# Input Output Statements

## Triwizard Tournament – 1

**Main.java:**

**import** java.util.Scanner;

**public** **class** Main {

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

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

**int** input = in.nextInt();

System.*out*.println("Harry has to swim at "+input+" meters and must rescue "+input+" sea maidens.");

}

}

## Triwizard Tournament – 2

**Main.java:**

**import** java.util.Scanner;

**public** **class** Main {

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

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

**double** input = in.nextDouble();

String str = String.*format*("%.2f",input);

System.*out*.println("Harry has got :\nProf.Dumbledore must get the wand worth $"+str+".");

}

}

## Triwizard Tournament - 3

**Main.java:**

**import** java.util.Scanner;

**public** **class** Main {

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

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

            Double value = input.nextDouble();

            String string = String.*format*("%.2f", value);

            System.*out*.println("Harry has got :\nProf.Dumbledore must get the wand worth $"+ string+".");

      }

}

## Triwizard Tournament - 4

**Main.java:**

**import** java.util.Scanner;

**public** **class** Main {

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

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

            String name = input.next();

            System.*out*.println("Fang says :\nHagrid must choose the cracker with name \""+name+"\".");

      }

}

## Triwizard Tournament – 5

**Main.java:**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Word in the Trophy :");

String name = in.next();

System.*out*.println("Malfoy picks the character :");

String ch = in.next();

System.*out*.println("Malfoy replaces the character with :");

String chRep = in.next();

System.*out*.println("Hedwig must replace "+chRep+" with "+ch+" in the word "+name+".");

}

}

# Operators and Expressions

## Profit and Loss

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the number of dozens of toys purchased");

**int** numDozens = in.nextInt();

System.*out*.println("Enter the price per dozen");

**int** price = in.nextInt();

System.*out*.println("Enter the selling price of 1 toy");

**int** toyPrice = in.nextInt();

**double** cost = price/12.0;

**double** profit = toyPrice - cost;

**double** profitPercent = profit/cost\*100;

String str = String.*format*("%.2f", profitPercent);

System.*out*.println("Sam's profit percentage is "+str+" percent");

}

}

## Time and Work

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the value of x");

**int** x = in.nextInt();

**double** b = (3/2.0)\*x;

**double** a = b-x;

**double** ab = 1/((1/a) + (1/b));

String str = String.*format*("%.2f",ab);

System.*out*.println("Working together, A and B can complete the work in "+str+" days");

}

}

## Average

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the number of overs bowled so far");

**int** overs = in.nextInt();

System.*out*.println("Enter the current run rate");

**double** curRunrate = in.nextDouble();

System.*out*.println("Enter the target score");

**int** target = in.nextInt();

**double** curRuns = (overs\*curRunrate);

**double** reqRuns = target - curRuns;

**double** reqRunrate = reqRuns/(50-overs);

String str = String.*format*("%.2f",reqRunrate);

System.*out*.println("Required run rate is "+str);

}

}

## Radius of a Circle

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the sides of a triangle");

**int** a = in.nextInt();

**int** b = in.nextInt();

**int** c = in.nextInt();

**double** k = (a+b+c)/2.0;

**double** radius = Math.*sqrt*((k\*(k-a)\*(k-b)\*(k-c)))/k;

String str = String.*format*("%.2f", radius);

System.*out*.println("The radius of the circle is "+str);

}

}

## Pogo Stick Jumps

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the X and Y coordinate of friend's house");

**int** x = in.nextInt();

**int** y = in.nextInt();

**double** temp = (x-3)\*(x-3)+(y-4)\*(y-4);

**double** jumps = Math.*sqrt*(temp);

**double** noJumps = Math.*ceil*(jumps);

String str = String.*format*("%.0f",noJumps);

System.*out*.println("Raju needs "+str+" jumps");

}

}

## Discount

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Price of item 1 :");

**double** price1 = in.nextDouble();

System.*out*.println("Price of item 2 :");

**double** price2 = in.nextDouble();

System.*out*.println("Discount in percentage :");

**double** discountPercent = in.nextDouble();

**double** totalPrice = price1 + price2;

**double** savings = totalPrice\*(discountPercent/100);

**double** discountedAmount = totalPrice-savings;

String disStr = String.*format*("%.2f",discountedAmount);

String totStr = String.*format*("%.2f",totalPrice);

String savStr = String.*format*("%.2f",savings);

System.*out*.println("Total amount : $"+totStr);

System.*out*.println("Discounted amount : $"+disStr);

System.*out*.println("Saved amount : $"+savStr);

}

}

# Conditional Statements

## Compare 2 integers

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the first number");

**int** num1 = in.nextInt();

System.*out*.println("Enter the second number");

**int** num2 = in.nextInt();

**if**(num1>num2){

System.*out*.println(num1+" is greater than "+num2);

}

**else** **if**(num1<num2){

System.*out*.println(num1+" is less than "+num2);

}

**else** **if**(num1==num2){

System.*out*.println(num1+" is equal to "+num2);

}

}

}

## Vowel or Consonant

**public** **class** Main {

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

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

System.*out*.println("Enter a character");

**char** ch = in.next().charAt(0);

**if**((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')){

**switch**(ch){

**case** 'a':

**case** 'A':

**case** 'e':

**case** 'E':

**case** 'i':

**case** 'I':

**case** 'o':

**case** 'O':

**case** 'u':

**case** 'U':

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

**break**;

**default**:

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

}

}

**else**{

System.*out*.println("Not an alphabet");

}

}

}

## Grade

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the marks");

**int** mark = in.nextInt();

String grade;

**if**(mark>100 || mark<0){

System.*out*.println("Invalid Input");

}

**else**{

**if**(mark==100){

grade = "S";

}

**else** **if**(mark>=90 && mark<100){

grade = "A";

}

**else** **if**(mark>=80 && mark<90){

grade = "B";

}

**else** **if**(mark>=70 && mark<80){

grade = "C";

}

**else** **if**(mark>=60 && mark<70){

grade = "D";

}

**else** **if**(mark>=50 && mark<60){

grade = "E";

}

**else**{

grade = "F";

}

System.*out*.println("The student obtained a "+grade+" grade");

}

}

}

## Profit or Loss

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the price of a dozen mangoes");

**double** dozenPrice = in.nextDouble();

System.*out*.println("Enter the price at which 1 mango is being sold");

**double** onePrice = in.nextDouble();

**double** profit = (onePrice\*12) - dozenPrice;

**if**(profit>0){

String str = String.*format*("%.2f", Math.*abs*(profit));

System.*out*.println("Profit : Rs."+str);

}

**else** **if**(profit<0){

String str = String.*format*("%.2f", Math.*abs*(profit));

System.*out*.println("Loss : Rs."+str);

}

**else**{

System.*out*.println("No profit nor loss");

}

}

}

## Fee Collection

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the student type");

String studentType = in.next();

System.*out*.println("Enter tuition fee");

**double** tutionFee = in.nextDouble();

System.*out*.println("Enter bus fee");

**double** busFee = in.nextDouble();

System.*out*.println("Enter hostel fee");

**double** hostelFee = in.nextDouble();

**double** fee=0;

**if**(studentType.equalsIgnoreCase("MSDS")){

fee = tutionFee + busFee;

}

**else** **if**(studentType.equalsIgnoreCase("MSH")){

fee = tutionFee + hostelFee;

}

**else** **if**(studentType.equalsIgnoreCase("MGSDS")){

fee = (tutionFee\*1.5) + busFee;

}

**else** **if**(studentType.equalsIgnoreCase("MGSH")){

fee = (tutionFee\*1.5) + hostelFee;

}

String str = String.*format*("%.2f",fee);

System.*out*.println("The fees to be paid by the student is Rs."+str);

}

}

## Lab Allocation 1

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** x = in.nextInt();

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

**int** y = in.nextInt();

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

**int** z = in.nextInt();

**if**(x<y && x<z){

System.*out*.println("L1 has the minimal seating capacity");

}

**else** **if**(y<x && y<z){

System.*out*.println("L2 has the minimal seating capacity");

}

**else** **if**(z<x && z<y){

System.*out*.println("L3 has the minimal seating capacity");

}

}

}

## Lab Allocation 2

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** x = in.nextInt();

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

**int** y = in.nextInt();

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

**int** z = in.nextInt();

System.*out*.println("Enter the lab allocated for ACE training");

String lab = in.next();

**if**(lab.equalsIgnoreCase("L1")){

**if**(y<z){

System.*out*.println("L2 has the minimal seating capacity");

}

**else**{

System.*out*.println("L3 has the minimal seating capacity");

}

}

**if**(lab.equalsIgnoreCase("L2")){

**if**(x<z){

System.*out*.println("L1 has the minimal seating capacity");

}

**else**{

System.*out*.println("L3 has the minimal seating capacity");

}

}

**if**(lab.equalsIgnoreCase("L3")){

**if**(y<x){

System.*out*.println("L2 has the minimal seating capacity");

}

**else**{

System.*out*.println("L1 has the minimal seating capacity");

}

}

}

}

## Lab Allocation 3

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** x = in.nextInt();

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

**int** y = in.nextInt();

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

**int** z = in.nextInt();

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

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

**int** count = 0;

**if**(n>x && n>y && n>z){

System.*out*.println("None of the labs can accommodate "+n+" students");

}

**else**{

**if**(n<=x){

count++;

}

**if**(n<=y){

count++;

}

**if**(n<=z){

count++;

}

System.*out*.println(count+" lab(s) can accommodate "+n+" students");

}

}

}

## Lab Allocation 4

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** x = in.nextInt();

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

**int** y = in.nextInt();

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

**int** z = in.nextInt();

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

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

**if**(n>x && n>y && n>z){

System.*out*.println("None of the labs can be allocated");

}

**else**{

**int** x1 = ((x-n)>=0)?(x-n):2147483647;

**int** y1 = ((y-n)>=0)?(y-n):2147483647;

**int** z1 = ((z-n)>=0)?(z-n):2147483647;

**if**(x1<y1 && x1<z1){

System.*out*.println("L1 should be allocated to this class");

}

**else** **if**(y1<z1 && y1<x1){

System.*out*.println("L2 should be allocated to this class");

}

**else** **if**(z1<x1 && z1<y1){

System.*out*.println("L3 should be allocated to this class");

}

}

}

}

## Seat Allocation 1

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the number of rows");

**int** rows = in.nextInt();

System.*out*.println("Enter the number of columns");

**int** columns = in.nextInt();

System.*out*.println("Enter the roll number of the student");

**int** rollNum = in.nextInt();

**if**(rollNum<=columns || rollNum % columns == 1 || rollNum % columns == 0){

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

}

**else**{

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

}

}

}

## Seat Allocation 2

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the number of rows");

**int** rows = in.nextInt();

System.*out*.println("Enter the number of columns");

**int** columns = in.nextInt();

System.*out*.println("Enter the roll number of the student");

**int** rollNum = in.nextInt();

**if**(rollNum % rows == 1 || rollNum <= rows || rollNum >= ((rows\*columns)-rows)){

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

}

**else**{

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

}

}

}

## P2 – Green Lights

**import** java.util.Scanner;

**public** **class** Main {

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

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

**double** speed = in.nextDouble();

**double** distance = in.nextDouble();

**double** time = in.nextDouble();

**double** timeReq = (distance/speed)\*360;

**if**(timeReq-(time/10.0)>0){

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

}

**else**{

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

}

}

}

## P1 – Dining Table

**import** java.util.Scanner;

**public** **class** Main {

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

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

String door = in.next();

**int** rail = in.nextInt();

**if**(door.equalsIgnoreCase("front")){

**if**(rail == 1){

System.*out*.println("Left Handed");

}

**else**{

System.*out*.println("Right Handed");

}

}

**else**{

**if**(rail == 1){

System.*out*.println("Right Handed");

}

**else**{

System.*out*.println("Left Handed");

}

}

}

}

## Microwave Owen

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the number of items");

**int** noItems = in.nextInt();

System.*out*.println("Enter the single item heating time");

**double** timePerItem = in.nextDouble();

**if**(noItems>3){

System.*out*.println("Number of items is more");

}

**else** **if**(noItems == 2){

**double** totalTime = timePerItem\*1.5;

String str = String.*format*("%.2f",totalTime);

System.*out*.println("The recommended heating time is "+str);

}

**else** **if**(noItems == 3){

**double** totalTime = timePerItem\*2;

String str = String.*format*("%.2f",totalTime);

System.*out*.println("The recommended heating time is "+str);

}

**else** **if**(noItems == 1){

String str = String.*format*("%.2f", timePerItem);

System.*out*.println("The recommended heating time is "+str);

}

}

}

## Matinee Movie Tickets

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter your age");

**int** age = in.nextInt();

System.*out*.println("Enter show timing");

**double** showTime = in.nextDouble();

**double** price=0;

**if**(age>13){

**if**(showTime==13.30){

price = 5;

}

**else**{

price = 8;

}

}

**else** **if**(age<=13 && age>0){

**if**(showTime == 13.30){

price = 2;

}

**else**{

price = 4;

}

}

String str = String.*format*("%.2f",price);

System.*out*.println("The ticket price is $"+str);

}

}

# Looping Statements

## Factorial Number

**import** java.util.Scanner;

**public** **class** Main {

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

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

**int** factorial = in.nextInt();

**int** num = 1;

**int** flag = 0;

**int** i=1;

**while**((flag == 0)&& num<=factorial){

num = num\*i;

**if**(num == factorial){

flag = 1;

}

i++;

}

**if**(flag == 1){

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

}

**else**{

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

}

}

}

## Lucas Sequence

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** a=0;

**int** b=0;

**int** c=1;

**int** d;

String str = a+" "+b+" "+c;

**for**(**int** i=0;i<n-3;i++){

d=a+b+c;

str = str+" "+d;

a=b;

b=c;

c=d;

}

System.*out*.println(str);

}

}

## Fibonacci Number

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** a=-1;

**int** b=1;

**int** c = 0;

**int** flag = 0;

**while**(flag == 0 && c<=n){

c = a+b;

**if**(c == n){

flag = 1;

}

a=b;

b=c;

}

**if**(flag == 1){

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

}

**else**{

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

}

}

}

## Trendy Number

**import** java.util.Scanner;

**public** **class** Main {

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

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

**int** rem;

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

**if**((n<100 || n>999) && n>0){

System.*out*.println("Not a Trendy Number");

}

**else**{

n = n/10;

rem = n%10;

**if**(rem%3 == 0){

System.*out*.println("Trendy Number");

}

**else**{

System.*out*.println("Not a Trendy Number");

}

}

}

}

## Special Number

**import** java.util.Scanner;

**public** **class** Main {

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

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

**int** rem;

**int** sum = 0;

**int** product = 1;

**int** j;

**int** m = in.nextInt();

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

**if**((m>=10 || m<=99)&&(n>=10 || n<=99)){

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

rem = i%10;

j = i/10;

sum = rem + j;

product = rem \* j;

**if**((sum+product) == i){

System.*out*.println(i);

}

}

}

}

}

## Kaprekar Number

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** square = num\*num;

**int** temp = num;

**int** length = 0;

**int** right=0;

**int** j=1;

**int** rem;

**while**(temp>0){

temp = temp/10;

length++;

}

temp = square;

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

rem = temp%10;

right = right + rem\*j;

j= j \* 10;

temp = temp/10;

}

**if**((temp+right)==num){

System.*out*.println("Kaprekar Number");

}

**else**{

System.*out*.println("Not A Kaprekar Number");

}

}

}

## Target Practice

**import** java.util.Scanner;

**public** **class** Main {

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

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

**int** target = in.nextInt();

**int** turn;

**int** sum = 0;

**int** flag =0;

**int** count = 0;

**while**(flag == 0){

turn = in.nextInt();

sum = sum +turn;

count++;

**if**(sum >= target){

System.*out*.println("The number of turns is "+count);

flag = 1;

}

}

}

}

## Kid’s Home Work

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

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

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

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

}

System.*out*.println();

}

}

}

# Arrays and Strings

## Modulo

**import java.util.Arrays;**

**import java.util.Scanner;**

**public class Main {**

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

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

**int[] num = new int[10];**

**int[] rem = new int[10];**

**int count = 0;**

**int i;**

**for (i = 0; i < 10; i++) {**

**num[i] = in.nextInt();**

**rem[i] = num[i] % 42;**

**}**

**Arrays.sort(rem);**

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

**if (rem[i] != rem[i + 1]) {**

**count++;**

**}**

**}**

**count++;**

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

**}**

**}**

## Carry Operation

**import** java.util.Scanner;

**public** **class** Main {

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

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

**long** num1 = in.nextLong();

**long** num2 = in.nextLong();

**long** temp;

**long** carry = 0;

**long** count = 0;

**while**(num1!=0 || num2!=0){

temp = (num1%10) + (num2%10) + carry;

**if**(temp>=10){

carry = 1;

count++;

}

**else**{

carry = 0;

}

num1 = num1/10;

num2 = num2/10;

}

System.*out*.println(count);

}}

## Statues

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

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

**int** count = 0;

**int** sum = 0;

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

room[i] = in.nextInt();

sum += room[i];

}

sum /= n;

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

**if** (room[i] - sum > 0) {

count += (room[i] - sum);

}

}

System.*out*.println(count);

}

}

## Magical Number

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** temp = num;

String str = Integer.*toString*(num);

**int** flag = 0;

**int** i = 1;

**int** count = 0;

**while** (flag == 0 && temp != 0) {

**if** (temp % 10 == 4) {

num = num + (3 \* i);

flag = 1;

} **else** **if** (temp % 10 == 7) {

num = num - (3 \* i);

i \*= 10;

temp = temp / 10;

}

count++;

}

**if** (count == str.length() && flag == 0) {

num = num + 4 \* i;

}

System.*out*.println(num);

}

}

## Chess Puzzle

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** order[][] = **new** **int**[2][n];

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

order[0][i] = in.nextInt();

order[1][i] = in.nextInt();

}

**boolean** flag = **false**;

**for** (**int** i = 0; i < n - 1 && flag == **false**; i++) {

**for** (**int** k = i + 1; k < n && flag == **false**; k++) {

**if** ((order[0][i] == order[0][k])|| (order[1][i] == order[1][k])) {

flag = **true**;

}

}

}

**if** (flag == **true**) {

System.*out*.println("NOT SAFE");

} **else** {

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

}

}

}

## Cheer Leader Pattern

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

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

**char**[][] matrix = **new** **char**[n][n];

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

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

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

matrix[i][j] = 'M';

}

**else** **if**((i==0 || i == n-1) || j == 0 || j == n-1){

matrix[i][j] = 'F';

}

**else**{

matrix[i][j] = 'C';

}

}

}

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

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

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

}

System.*out*.println();

}

}

}

## Counting Stars

**import** java.util.Scanner;

**public** **class** Main {

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

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

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

**int** m = in.nextInt();

**int** i;

**int** j;

**int**[][] stars = **new** **int**[n][m];

**int** sum =0;

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

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

stars[i][j] = in.nextInt();

}

}

**int** numQuery = in.nextInt();

**int**[][] query = **new** **int**[numQuery][4];

**for**(i=0;i<numQuery;i++){

**for**(j=0;j<4;j++){

query[i][j] = in.nextInt();

}

}

**for**(**int** k=0;k<numQuery;k++){

**for**(i=query[k][0]-1;i<query[k][2];i++){

**for**(j=query[k][1]-1;j<query[k][3];j++){

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

}

}

System.*out*.println(sum);

sum = 0;

}

}

}

## String Encryption

**import** java.util.Scanner;

**public** **class** Main {

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

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

String str = in.next();

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

**char**[] array1 = **new** **char**[50];

**int**[] count = **new** **int**[50];

**int** i = 0;

**int** flag = 0;

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

**if**(array1.length == 0){

array1[i] = charArray[j];

count[i]++;

i++;

}

**else**{

**for**(**int** k = 0;k<array1.length;k++){

**if**(charArray[j] == array1[k]){

count[k]++;

flag = 1;

}

}

**if**(flag == 0){

array1[i] = charArray[j];

count[i]++;

i++;

}

}

flag = 0;

}

String strEn = "";

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

strEn = strEn+array1[k]+count[k];

}

System.*out*.println(strEn);

}

}

## Distorted Message

**import** java.util.Scanner;

**public** **class** Main {

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

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

String str = in.nextLine();

str = str.replaceAll("iiing", "th");

System.*out*.println(str);

}

}

## Yoda

**import** java.util.Scanner;

**public** **class** Main {

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

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

String str = in.nextLine();

String newStr = "";

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

**for**(**int** i=2;i<strArray.length;i++){

newStr = newStr + strArray[i] + " ";

}

newStr = newStr + strArray[0] + " " + strArray[1];

System.*out*.println(newStr);

}

}

# String API

## lastIndexOf()

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

System.*out*.println("Enter the string to be searched");

String strSearch = in.nextLine();

**int** index = str.lastIndexOf(strSearch);

System.*out*.println("The index of last occurence of \""+strSearch+"\" is "+index);

System.*out*.println("Enter the index limit");

**int** limit = in.nextInt();

**int** newIndex = str.lastIndexOf(strSearch, limit);

System.*out*.println("First occurence of \""+strSearch+"\" from "+limit+"th index backwards is "+newIndex);

}

}

## startsWith()

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

System.*out*.println("Enter the start string");

String startStr = in.nextLine();

**boolean** flag = str.startsWith(startStr);

**if**(flag){

System.*out*.println("\""+str+"\""+" starts with \""+startStr+"\"");

}

**else**{

System.*out*.println("\""+str+"\""+" does not start with \""+startStr+"\"");

}

}

}

## endsWith ()

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

System.*out*.println("Enter the end string");

String startStr = in.nextLine();

**boolean** flag = str.endsWith(startStr);

**if**(flag){

System.*out*.println("\""+str+"\""+" ends with \""+startStr+"\"");

}

**else**{

System.*out*.println("\""+str+"\""+" does not end with \""+startStr+"\"");

}

}

}

## Split()

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

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

System.*out*.println("The words in the string are");

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

**if**(str1.equals("")){

}**else**{

System.*out*.println(str1);

}

}

}

}

## Replace()

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the content of the document");

String str = in.nextLine();

System.*out*.println("Enter the old name of the company");

String oldStr = in.nextLine();

System.*out*.println("Enter the new name of the company");

String newStr = in.nextLine();

System.*out*.println("The content of the modified document is");

str = str.replaceAll(oldStr, newStr);

System.*out*.println(str);

}

}

## Removing Multiple Spaces

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

String str2 = "";

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

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

**if**(str1.equals("")){

}**else**{

str2 = str2 + str1 + " ";

}

}

System.*out*.println("The processed string is "+str2);

}

}

## Display String Vertically

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

System.*out*.println("The string printed vertically forwards and backwards is");

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

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

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

System.*out*.println(charArray[i]+" "+charArray[length-i-1]);

}

}

}

## Adjacent Characters

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

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

String strNew = "" + charArray[0];

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

**if** (charArray[i - 1] == charArray[i]) {

strNew += '\*';

strNew += charArray[i];

} **else** {

strNew += charArray[i];

}

}

System.*out*.println("The processed string is " + strNew);

}

}

## Move Lowercase x

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

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

String strNew = "";

**int** count = 0;

**for**(**char** character : charArray){

**if**(character != 'x'){

strNew = strNew + character;

count++;

}

}

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

strNew = strNew + 'x';

}

System.*out*.println("The processed string is "+strNew);

}

}

## Capitalize String

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the string");

String str = in.nextLine();

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

String strNew = "";

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

strArray[i] = strArray[i].toUpperCase().substring(0,1) + strArray[i].substring(1);

strNew = strNew + strArray[i] + " ";

}

System.*out*.println("Capitalized version:");

System.*out*.println(strNew);

}

}

# Object Oriented Programming I

## Getters and Setters

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

Product pro = **new** Product();

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

System.*out*.println("Enter the product id");

pro.setId(in.nextLong());

in.nextLine(); // to avoid skipping the input

System.*out*.println("Enter the product name");

pro.setProductName(in.nextLine());

System.*out*.println("Enter the supplier name");

pro.setSupplierName(in.nextLine());

System.*out*.println("Product Id is "+pro.getId());

System.*out*.println("Product Name is "+pro.getProductName());

System.*out*.println("Supplier Name is "+pro.getSupplierName());

}

}

**Product.java**

**import** java.util.Scanner;

**public** **class** Main {

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

Product pro = **new** Product();

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

System.*out*.println("Enter the product id");

pro.setId(in.nextLong());

in.nextLine(); // to avoid skipping the input

System.*out*.println("Enter the product name");

pro.setProductName(in.nextLine());

System.*out*.println("Enter the supplier name");

pro.setSupplierName(in.nextLine());

System.*out*.println("Product Id is "+pro.getId());

System.*out*.println("Product Name is "+pro.getProductName());

System.*out*.println("Supplier Name is "+pro.getSupplierName());

}

}

## Constructors

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the product id");

**long** id = in.nextLong();

in.nextLine(); // to avoid skipping the input

System.*out*.println("Enter the product name");

String productName = in.nextLine();

System.*out*.println("Enter the supplier name");

String supplierName = in.nextLine();

Product pro = **new** Product(id,productName,supplierName);

pro.display();

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**public** Product(){

}

**public** Product(**long** id,String productName, String supplierName){

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

}

**public** **void** display(){

System.*out*.println("Product Id is "+id);

System.*out*.println("Product Name is "+productName);

System.*out*.println("Supplier Name is "+supplierName);

}

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

}

## Constructor Overloading

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the product id");

**long** id = in.nextLong();

in.nextLine(); // to avoid skipping the input

System.*out*.println("Enter the product name");

String productName = in.nextLine();

System.*out*.println("Is the product supplied by Nivas Suppliers? Type yes or no (not case sensitive)");

String ans = in.nextLine();

**if**(ans.equalsIgnoreCase("no")){

System.*out*.println("Enter the supplier name");

String supplierName = in.nextLine();

Product pro = **new** Product(id,productName,supplierName);

pro.display();

}

**else**{

Product pro = **new** Product(id,productName);

pro.display();

}

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**public** Product(){

}

**public** Product(**long** id,String productName, String supplierName){

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

}

**public** Product(**long** id,String productName){

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = "Nivas";

}

**public** **void** display(){

System.*out*.println("Product Id is "+id);

System.*out*.println("Product Name is "+productName);

System.*out*.println("Supplier Name is "+supplierName);

}

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

}

## toString() and getClass()

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the product id");

**long** id = in.nextLong();

in.nextLine(); // to avoid skipping the input

System.*out*.println("Enter the product name");

String productName = in.nextLine();

System.*out*.println("Enter the supplier name");

String supplierName = in.nextLine();

Product pro = **new** Product(id,productName,supplierName);

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

System.*out*.println("Invoking getClass() method : "+pro.getClass());

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**public** Product(){

}

**public** Product(**long** id,String productName, String supplierName){

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

}

**public** String toString(){

**return** id+" : "+productName+" : "+supplierName;

}

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

}

## equals()

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the product id");

**long** id = in.nextLong();

in.nextLine(); // to avoid skipping the input

System.*out*.println("Enter the product name");

String productName = in.nextLine();

System.*out*.println("Enter the supplier name");

String supplierName = in.nextLine();

Product pro = **new** Product(id,productName,supplierName);

pro.display();

System.*out*.println("Enter the product id");

id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

productName = in.nextLine();

System.*out*.println("Enter the supplier name");

supplierName = in.nextLine();

Product pro1 = **new** Product(id,productName,supplierName);

pro1.display();

**if**(pro1.equals(pro)){

System.*out*.println("The two products are the same");

}

**else**{

System.*out*.println("The two products are different");

}

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**public** Product(){

}

**public** Product(**long** id,String productName, String supplierName){

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

}

**public** **boolean** equals(Product product){

**boolean** flag;

**if**(**this**.id == product.id && **this**.supplierName.equals(product.supplierName) && **this**.productName.equals(product.productName)){

flag = **true**;

}

**else**{

flag = **false**;

}

**return** flag;

}

**public** **void** display(){

System.*out*.println("Product Id is "+id);

System.*out*.println("Product Name is "+productName);

System.*out*.println("Supplier Name is "+supplierName);

}

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

}

## Static Members

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

StaticIllustration si1 = **new** StaticIllustration();

StaticIllustration si2 = **new** StaticIllustration();

System.*out*.println("Enter Object 1 details");

System.*out*.println("Enter i1");

si1.setI1(in.nextInt());

System.*out*.println("Enter i2");

StaticIllustration.*setI2*(in.nextInt());

System.*out*.println("Object 1 Details : "+si1.toString());

System.*out*.println("Enter Object 2 details");

System.*out*.println("Enter i1");

si2.setI1(in.nextInt());

System.*out*.println("Enter i2");

StaticIllustration.*setI2*(in.nextInt());

System.*out*.println("Object 2 Details : "+si2.toString());

System.*out*.println("Object 1 Details : "+si1.toString());

}

}

**StaticIllustration.java**

**public** **class** StaticIllustration {

**private** **int** i1;

**private** **static** **int** *i2*;

**public** String toString(){

**return** "i1 = "+i1+",i2 = "+*i2*;

}

**public** **int** getI1() {

**return** i1;

}

**public** **void** setI1(**int** i1) {

**this**.i1 = i1;

}

**public** **static** **int** getI2() {

**return** *i2*;

}

**public** **static** **void** setI2(**int** i2) {

StaticIllustration.*i2* = i2;

}

}

## No. of Objects created

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

String ans;

**boolean** flag = **true**;

Dummy dum;

**while**(flag){

dum = **new** Dummy();

System.*out*.println("Enter Object "+ Dummy.*getCount*() + " \"a\" value");

dum.setA(in.nextInt());

System.*out*.println("Object "+Dummy.*getCount*()+" details");

dum.display();

System.*out*.println("Do you want to create another object? Type yes or no (not case sensitive)");

ans = in.next();

**if**(ans.equalsIgnoreCase("no")){

flag = **false**;

}

}

System.*out*.println("The number of objects created so far is "+Dummy.*getCount*());

}

}

**Dummy.java**

**public** **class** Dummy {

**private** **int** a;

**private** **static** **int** *count*;

**public** Dummy(){

*count*++;

}

**public** Dummy(**int** a) {

**this**.a = a;

*count*++;

}

**public** **int** getA() {

**return** a;

}

**public** **void** setA(**int** a) {

**this**.a = a;

}

**public** **static** **int** getCount() {

**return** *count*;

}

**public** **static** **void** setCount(**int** count) {

Dummy.*count* = count;

}

**public** **void** display(){

System.*out*.println("The value of a is "+a);

System.*out*.println("The number of objects created is "+*count*);

}

}

## Math Class

**import** java.util.Scanner;

**public** **class** Main {

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

Integer num1;

Integer num2;

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

System.*out*.println("Enter the first integer");

num1 = in.nextInt();

System.*out*.println("Enter the second integer");

num2 = in.nextInt();

System.*out*.println("Absolute value of "+num1+" is "+Math.*abs*(num1));

System.*out*.println("Absolute value of "+num2+" is "+Math.*abs*(num2));

**if**(num1.equals(num2)){

System.*out*.println(num1+" = "+num2);

}

**else**{

System.*out*.println(num1+" != "+num2);

}

}

}

## Wrapper Class – Integer I

**import** java.util.Scanner;

**public** **class** Main {

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

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

Integer num1;

System.*out*.println("Enter an integer");

num1 = in.nextInt();

System.*out*.println("The binary equivalent of "+num1+" is "+Integer.*toBinaryString*(num1));

System.*out*.println("The hexadecimal equivalent of "+num1+" is "+Integer.*toHexString*(num1));

System.*out*.println("The octal equivalent of "+num1+" is "+Integer.*toOctalString*(num1));

System.*out*.println("Byte value of "+num1+" is "+num1.byteValue());

System.*out*.println("Short value of "+num1+" is "+num1.shortValue());

System.*out*.println("Long value of "+num1+" is "+num1.longValue());

System.*out*.println("Float value of "+num1+" is "+num1.floatValue());

System.*out*.println("Double value of "+num1+" is "+num1.doubleValue());

}

}

## Wrapper Class – Integer II

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the binary number");

String binary = in.next();

System.*out*.println("Enter the octal number");

String octal = in.next();

System.*out*.println("Enter the hexadecimal number");

String hex = in.next();

System.*out*.println("The integer value of the binary number "+binary+" is "+Integer.*parseInt*(binary, 2));

System.*out*.println("The integer value of the octal number "+octal+" is "+Integer.*parseInt*(octal, 8));

System.*out*.println("The integer value of the hexadecimal number "+hex+" is "+Integer.*parseInt*(hex, 16));

}

}

## Command Line Arguments I

**public** **class** Main {

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

System.*out*.println("The number of arguments passed is "+args.length);

**if**(args.length != 0){

System.*out*.println("The command line arguments passed are");

**for**(String str : args){

System.*out*.println(str);

}

}

}

}

## Command Line Arguments II

**public** **class** Main {

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

**int** i = 0;

**int**[] num = **new** **int**[args.length];

**if**(args.length == 2){

**for**(String str : args){

num[i] = Integer.*parseInt*(str);

i++;

}

**int** sum = num[0]+num[1];

System.*out*.println("The sum of "+num[0]+" and "+num[1]+" is "+ sum);

}

**else**{

System.*out*.println("Invalid Input");

}

}

}

# Object Oriented Programming II

## Product 1

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the product id");

**long** id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

String productName = in.nextLine();

System.*out*.println("Enter the supplier name");

String supplierName = in.nextLine();

System.*out*.println("Enter the product price");

**int** price = in.nextInt();

Product product = **new** Product(id,productName,supplierName,price);

ProductBO proBO = **new** ProductBO();

proBO.displayProductDetails(product);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**public** **class** ProductBO {

**public** **void** displayProductDetails(Product product){

System.*out*.println("Product Id is "+product.getId());

System.*out*.println("Product Name is "+product.getProductName());

System.*out*.println("Supplier Name is "+product.getSupplierName());

System.*out*.println("Product price is "+product.getPrice());

}

}

## Product 2

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the product id");

**long** id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

String productName = in.nextLine();

System.*out*.println("Enter the supplier name");

String supplierName = in.nextLine();

System.*out*.println("Enter the product price");

**int** price = in.nextInt();

Product product = **new** Product(id,productName,supplierName,price);

ProductBO proBO = **new** ProductBO();

proBO.displayProductDetails(product);

System.*out*.println("Update Menu :");

System.*out*.println("1) Update product name");

System.*out*.println("2) Update supplier name");

System.*out*.println("3) Update product price");

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

**int** choice = in.nextInt();

in.nextLine();

**switch**(choice){

**case** 1:

System.*out*.println("Enter new product name");

String pname = in.nextLine();

proBO.updateProductName(product, pname);

**break**;

**case** 2:

System.*out*.println("Enter new supplier name");

String sname = in.nextLine();

proBO.updateSupplierName(product, sname);

**break**;

**case** 3:

System.*out*.println("Enter new product price");

Integer p = in.nextInt();

proBO.updateProductPrice(product, p);

**break**;

}

proBO.displayProductDetails(product);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**public** **class** ProductBO {

**public** **void** displayProductDetails(Product product){

System.*out*.println("Product Id is "+product.getId());

System.*out*.println("Product Name is "+product.getProductName());

System.*out*.println("Supplier Name is "+product.getSupplierName());

System.*out*.println("Product price is "+product.getPrice());

}

**public** **void** updateProductName(Product product, String pname){

product.setProductName(pname);

}

**public** **void** updateSupplierName(Product product, String sname){

product.setSupplierName(sname);

}

**public** **void** updateProductPrice(Product product, Integer p){

product.setPrice(p);

}

}

## Product 3

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

**long** id;

String productName;

String supplierName;

**int** price;

String choice;

**int** count = 0;

Product productList[] = **new** Product[10];

**do**{

System.*out*.println("Enter the product id");

id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

productName = in.nextLine();

System.*out*.println("Enter the supplier name");

supplierName = in.nextLine();

System.*out*.println("Enter the product price");

price = in.nextInt();

productList[count] = **new** Product(id,productName,supplierName,price);

count++;

System.*out*.println("Do you want to enter the details of another product? Enter yes or no (not case sensitive)");

choice = in.next();

}**while**(choice.equalsIgnoreCase("YES"));

ProductBO proBO = **new** ProductBO();

proBO.displayAllProductDetails(productList, count);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**public** **class** ProductBO {

**public** **void** displayAllProductDetails(Product productList[], **int** count) {

System.*out*.format("%-10s %-20s %-20s %-10s\n", "Id","ProductName","SupplierName","Price");

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

System.*out*.format("%-10s %-20s %-20s %-10s\n",

productList[i].getId(),

productList[i].getProductName(),

productList[i].getSupplierName(),

productList[i].getPrice());

}

}

}

## Product 4

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

**long** id;

String productName;

String supplierName;

**int** price;

String choice;

List<Product> productList = **new** ArrayList<Product>();

**do**{

System.*out*.println("Enter the product id");

id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

productName = in.nextLine();

System.*out*.println("Enter the supplier name");

supplierName = in.nextLine();

System.*out*.println("Enter the product price");

price = in.nextInt();

productList.add(**new** Product(id,productName,supplierName,price));

System.*out*.println("Do you want to enter the details of another product? Enter yes or no (not case sensitive)");

choice = in.next();

}**while**(choice.equalsIgnoreCase("YES"));

ProductBO proBO = **new** ProductBO();

proBO.displayAllProductDetails(productList);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**import** java.util.Iterator;

**import** java.util.List;

**public** **class** ProductBO {

**public** **void** displayAllProductDetails(List<Product> productList) {

Iterator<Product> iterator = productList.iterator();

System.*out*.format("%-10s %-20s %-20s %-10s\n", "Id","ProductName","SupplierName","Price");

**while**(iterator.hasNext()){

Product pro = iterator.next();

System.*out*.format("%-10s %-20s %-20s %-10s\n",

pro.getId(),

pro.getProductName(),

pro.getSupplierName(),

pro.getPrice());

}

}

}

## Product 5

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

**long** id;

String productName;

String supplierName;

**int** price;

String choice;

String pname;

List<Product> productList = **new** ArrayList<Product>();

**do**{

System.*out*.println("Enter the product id");

id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

productName = in.nextLine();

System.*out*.println("Enter the supplier name");

supplierName = in.nextLine();

System.*out*.println("Enter the product price");

price = in.nextInt();

productList.add(**new** Product(id,productName,supplierName,price));

System.*out*.println("Do you want to enter the details of another product? Enter yes or no (not case sensitive)");

choice = in.next();

}**while**(choice.equalsIgnoreCase("YES"));

in.nextLine();

System.*out*.println("Enter the name of the product to be searched");

pname = in.nextLine();

ProductBO proBO = **new** ProductBO();

proBO.searchProductByName (productList,pname);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**import** java.util.Iterator;

**import** java.util.List;

**public** **class** ProductBO {

**public** **void** searchProductByName (List<Product> productList, String pname){

Iterator<Product> iterator = productList.iterator();

**boolean** flag = **true**;

Product pro = **new** Product();

**while**(iterator.hasNext() && flag){

pro = iterator.next();

**if**(pname.equalsIgnoreCase(pro.getProductName())){

flag = **false**;

}

}

**if**(!flag){

System.*out*.format("%-10s %-20s %-20s %-10s\n", "Id","ProductName","SupplierName","Price");

System.*out*.format("%-10s %-20s %-20s %-10s\n",

pro.getId(),

pro.getProductName(),

pro.getSupplierName(),

pro.getPrice());

}

**else**{

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

}

}

}

## Product 6

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

**long** id;

String productName;

String supplierName;

**int** price;

String choice;

String pname;

String sname;

List<Product> productList = **new** ArrayList<Product>();

**do**{

System.*out*.println("Enter the product id");

id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

productName = in.nextLine();

System.*out*.println("Enter the supplier name");

supplierName = in.nextLine();

System.*out*.println("Enter the product price");

price = in.nextInt();

productList.add(**new** Product(id,productName,supplierName,price));

System.*out*.println("Do you want to enter the details of another product? Enter yes or no (not case sensitive)");

choice = in.next();

}**while**(choice.equalsIgnoreCase("YES"));

in.nextLine();

System.*out*.println("Enter the name of the product to be searched");

pname = in.nextLine();

System.*out*.println("Enter the name of the supplier to be searched");

sname = in.nextLine();

ProductBO proBO = **new** ProductBO();

proBO.searchProductByNameAndSupplier(productList,pname,sname);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**import** java.util.Iterator;

**import** java.util.List;

**public** **class** ProductBO {

**public** **void** searchProductByNameAndSupplier(List<Product> productList, String pname, String sname){

Iterator<Product> iterator = productList.iterator();

**boolean** flag = **true**;

Product pro = **new** Product();

**while**(iterator.hasNext() && flag){

pro = iterator.next();

**if**(pname.equalsIgnoreCase(pro.getProductName()) && sname.equalsIgnoreCase(pro.getSupplierName())){

flag = **false**;

}

}

**if**(!flag){

System.*out*.format("%-10s %-20s %-20s %-10s\n", "Id","ProductName","SupplierName","Price");

System.*out*.format("%-10s %-20s %-20s %-10s\n",

pro.getId(),

pro.getProductName(),

pro.getSupplierName(),

pro.getPrice());

}

**else**{

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

}

}

}

## Product 7

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

**long** id;

String productName;

String supplierName;

**int** price;

String choice;

List<Product> productList = **new** ArrayList<Product>();

**do**{

System.*out*.println("Enter the product id");

id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

productName = in.nextLine();

System.*out*.println("Enter the supplier name");

supplierName = in.nextLine();

System.*out*.println("Enter the product price");

price = in.nextInt();

productList.add(**new** Product(id,productName,supplierName,price));

System.*out*.println("Do you want to enter the details of another product? Enter yes or no (not case sensitive)");

choice = in.next();

}**while**(choice.equalsIgnoreCase("YES"));

System.*out*.println("Enter the minimum price range");

**int** pl = in.nextInt();

System.*out*.println("Enter the maximum price range");

**int** ph = in.nextInt();

ProductBO proBO = **new** ProductBO();

proBO.searchProductByPriceRange(productList,pl,ph);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**import** java.util.Iterator;

**import** java.util.List;

**public** **class** ProductBO {

**public** **void** searchProductByPriceRange (List<Product> productList, **int** pl, **int** ph){

Iterator<Product> iterator = productList.iterator();

**boolean** flag = **true**;

Product pro = **new** Product();

**while**(iterator.hasNext()){

pro = iterator.next();

**if**(pro.getPrice()>=pl && pro.getPrice()<=ph){

**if**(flag){

System.*out*.format("%-10s %-20s %-20s %-10s\n", "Id","ProductName","SupplierName","Price");

flag = **false**;

}

System.*out*.format("%-10s %-20s %-20s %-10s\n",

pro.getId(),

pro.getProductName(),

pro.getSupplierName(),

pro.getPrice());

}

}

**if**(flag){

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

}

}

}

## Product 8

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

**long** id;

String productName;

String supplierName;

**int** price;

String choice;

List<Product> productList = **new** ArrayList<Product>();

**do**{

System.*out*.println("Enter the product id");

id = in.nextLong();

in.nextLine();

System.*out*.println("Enter the product name");

productName = in.nextLine();

System.*out*.println("Enter the supplier name");

supplierName = in.nextLine();

System.*out*.println("Enter the product price");

price = in.nextInt();

productList.add(**new** Product(id,productName,supplierName,price));

System.*out*.println("Do you want to enter the details of another product? Enter yes or no (not case sensitive)");

choice = in.next();

}**while**(choice.equalsIgnoreCase("YES"));

in.nextLine();

ProductBO proBO = **new** ProductBO();

proBO.displayAllProductDetails(productList);

System.*out*.println("Enter the name of the product to be deleted");

String pname = in.nextLine();

proBO.deleteProduct(productList, pname);

proBO.displayAllProductDetails(productList);

}

}

**Product.java**

**public** **class** Product {

**private** **long** id;

**private** String productName;

**private** String supplierName;

**private** **int** price;

**public** **long** getId() {

**return** id;

}

**public** **void** setId(**long** id) {

**this**.id = id;

}

**public** String getProductName() {

**return** productName;

}

**public** **void** setProductName(String productName) {

**this**.productName = productName;

}

**public** String getSupplierName() {

**return** supplierName;

}

**public** **void** setSupplierName(String supplierName) {

**this**.supplierName = supplierName;

}

**public** **int** getPrice() {

**return** price;

}

**public** **void** setPrice(**int** price) {

**this**.price = price;

}

**public** Product(){

}

**public** Product(**long** id, String productName, String supplierName, **int** price) {

**this**.id = id;

**this**.productName = productName;

**this**.supplierName = supplierName;

**this**.price = price;

}

}

**ProductBO.java**

**import** java.util.ArrayList;

**import** java.util.Iterator;

**import** java.util.List;

**public** **class** ProductBO {

**public** **void** displayAllProductDetails (List<Product> productList){

Product pro;

Iterator<Product> iterator = productList.iterator();

System.*out*.format("%-10s %-20s %-20s %-10s\n", "Id","ProductName","SupplierName","Price");

**while**(iterator.hasNext()){

pro = iterator.next();

System.*out*.format("%-10s %-20s %-20s %-10s\n", pro.getId(),pro.getProductName(),pro.getSupplierName(),pro.getPrice());

}

}

**public** **void** deleteProduct (List<Product> productList, String pname){

Iterator<Product> iterator = productList.iterator();

List<Product> remList = **new** ArrayList<Product>();

Product pro;

**while**(iterator.hasNext()){

pro = iterator.next();

**if**(pro.getProductName().equalsIgnoreCase(pname)){

remList.add(pro);

}

}

productList.removeAll(remList);

}

}

# Object Oriented Programming III

## Address Entity

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

List<Address> address = **new** ArrayList<Address>();

**int** doorNumber;

String street;

String city;

String district;

String state;

**int** pinCode;

System.*out*.println("Enter the number of addresses to be inserted");

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

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

System.*out*.println("Enter address "+i+" details");

System.*out*.println("Enter door number");

doorNumber = in.nextInt();

in.nextLine();

System.*out*.println("Enter street name");

street = in.nextLine();

System.*out*.println("Enter city name");

city = in.nextLine();

System.*out*.println("Enter district name");

district = in.nextLine();

System.*out*.println("Enter state name");

state = in.nextLine();

System.*out*.println("Enter pin code");

pinCode = in.nextInt();

in.nextLine();

address.add(**new** Address(doorNumber,street,city,district,state,pinCode));

}

System.*out*.println("Enter a state name");

state = in.nextLine();

//System.out.println("My d "+state);

Address.*districtInState*(address, state);

System.*out*.println("Enter a district name");

district = in.nextLine();

//System.out.println("My d "+district);

Address.*cityInDistrict*(address, district);

}

}

**Address.java**

**import** java.util.Iterator;

**import** java.util.List;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** Address {

**private** **int** doorNumber;

**private** String street;

**private** String city;

**private** String district;

**private** String state;

**private** **int** pinCode;

**public** **int** getDoorNumber() {

**return** doorNumber;

}

**public** **void** setDoorNumber(**int** doorNumber) {

**this**.doorNumber = doorNumber;

}

**public** String getStreet() {

**return** street;

}

**public** **void** setStreet(String street) {

**this**.street = street;

}

**public** String getCity() {

**return** city;

}

**public** **void** setCity(String city) {

**this**.city = city;

}

**public** String getDistrict() {

**return** district;

}

**public** **void** setDistrict(String district) {

**this**.district = district;

}

**public** String getState() {

**return** state;

}

**public** **void** setState(String state) {

**this**.state = state;

}

**public** **int** getPinCode() {

**return** pinCode;

}

**public** **void** setPinCode(**int** pinCode) {

**this**.pinCode = pinCode;

}

**public** Address(**int** doorNumber, String street, String city, String district,

String state, **int** pinCode) {

**super**();

**this**.doorNumber = doorNumber;

**this**.street = street;

**this**.city = city;

**this**.district = district;

**this**.state = state;

**this**.pinCode = pinCode;

}

**public** **static** **void** districtInState(List<Address> address, String state){

Iterator<Address> iterator = address.iterator();

Address addr;

**boolean** flag = **true**;

Set<String> districts = **new** TreeSet<String>();

**while**(iterator.hasNext()){

addr = iterator.next();

**if**(addr.getState().equalsIgnoreCase(state)){

**if**(flag){

System.*out*.println("List of districts in "+state+" are");

flag = **false**;

}

districts.add(addr.getDistrict());

}

}

**if**(!flag){

Iterator<String> it = districts.iterator();

**while**(it.hasNext()){

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

}

}

**else**{

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

}

}

**public** **static** **void** cityInDistrict(List<Address> address, String district){

Iterator<Address> iterator = address.iterator();

Address addr;

**boolean** flag = **true**;

Set<String> cities = **new** TreeSet<String>();

**while**(iterator.hasNext()){

addr = iterator.next();

**if**(addr.getDistrict().equalsIgnoreCase(district)){

**if**(flag){

System.*out*.println("List of cities in "+district+" are");

flag = **false**;

}

cities.add(addr.getCity());

}

}

**if**(!flag){

Iterator<String> it = cities.iterator();

**while**(it.hasNext()){

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

}

}

**else**{

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

}

}

}

## User Entity

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

List<User> user = **new** ArrayList<User>();

String name;

String mobileNumber;

String email;

Address address = **new** Address();

String creditCardNumber;

**int** choice;

User userObj = **new** User();

System.*out*.println("Enter the number of user details to be inserted");

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

in.nextLine();

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

System.*out*.println("Enter details of user "+i);

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

name = in.nextLine();

System.*out*.println("Enter mobile number");

mobileNumber = in.nextLine();

System.*out*.println("Enter email address");

email = in.nextLine();

System.*out*.println("Enter address details");

System.*out*.println("Enter door number");

address.setDoorNumber(in.nextInt());

in.nextLine();

System.*out*.println("Enter street name");

address.setStreet(in.nextLine());

System.*out*.println("Enter city name");

address.setCity(in.nextLine());

System.*out*.println("Enter district name");

address.setDistrict(in.nextLine());

System.*out*.println("Enter state name");

address.setState(in.nextLine());

System.*out*.println("Enter pin code");

address.setPinCode(in.nextInt());

in.nextLine();

System.*out*.println("Enter credit card number");

creditCardNumber = in.nextLine();

user.add(**new** User(name, mobileNumber, email, address, creditCardNumber));

}

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

System.*out*.println("1) Search for user details using mobile number.");

System.*out*.println("2) Search for user details using mobile number and then change the email id of the above user to new id provided.");

System.*out*.println("3) List the names of users in which the given string is a substring.");

System.*out*.println("4) List the names of users from a particular district.");

System.*out*.println("Any other choice : Exit");

**boolean** flag = **true**;

**while**(flag){

System.*out*.println("Enter your choice");

choice = in.nextInt();

in.nextLine();

**switch**(choice){

**case** 1:

System.*out*.println("Enter the mobile number");

mobileNumber = in.nextLine();

userObj.mobileSearch(user, mobileNumber);

**break**;

**case** 2:

System.*out*.println("Enter the mobile number");

mobileNumber = in.nextLine();

System.*out*.println("Enter the new email id");

email = in.nextLine();

userObj.mobileSearchEmail(user, mobileNumber, email);

**break**;

**case** 3:

System.*out*.println("Enter the substring");

String sub = in.nextLine();

userObj.nameSearch(user, sub);

**break**;

**case** 4:

System.*out*.println("Enter the district name");

String district = in.nextLine();

userObj.districtSearch(user, district);

**break**;

**default**:

System.*out*.println("Application Terminated");

flag = **false**;

}

}

}

}

**Address.java**

**import** java.util.Iterator;

**import** java.util.List;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** Address {

**private** **int** doorNumber;

**private** String street;

**private** String city;

**private** String district;

**private** String state;

**private** **int** pinCode;

**public** **int** getDoorNumber() {

**return** doorNumber;

}

**public** **void** setDoorNumber(**int** doorNumber) {

**this**.doorNumber = doorNumber;

}

**public** String getStreet() {

**return** street;

}

**public** **void** setStreet(String street) {

**this**.street = street;

}

**public** String getCity() {

**return** city;

}

**public** **void** setCity(String city) {

**this**.city = city;

}

**public** String getDistrict() {

**return** district;

}

**public** **void** setDistrict(String district) {

**this**.district = district;

}

**public** String getState() {

**return** state;

}

**public** **void** setState(String state) {

**this**.state = state;

}

**public** **int** getPinCode() {

**return** pinCode;

}

**public** **void** setPinCode(**int** pinCode) {

**this**.pinCode = pinCode;

}

**public** Address(){

}

**public** Address(**int** doorNumber, String street, String city, String district,

String state, **int** pinCode) {

**this**.doorNumber = doorNumber;

**this**.street = street;

**this**.city = city;

**this**.district = district;

**this**.state = state;

**this**.pinCode = pinCode;

}

**public** **void** districtInState(List<Address> address, String state){

Iterator<Address> iterator = address.iterator();

Address addr;

**boolean** flag = **true**;

Set<String> districts = **new** TreeSet<String>();

**while**(iterator.hasNext()){

addr = iterator.next();

**if**(addr.getState().equalsIgnoreCase(state)){

**if**(flag){

System.*out*.println("List of districts in "+state+" are");

flag = **false**;

}

districts.add(addr.getDistrict());

}

}

**if**(!flag){

Iterator<String> it = districts.iterator();

**while**(it.hasNext()){

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

}

}

**else**{

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

}

}

**public** **void** cityInDistrict(List<Address> address, String district){

Iterator<Address> iterator = address.iterator();

Address addr;

**boolean** flag = **true**;

Set<String> cities = **new** TreeSet<String>();

**while**(iterator.hasNext()){

addr = iterator.next();

**if**(addr.getDistrict().equalsIgnoreCase(district)){

**if**(flag){

System.*out*.println("List of cities in "+district+" are");

flag = **false**;

}

cities.add(addr.getCity());

}

}

**if**(!flag){

Iterator<String> it = cities.iterator();

**while**(it.hasNext()){

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

}

}

**else**{

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

}

}

}

**User.java**

**import** java.util.Iterator;

**import** java.util.List;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** User {

**private** String name;

**private** String mobileNumber;

**private** String email;

**private** Address address;

**private** String creditCardNumber;

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** String getMobileNumber() {

**return** mobileNumber;

}

**public** **void** setMobileNumber(String mobileNumber) {

**this**.mobileNumber = mobileNumber;

}

**public** String getEmail() {

**return** email;

}

**public** **void** setEmail(String email) {

**this**.email = email;

}

**public** Address getAddress() {

**return** address;

}

**public** **void** setAddress(Address address) {

**this**.address = address;

}

**public** String getCreditCardNumber() {

**return** creditCardNumber;

}

**public** **void** setCreditCardNumber(String creditCardNumber) {

**this**.creditCardNumber = creditCardNumber;

}

**public** User(){

}

**public** User(String name, String mobileNumber, String email,

Address address, String creditCardNumber) {

**this**.name = name;

**this**.mobileNumber = mobileNumber;

**this**.email = email;

**this**.address = address;

**this**.creditCardNumber = creditCardNumber;

}

**public** **void** mobileSearch(List<User> user, String mobileNumber){

Iterator<User> it = user.iterator();

User userObj;

**boolean** flag = **false**;

**while**(it.hasNext()){

userObj = it.next();

**if**(userObj.getMobileNumber().equalsIgnoreCase(mobileNumber)){

System.*out*.println("User Details:");

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

System.*out*.println("Email : "+userObj.getEmail());

System.*out*.println("Credit Card Number : "+userObj.getCreditCardNumber());

flag = **true**;

}

}

**if**(!flag){

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

}

}

**public** **void** mobileSearchEmail(List<User> user, String mobileNumber, String email){

Iterator<User> it = user.iterator();

User userObj;

**boolean** flag = **false**;

**while**(it.hasNext()){

userObj = it.next();

**if**(userObj.getMobileNumber().equalsIgnoreCase(mobileNumber)){

userObj.setEmail(email);

flag = **true**;

}

}

**if**(!flag){

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

}

}

**public** **void** nameSearch(List<User> user, String sub){

Iterator<User> it = user.iterator();

User userObj;

**boolean** flag = **true**;

Set<String> names = **new** TreeSet<String>();

**while**(it.hasNext()){

userObj = it.next();

**if**(userObj.getName().toLowerCase().contains(sub.toLowerCase())){

**if**(flag){

System.*out*.println("List of user names that contain the substring "+sub);

flag = **false**;

}

names.add(userObj.getName());

}

}

**if**(!flag){

Iterator<String> it1 = names.iterator();

**while**(it1.hasNext()){

System.*out*.println(it1.next());

}

}

**else**{

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

}

}

**public** **void** districtSearch(List<User> user, String district){

Iterator<User> it = user.iterator();

User userObj;

**boolean** flag = **true**;

Set<String> names = **new** TreeSet<String>();

**while**(it.hasNext()){

userObj = it.next();

**if**(userObj.getAddress().getDistrict().equalsIgnoreCase(district)){

**if**(flag){

System.*out*.println("List of users from "+district);

flag = **false**;

}

names.add(userObj.getName());

}

}

**if**(!flag){

Iterator<String> it1 = names.iterator();

**while**(it1.hasNext()){

System.*out*.println(it1.next());

}

}

**else**{

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

}

}

}

## User

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

String ans;

String name;

String email;

String gender;

Author author = **new** Author();

List<Author> authorList = **new** ArrayList<Author>();

**do**{

System.*out*.println("Enter the author name");

name = in.nextLine();

System.*out*.println("Enter the author email id");

email = in.nextLine();

System.*out*.println("Enter the author's gender");

gender = in.nextLine();

authorList.add(**new** Author(name,email,gender));

System.*out*.println("Do you want to add the details of another author? Type Yes/No (Not case sensitive)");

ans = in.nextLine();

}**while**(ans.equalsIgnoreCase("yes"));

AuthorBO abo = **new** AuthorBO();

abo.displayAllAuthorDetails(authorList);

System.*out*.println("Enter the name of the author to be searched");

name = in.nextLine();

author = abo.findAuthorByName(authorList, name);

**if**(author == **null**){

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

}

**else**{

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

}

abo.listAuthorNamesInSortedOrder(authorList);

}

}

**Author.java**

**public** **class** Author **implements** Comparable<Author>{

**private** String name;

**private** String email;

**private** String gender;

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** String getEmail() {

**return** email;

}

**public** **void** setEmail(String email) {

**this**.email = email;

}

**public** String getGender() {

**return** gender;

}

**public** **void** setGender(String gender) {

**this**.gender = gender;

}

**public** Author(){

}

**public** Author(String name, String email, String gender) {

**this**.name = name;

**this**.email = email;

**this**.gender = gender;

}

**public** **int** compareTo(Author auth) {

//Author auth1 = (Author)auth;

**int** diff;

diff = **this**.name.compareTo(auth.name);

**return** diff;

}

**public** String toString(){

String str = name +" ("+gender+") contact at "+email;

**return** str;

}

}

**AuthorBO.java**

**import** java.util.Iterator;

**import** java.util.List;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** AuthorBO {

**public** **void** displayAllAuthorDetails (List<Author> authorList){

Author auth;

System.*out*.format("%-20s %-20s %-20s\n", "Name","Email","Gender");

Iterator<Author> it = authorList.iterator();

**while**(it.hasNext()){

auth = it.next();

System.*out*.format("%-20s %-20s %-20s\n", auth.getName(),auth.getEmail(),auth.getGender());

}

}

**public** **void** listAuthorNamesInSortedOrder (List<Author> authorList){

Set<String> authorSortedList = **new** TreeSet<String>();

Author auth;

Iterator<Author> it = authorList.iterator();

**while**(it.hasNext()){

auth = it.next();

authorSortedList.add(auth.getName());

}

Iterator<String> it1 = authorSortedList.iterator();

System.*out*.println("Alphabetically sorted author names");

**while**(it1.hasNext()){

System.*out*.println(it1.next());

}

}

**public** Author findAuthorByName(List<Author> authorList, String name){

Author author = **new** Author();

Iterator<Author> it = authorList.iterator();

**boolean** flag = **true**;

**while**(it.hasNext()&& flag){

author = it.next();

**if**(name.equalsIgnoreCase(author.getName())){

flag = **false**;

}

}

**if**(flag){

author = **null**;

}

**return** author;

}

}

## Book

**Main.java**

**import** java.util.ArrayList;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

String name;

List<Author> authorList = **new** ArrayList<Author>();

**double** price;

**int** qtyInStock = 0;

**int** numAuthors;

String ans;

String authName;

String email;

String gender;

Book book;

System.*out*.println("Enter the book name");

name = in.nextLine();

System.*out*.println("Enter the number of authors");

numAuthors = in.nextInt();

in.nextLine();

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

System.*out*.println("Enter the author name");

authName = in.nextLine();

System.*out*.println("Enter the author email id");

email = in.nextLine();

System.*out*.println("Enter the author's gender");

gender = in.nextLine();

authorList.add(**new** Author(authName, email, gender));

}

System.*out*.println("Enter the book price");

price = in.nextDouble();

System.*out*.println("Is the book currently available? Type Yes/No (Not case sensitive)");

ans = in.next();

**if**(ans.equalsIgnoreCase("yes")){

System.*out*.println("Enter the number of books available");

qtyInStock = in.nextInt();

book = **new** Book(name, authorList, price, qtyInStock);

}

**else**{

book = **new** Book(name, authorList, price);

}

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

}

}

**Author.java**

**public** **class** Author **implements** Comparable<Author>{

**private** String name;

**private** String email;

**private** String gender;

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** String getEmail() {

**return** email;

}

**public** **void** setEmail(String email) {

**this**.email = email;

}

**public** String getGender() {

**return** gender;

}

**public** **void** setGender(String gender) {

**this**.gender = gender;

}

**public** Author(){

}

**public** Author(String name, String email, String gender) {

**this**.name = name;

**this**.email = email;

**this**.gender = gender;

}

**public** **int** compareTo(Author auth) {

//Author auth1 = (Author)auth;

**int** diff;

diff = **this**.name.compareTo(auth.name);

**return** diff;

}

**public** String toString(){

String str = name +" ("+gender+") contact at "+email;

**return** str;

}

}

**Book.java**

**import** java.util.Iterator;

**import** java.util.List;

**public** **class** Book {

**private** String name;

**private** List<Author> authorList;

**private** **double** price;

**private** **int** qtyInStock = 0;

**public** String getName() {

**return** name;

}

**public** List<Author> getAuthorList() {

**return** authorList;

}

**public** **double** getPrice() {

**return** price;

}

**public** **int** getQtyInStock() {

**return** qtyInStock;

}

**public** Book(String name, List<Author> authorList, **double** price,

**int** qtyInStock) {

**this**.name = name;

**this**.authorList = authorList;

**this**.price = price;

**this**.qtyInStock = qtyInStock;

}

**public** Book(String name, List<Author> authorList, **double** price) {

**this**.qtyInStock = 0;

**this**.name = name;

**this**.authorList = authorList;

**this**.price = price;

}

**public** String toString(){

String str;

Iterator<Author> it = authorList.iterator();

Author author;

str = name + " authored by";

**while**(it.hasNext()){

author = it.next();

str = str+" "+author.getName();

}

str = str+" costs Rs."+String.*format*("%.1f",price)+" : ";

**if**(qtyInStock == 0){

str = str+"Not Available";

}

**else**{

str = str+"Available";

}

**return** str;

}

}

# Exception Handling

## Handle Exception

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter an integer:");

String input = in.next();

**int** number;

**try**{

number = Integer.*parseInt*(input);

System.*out*.println("The square value is "+(number\*number));

System.*out*.println("The work has been done successfully");

}**catch**(NumberFormatException nfe){

System.*out*.println("Entered input is not a valid format for an integer.");

}

}

}

## Exception Handling 1

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the number of elements in the array");

**int** input = in.nextInt();

**int**[] number = **new** **int**[input];

System.*out*.println("Enter the elements in the array");

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

number[i] = in.nextInt();

}

System.*out*.println("Enter the index of the array element you want to access");

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

**try**{

**int** output = number[index];

System.*out*.println("The array element at index "+index+" = "+output);

System.*out*.println("The array element successfully accessed");

}**catch**(ArrayIndexOutOfBoundsException e){

System.*out*.println("java.lang.ArrayIndexOutOfBoundsException");

}

}

}

## Exception Handling 2

**import** java.io.BufferedReader;

**import** java.io.IOException;

**import** java.io.InputStreamReader;

**public** **class** Main {

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

BufferedReader reader = **new** BufferedReader(**new** InputStreamReader(System.*in*));

**try** {

System.*out*.println("Enter the number of elements in the array");

String input = reader.readLine();

**int** size = Integer.*parseInt*(input);

**int**[] array = **new** **int**[size];

System.*out*.println("Enter the elements in the array");

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

input = reader.readLine();

array[i] = Integer.*parseInt*(input);

}

System.*out*.println("Enter the index of the array element you want to access");

input = reader.readLine();

**int** index = Integer.*parseInt*(input);

System.*out*.println("The array element at index "+index+" = "+array[index]);

System.*out*.println("The array element successfully accessed");

} **catch** (Exception e) {

String[] str = e.getClass().toString().split(" ");

System.*out*.println(str[1]);

} **finally**{

**try** {

reader.close();

} **catch** (IOException e) {

e.printStackTrace();

}

}

}

}

## Exception Handling 3

**import** java.io.BufferedReader;

**import** java.io.IOException;

**import** java.io.InputStreamReader;

**public** **class** Main {

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

BufferedReader reader = **new** BufferedReader(**new** InputStreamReader(System.*in*));

**try** {

System.*out*.println("Enter the number of elements in the array");

String input = reader.readLine();

**int** size = Integer.*parseInt*(input);

**int**[] array = **new** **int**[size];

System.*out*.println("Enter the elements in the array");

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

input = reader.readLine();

array[i] = Integer.*parseInt*(input);

}

System.*out*.println("Enter the index of the array element you want to access");

input = reader.readLine();

**int** index = Integer.*parseInt*(input);

System.*out*.println("The array element at index "+index+" = "+array[index]);

System.*out*.println("The array element successfully accessed");

} **catch** (IOException e) {

System.*out*.println("IOException caught");

}**catch**(ArrayIndexOutOfBoundsException e){

System.*out*.println("ArrayIndexOutOfBoundsException caught");

}**catch**(NumberFormatException e){

System.*out*.println("NumberFormatException caught");

}

**finally**{

**try** {

reader.close();

} **catch** (IOException e) {

e.printStackTrace();

}

}

}

}

## Exception Handling 4

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the 2 numbers");

**int** a = in.nextInt();

**int** b = in.nextInt();

**try**{

**int** q = a/b;

System.*out*.println("The quotient of "+a+"/"+b+" = "+q);

}**catch**(ArithmeticException e){

System.*out*.println("DivideByZeroException caught");

}

**finally**{

System.*out*.println("Inside finally block");

}

}

}

## Exception Handling 5

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter your age");

**int** age = in.nextInt();

**try**{

**if**(age<19){

**throw** **new** InvalidAgeException("Exception occured: InvalidAgeException: not valid");

}

**else**{

System.*out*.println("welcome to vote");

}

}**catch**(InvalidAgeException e){

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

}

}

}

**InvalidAgeException.java**

**public** **class** InvalidAgeException **extends** Exception {

**private** **static** **final** **long** *serialVersionUID* = 1L;

**public** InvalidAgeException(**final** String message) {

**super**(message);

}

**public** InvalidAgeException(**final** Throwable exception) {

**super**(exception);

}

**public** InvalidAgeException(**final** String message,

**final** Throwable exception) {

**super**(message, exception);

}

}

# IO Streams

## File: Copy

**import** java.io.File;

**import** java.io.FileInputStream;

**import** java.io.FileNotFoundException;

**import** java.io.FileOutputStream;

**import** java.io.IOException;

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the input file name");

String inputFile = in.nextLine();

System.*out*.println("Enter the output file name");

String outputFile = in.nextLine();

FileInputStream fis;

FileOutputStream fos;

**try** {

fis = **new** FileInputStream(**new** File(inputFile));

fos = **new** FileOutputStream(**new** File(outputFile));

**byte**[] buffer = **new** **byte**[1024];

**int** length;

**while** ((length = fis.read(buffer)) > 0) {

fos.write(buffer, 0, length);

}

} **catch** (FileNotFoundException e) {

e.printStackTrace();

} **catch**(IOException e){

e.printStackTrace();

}

}

}

## File: Count Character

**import** java.io.File;

**import** java.io.FileNotFoundException;

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the file name");

String inputFile = in.nextLine();

System.*out*.println("Enter the character to be counted");

String character = in.next();

String[] temp;

**int** count = 0;

**try**{

Scanner input = **new** Scanner(**new** File(inputFile));

**while**(input.hasNext()){

temp = input.next().split("");

**for**(String str : temp){

**if**(str.equalsIgnoreCase(character)){

count++;

}

}

}

System.*out*.println("File '"+inputFile+"' has "+count+" instances of letter '"+character+"'.");

}**catch**(FileNotFoundException e){

e.printStackTrace();

}

}

}

## File: Read Line by Line

**import** java.io.File;

**import** java.io.FileNotFoundException;

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the file name");

String inputFile = in.nextLine();

**try** {

Scanner input = **new** Scanner(**new** File(inputFile));

**while**(input.hasNextLine()){

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

}

} **catch** (FileNotFoundException e) {

e.printStackTrace();

}

}

}

# Collections

## ArrayList Java

**import** java.util.ArrayList;

**import** java.util.Iterator;

**import** java.util.List;

**import** java.util.Scanner;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** Main {

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

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

String firstName;

String lastName;

String mobile;

String email;

String address;

String str;

Set<String> emp = **new** TreeSet<String>();

System.*out*.println("Enter The Number of Employees");

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

in.nextLine();

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

System.*out*.println("Enter Employee "+i+" Details:");

System.*out*.println("Enter the Firstname");

firstName = in.nextLine();

System.*out*.println("Enter the Lastname");

lastName = in.nextLine();

System.*out*.println("Enter the Mobile");

mobile = in.nextLine();

System.*out*.println("Enter the Email");

email = in.nextLine();

System.*out*.println("Enter the Address");

address = in.nextLine();

str = String.*format*("%-15s %-15s %-15s %-30s %-15s",firstName,lastName,mobile,email,address);

emp.add(str);

}

List<String> empList = **new** ArrayList<String>(emp);

System.*out*.println("Employee List:");

System.*out*.format("%-15s %-15s %-15s %-30s %-15s\n","Firstname","Lastname","Mobile","Email","Address");

Iterator<String> it = empList.iterator();

**while**(it.hasNext()){

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

}

}

}

## Operations on String List

**import** java.util.ArrayList;

**import** java.util.Iterator;

**import** java.util.List;

**import** java.util.Scanner;

**public** **class** Main {

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

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

String item;

List<String> list = **new** ArrayList<String>();

**boolean** flag = **true**;

**boolean** flag1;

**while**(flag){

System.*out*.println("1. Insert");

System.*out*.println("2. Search");

System.*out*.println("3. Delete");

System.*out*.println("4. Display");

System.*out*.println("5. Exit");

System.*out*.println("Enter your choice :");

**int** choice = Integer.*parseInt*(in.nextLine());

**switch**(choice){

**case** 1:

System.*out*.println("Enter the item to be inserted:");

item = in.nextLine();

list.add(item);

System.*out*.println("Inserted successfully");

**break**;

**case** 2:

System.*out*.println("Enter the item to search :");

item = in.nextLine();

flag1 = *listSearch*(list,item);

**if**(flag1){

System.*out*.println("Item found in the list.");

}**else**{

System.*out*.println("Item not found in the list.");

}

**break**;

**case** 3:

System.*out*.println("Enter the item to delete :");

item = in.nextLine();

flag1 = *listDelete*(list, item);

**if**(flag1){

System.*out*.println("Deleted successfully");

}**else**{

System.*out*.println("Item does not exist.");

}

**break**;

**case** 4:

System.*out*.println("The Items in the list are :");

*listDisplay*(list);

**break**;

**case** 5:

flag = **false**;

**break**;

**default**:

flag = **false**;

}

}

}

**public** **static** **boolean** listSearch(List<String> list, String item){

Iterator<String> it = list.iterator();

**boolean** flag = **false**;

**while**(it.hasNext()){

**if**(item.equalsIgnoreCase(it.next())){

flag = **true**;

}

}

**return** flag;

}

**public** **static** **boolean** listDelete(List<String> list, String item){

List<String> temp = **new** ArrayList<String>();

**boolean** flag;

temp.add(item);

flag = *listSearch*(list, item);

**if**(flag){

list.removeAll(temp);

}

**return** flag;

}

**public** **static** **void** listDisplay(List<String> list){

Iterator<String> it = list.iterator();

**while**(it.hasNext()){

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

}

}

}

## Collect Unique Symbols From Set of Cards

**Main.java**

**import** java.util.Iterator;

**import** java.util.Scanner;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** Main {

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

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

String symbol;

String number;

Set<String> cardSet = **new** TreeSet<String>();

Set<String> symbolSet = **new** TreeSet<String>();

**int** count = 0;

**do**{

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

symbol = in.next();

number = in.next();

count++;

**if**(symbolSet.contains(symbol)){

}**else**{

symbolSet.add(symbol);

cardSet.add(**new** Card(symbol,number).toString());

}

}**while**(cardSet.size() != 4);

System.*out*.println("Four symbols gathered in "+count+" cards.");

System.*out*.println("Cards in Set are :");

Iterator<String> it = cardSet.iterator();

**while**(it.hasNext()){

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

}

}

}

**Card.java**

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

String symbol;

String number;

**public** Card(){

}

**public** Card(String symbol, String number) {

**this**.symbol = symbol;

**this**.number = number;

}

**public** String toString(){

String str = symbol+" "+number;

**return** str;

}

}

## Collect and Group Cards

**Main.java**

import java.util.ArrayList;

import java.util.HashMap;

import java.util.Iterator;

import java.util.List;

import java.util.Map;

import java.util.Scanner;

import java.util.Set;

import java.util.TreeSet;

public class Main {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

String symbol;

int number;

int i;

int sum = 0;

Map<String, List<Integer>> cardMap = new HashMap<String, List<Integer>>();

Set<String> symbolSet = new TreeSet<String>();

System.out.println("Enter Number of Cards : ");

int num = in.nextInt();

for(i =1;i<=num;i++){

System.out.println("Enter card "+i+":");

symbol = in.next();

number = in.nextInt();

symbolSet.add(symbol);

if(cardMap.containsKey(symbol)){

cardMap.get(symbol).add(number);

}else{

List<Integer> list = new ArrayList<Integer>();

list.add(number);

cardMap.put(symbol, list);

}

}

Iterator<String> itSet = symbolSet.iterator();

System.out.println("Distinct Symbols are : ");

while(itSet.hasNext()){

System.out.print(itSet.next()+" ");

}

System.out.println();

itSet = symbolSet.iterator();

Iterator<Integer> itList;

while(itSet.hasNext()){

String str = itSet.next();

itList = cardMap.get(str).iterator();

System.out.println("Cards in "+str+" Symbol");

while(itList.hasNext()){

i = itList.next();

System.out.println(str+" "+i);

sum = sum + i;

}

System.out.println("Number of cards : "+cardMap.get(str).size());

System.out.println("Sum of Numbers : "+sum);

sum = 0;

}

}

}

**Card.java**

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

String symbol;

String number;

**public** Card(){

}

**public** Card(String symbol, String number) {

**this**.symbol = symbol;

**this**.number = number;

}

**public** String toString(){

String str = symbol+" "+number;

**return** str;

}

}

## Set of Boxes

**Main.java**

**import** java.text.DecimalFormat;

**import** java.util.Iterator;

**import** java.util.Scanner;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** Main {

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

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

System.*out*.println("Enter the number of Box");

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

**double** length;

**double** width;

**double** height;

**double** volume;

String str;

Box box;

Set<Box> boxSet = **new** TreeSet<Box>();

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

System.*out*.println("Enter the Box "+i+" details");

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

length = in.nextDouble();

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

width = in.nextDouble();

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

height = in.nextDouble();

boxSet.add(**new** Box(length, width, height));

}

System.*out*.println("Unique Boxes in the Set are");

Iterator<Box> it = boxSet.iterator();

**while**(it.hasNext()){

box = it.next();

volume = box.length \* box.width \* box.height;

//System.out.format("Length =%.1f Width =%.1f Height =%.1f Volume =%.2f\n",box.length,box.width,box.height,volume);

DecimalFormat df = **new** DecimalFormat("0.0#");

DecimalFormat df1 = **new** DecimalFormat("0.0#");

String vol = df1.format(volume);

str = "Length ="+df.format(box.length)+" Width ="+df.format(box.width);

str = str+" Height ="+df.format(box.height)+" Volume ="+vol;

System.*out*.println(str);

}

}

}

**Box.java**

**public** **class** Box **implements** Comparable<Box>{

**double** length;

**double** width;

**double** height;

**public** Box(){

}

**public** Box(**double** length, **double** width, **double** height) {

**this**.length = length;

**this**.width = width;

**this**.height = height;

}

@Override

**public** **int** compareTo(Box obj) {

**double** volume1 = **this**.length \* **this**.width \* **this**.height;

**double** volume2 = obj.length \* obj.width \* obj.height;

volume1 = volume1\*100;

volume2 = volume2\*100;

**int** diff = (**int**)volume1 - (**int**)volume2;

**return** diff;

}

**public** **boolean** equals(Box obj){

**boolean** flag = **false**;

**double** volume1 = **this**.length \* **this**.width \* **this**.height;

**double** volume2 = obj.length \* obj.width \* obj.height;

**if**((volume1-volume2) == 0){

flag = **true**;

}

**return** flag;}}

# Multithreading

## Multithreading

**Main.java**

**import** java.util.Scanner;

**public** **class** Main {

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

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

System.*out*.println("Enter the Degree for Sin : ");

**double** sinDeg = in.nextDouble();

System.*out*.println("Enter the Degree for Cos : ");

**double** cosDeg = in.nextDouble();

System.*out*.println("Enter the Degree for Tan : ");

**double** tanDeg = in.nextDouble();

SineClass s = **new** SineClass(sinDeg);

CosClass c = **new** CosClass(cosDeg);

TanClass t = **new** TanClass(tanDeg);

**try** {

s.t.join();

c.t.join();

t.t.join();

} **catch** (InterruptedException e) {

e.printStackTrace();

}

**double** p = s.sin+c.cos+t.tan;

String str = String.*format*("%.2f", p);

System.*out*.println("Sum of sin, cos, tan = "+str);

}

}

**SineClass.java**

**public** **class** SineClass **implements** Runnable{

**double** sin;

**double** sinDeg;

Thread t;

**public** SineClass(){

}

**public** SineClass(**double** sinDeg){

**this**.sinDeg = sinDeg;

t = **new** Thread(**this** , "Sin Class");

t.start();

}

@Override

**public** **void** run() {

**try** {

**this**.sin = Math.*sin*(Math.*toRadians*(sinDeg));

Thread.*sleep*(1000);

} **catch** (InterruptedException e) {

}

}

}

**CosClass.java**

**public** **class** CosClass **implements** Runnable{

**double** cos;

**double** cosDeg;

Thread t;

**public** CosClass(){

}

**public** CosClass(**double** cosDeg){

**this**.cosDeg = cosDeg;

t = **new** Thread(**this** , "Cos Class");

t.start();

}

@Override

**public** **void** run() {

**try** {

**this**.cos = Math.*cos*(Math.*toRadians*(cosDeg));

Thread.*sleep*(1000);

} **catch** (InterruptedException e) {

}

}

}

**TanClass.java**

**public** **class** TanClass **implements** Runnable{

**double** tan;

**double** tanDeg;

Thread t;

**public** TanClass(){

}

**public** TanClass(**double** tanDeg){

**this**.tanDeg = tanDeg;

t = **new** Thread(**this** , "Tan Class");

t.start();

}

@Override

**public** **void** run() {

**try** {

**this**.tan = Math.*tan*(Math.*toRadians*(tanDeg));

Thread.*sleep*(1000);

} **catch** (InterruptedException e) {

}

}

}

## Runnable Synchronized Vowel Counter

**Main.java**

**import** java.util.Iterator;

**import** java.util.Scanner;

**import** java.util.Set;

**import** java.util.TreeSet;

**public** **class** Main {

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

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

String vowelKey;

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

**int** num = Integer.*parseInt*(in.nextLine());

Counter[] countArray = **new** Counter[num];

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

System.*out*.println("Enter text for counter "+(i+1)+" :");

String text = in.nextLine();

countArray[i] = **new** Counter(text);

**try** {

countArray[i].t.join();

} **catch** (InterruptedException e) {

// **TODO** Auto-generated catch block

e.printStackTrace();

}

}

System.*out*.println("Vowels count in given text are :");

Set<String> keys = **new** TreeSet<String>();

keys.addAll(Counter.*vowelMap*.keySet());

Iterator<String> it = keys.iterator();

**while**(it.hasNext()){

vowelKey = it.next();

System.*out*.print(vowelKey + ":" + Counter.*vowelMap*.get(vowelKey)+" ");

}

}

}

**Counter.java**

**import** java.util.HashMap;

**import** java.util.Map;

**public** **class** Counter **implements** Runnable{

**public** **static** Map<String,Integer> *vowelMap* = **new** HashMap<String,Integer>();

**static**{

Counter.*vowelMap*.put("a", 0);

Counter.*vowelMap*.put("e", 0);

Counter.*vowelMap*.put("i", 0);

Counter.*vowelMap*.put("o", 0);

Counter.*vowelMap*.put("u", 0);

}

**int** count;

String text;

String temp;

Thread t = **new** Thread(**this**,"Counter");

**public** Counter(){

}

**public** Counter(String text){

**this**.text = text;

t.start();

}

@Override

**public** **void** run() {

String[] charArray = text.split("");

**try** {

**for**(String ch : charArray){

temp = ch.toLowerCase();

**if**(Counter.*vowelMap*.containsKey(temp)){

count = Counter.*vowelMap*.get(temp);

count++;

Counter.*vowelMap*.put(temp, count);

}

}

Thread.*sleep*(100);

} **catch** (InterruptedException e) {

// **TODO** Auto-generated catch block

e.printStackTrace();

}

}}

## Character Frequency Multiple Threads

**Main.java**

import java.util.Scanner;

import java.util.logging.Level;

import java.util.logging.Logger;

public class Main {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

String str = "";

int count = 0;

System.out.println("Enter Number of Counters :");

count = in.nextInt();

in.nextLine();

Counter a[] = new Counter[count] ;

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

System.out.println("Enter text for counter " + (i + 1) + " :");

str = in.next();

a[i]= new Counter(str);

}

try {

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

a[i].t.join();

}

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

System.out.println("Counter "+(i+1)+" Result :");

a[i].display();

}

} catch (InterruptedException ex) {

Logger.getLogger(Main.class.getName()).log(Level.SEVERE, null, ex);

}

}

}

**Counter.java**

import java.util.Arrays;

import java.util.HashMap;

import java.util.Iterator;

import java.util.Set;

public class Counter extends Thread {

String data;

public HashMap<Character,Integer> hs = new HashMap<Character, Integer>();

Thread t;

Double s;

Counter(String s) {

this.data = s;

t = new Thread(this, "c");

t.start();

}

public void addList(Character ch){

Integer count = this.hs.get(ch);

count=(count==null)?1:count+1;

this.hs.put(ch, count);

}

@Override

public void run() {

try {

char ch;

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

ch = data.charAt(i);

this.addList(ch);

}

Thread.sleep(100);

} catch (InterruptedException e) {

}

}

public synchronized void display(){

Set<Character> set= this.hs.keySet();

char arr[]= new char[set.size()];

int i=0;

char ch;

for(Iterator it = set.iterator();it.hasNext() ;i++){

ch = (Character) it.next();

arr[i]=ch;

}

Arrays.sort(arr);

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

System.out.print(arr[i]+":"+this.hs.get(arr[i])+" ");

}

System.out.println();

}

}