.***out***.println("Enter Sentence :");

String string=sc.nextLine();

String s[]=string.split(" ");

String str="";

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

str=str+s[i].charAt(0);

}

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

}

}

**Problem Number :19**

AddWordInBetween Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** AddWordInBetween {

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

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

System.***out***.println("Enter Sentence :");

String str = sc.nextLine();

System.***out***.println("Enter String :");

String strInsert = sc.nextLine();

System.***out***.println("Enter Index Number :");

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

String s=str.substring(0, index)+" "+strInsert+" "+str.substring(index, str.length());

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

}

}

**Problem Number :20**

EvenString Class

**package** org.software.com;

**import** java.util.Scanner;

**public** **class** EvenString {

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

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

System.***out***.println("Enter Sentence :");

String str=sc.nextLine();

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

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

**if**(s[i].length()%2==0)

System.***out***.println(s[i]);

}

}

}