//Prog 1

import java.util.Scanner;

class QuadraticEq

{

public static void main(String args[])

{

double a;

double b;

double c;

double root1,root2;

Scanner SS=new Scanner(System.in);

System.out.print("Enter the values of a,b,c");

a=SS.nextDouble();

b=SS.nextDouble();

c=SS.nextDouble();

double determinant=b\*b-4\*a\*c;

{

if(a==0)

System.out.print("It is not a quadratic equation");

else

{

if(determinant>0)

{

root1=((-b+Math.sqrt(determinant))/2\*a);

root2=((-b-Math.sqrt(determinant))/2\*a);

System.out.print("The roots are distinct and real:"+root1+"and "+root2);

}

if(determinant==0)

{

root1=root2=-b/2\*a;

System.out.print("The roots are equal:"+root1);

}

if(determinant<0)

{

root1=((-b+Math.abs(Math.sqrt(determinant)))/2\*a);

root2=((-b-Math.abs(Math.sqrt(determinant)))/2\*a);

System.out.print("the roots are imaginary:"+"i"+root1+" "+"i"+root2);

}

}

}

}

}

//Prog 2

import java.util.Scanner;

public class Student {

public static void main(String[] args) {

Scanner s = new Scanner(System.in);

int choice;

Student s1 = new Student();

System.out.print("Enter USN: ");

s1.usn = s.nextInt();

s.nextLine();

System.out.print("Enter name: ");

s1.name = s.nextLine();

do{

System.out.print("Enter\n1. Set Marks 2. Set Credits 3. Display SGPA 4. Display Details 5. Exit: ");

choice = s.nextInt();

switch(choice){

case 1:

s1.setMarks();

break;

case 2:

s1.setCredits();

break;

case 3:

s1.sgpaCalc();

break;

case 4:

s1.displayDetails();

break;

default:

System.out.println("INCORRECT CHOICE!");

break;

}

}while(choice!=5);

}

}

class Student {

Scanner s = new Scanner(System.in);

int usn;

String name;

int credits[] = new int[6];

int marks[] = new int[6];

int creditScore[] = new int[6];

void setMarks() {

for (int i = 1; i <= 6; i++){

System.out.print("Enter marks of subject " + i + ": ");

marks[i - 1] = s.nextInt();

}

System.out.println();

}

int[] getMarks() {

return marks;

}

void setCredits() {

for (int i = 1; i <= 6; i++){

System.out.print("Enter credits of subject " + i + ": ");

credits[i - 1] = s.nextInt();

}

}

int[] getCredits() {

return marks;

}

void setCreditScore(){

for(int i = 0; i<6; i++) {

if (marks[i] >= 90)

creditScore[i] = 10;

else if (marks[i] >= 80)

creditScore[i] = 9;

else if (marks[i] >= 70)

creditScore[i] = 8;

else if (marks[i] >= 60)

creditScore[i] = 7;

else if (marks[i] >= 50)

creditScore[i] = 6;

else if (marks[i] >= 40)

creditScore[i] = 5;

else

creditScore[i] = 0;

}

}

void sgpaCalc(){

this.setCreditScore();

Float sgpa = 0f;

int cred = 0;

for(int i = 0; i<6; i++)

cred = cred + credits[i];

for(int i = 0; i<6; i++){

sgpa = sgpa + credits[i]\*creditScore[i];

}

System.out.println("SGPA is " + (Float)sgpa/cred);

}

void displayDetails(){

System.out.println("Details of USN: " + usn);

System.out.println(name);

for(int i = 0; i<6; i++){

System.out.println("Marks of subject " + (i+1)+ "is = " + marks[i]);

}

sgpaCalc();

}

}

//Prog 3

import java.io.\*;

import java.util.\*;

class Book {

String title, author;

double price;

int numPages;

Book() {

title="Default";

author="Default";

price=0.0;

numPages=0;

}

void setTitle(String t) {

title=t;

}

void setAuthor(String a) {

author=a;

}

void setPrice(double p) {

price=p;

}

void setPages(int np) {

numPages=np;

}

public String toString() {

return title+"\t"+author+"\t"+price+"\t"+numPages+"\n";

}

}

class BookDetails {

public static void main(String args[]) {

String t, a;

double p;

int np,n;

Scanner sc = new Scanner(System.in);

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

n = sc.nextInt();

Book b[]= new Book[n];

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

System.out.println("Enter the Title of the Books");

t= sc.next();

System.out.println("Enter the Author of the Books");

a= sc.next();

System.out.println("Enter the Price of the Books");

p= sc.nextDouble();

System.out.println("Enter the Number of pages of the Books");

np= sc.nextInt();

b[i] = new Book();

b[i].setTitle(t);

b[i].setAuthor(a);

b[i].setPrice(p);

b[i].setPages(np);

}

System.out.println("Title \t Author \t Price \t Pages\n");

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

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

}

}

}

//Prog 4

import java.util.\*;

import java.lang.Math.\*;

abstract class shape{

public int a;

public int b;

abstract public void printArea();

Scanner s=new Scanner(System.in);

}

class rectangle extends shape{

public void printArea(){

System.out.print("Enter length and breadth of rectangle: ");

float a=s.nextFloat();

float b=s.nextFloat();

float area=a\*b;

System.out.println("Area="+area+"sq.units");

}

}

class triangle extends shape{

public void printArea(){

System.out.print("Enter three sides of triangle: ");

float a=s.nextFloat();

float b=s.nextFloat();

float c=s.nextFloat();

float d=(a+b+c)/2;

double area=Math.sqrt(d\*(d-a)\*(d-b)\*(d-c));

System.out.println("Area="+area+"sq.units");

}

}

class circle extends shape{

public void printArea(){

System.out.print("Enter radius of circle: ");

float a=s.nextFloat();

float area=22/7\*a\*a;

System.out.println("Area="+area+"sq.units");

}

}

class Figure{

public static void main(String args[]){

shape r=new rectangle();

shape t=new triangle();

shape c=new circle();

for(int i=0;i<100;i++){

System.out.println("\n1)Triangle\n2)Rectangle\n3)Circle");

System.out.println("Enter your choice: ");

Scanner s=new Scanner(System.in);

int ch=s.nextInt();

switch(ch){

case 1: t.printArea();

break;

case 2: r.printArea();

break;

case 3: c.printArea();

break;

default: System.out.println("Invalid choice");

}

}

}

}

//Prog 5

import java.util.\*;

class bank

{

public String name;

public int acc\_no;

public float bal;

public float si;

public void accept()

{

Scanner s=new Scanner(System.in);

System.out.print("\nEnter the name of the account holder: ");

name=s.next();

System.out.print("Enter the account number: ");

acc\_no=s.nextInt();

System.out.print("Enter the account balance: ");

bal=s.nextFloat();

}

public void display()

{

System.out.println("\*Details\*");

System.out.println("Name: "+name+"\nAccount number: "+acc\_no+"\nBalance: "+bal);

}

public void simple\_interest()

{

System.out.println("\nRate of interest= 8%");

si=(bal\*8)/100;

System.out.println("Simple interest(for one year)= Rs"+si);

}

}

class savings extends bank

{

public void cheque()

{

System.out.println("\nNo cheque services");

}

public void withdrawal()

{

float amount;

Scanner a=new Scanner(System.in);

System.out.println("\nNo minimun balance required");

System.out.print("Enter the amount to be withdrawm: ");

amount=a.nextFloat();

if(amount>super.bal)

{

System.out.println("Balance is insufficient");

}

else

{

super.bal=super.bal-amount;

System.out.println(amount+" withdrawm");

System.out.println("Available balance= "+super.bal);

}

}

}

class current extends bank

{

public void cheque()

{

System.out.println("\nCheque services available");

}

public void withdrawal()

{

float amount;

Scanner a=new Scanner(System.in);

System.out.println("\nMinimun balance= Rs.1000.00");

if(super.bal<1000)

{

System.out.println("Balance is insufficient to withdraw");

float service\_charge;

service\_charge=(1\*super.bal)/100;

super.bal=super.bal-service\_charge;

System.out.println("Service charge of Rs"+service\_charge+" is added");

System.out.println("Available balance= Rs"+super.bal);

}

else

{

System.out.print("Enter the amount to be withdrawm: ");

amount=a.nextFloat();

if(amount>(super.bal-1000))

{

System.out.println("Balance is insufficient");

}

else

{

super.bal=super.bal-amount;

System.out.println(amount+" withdrawm");

System.out.println("Available balance= "+super.bal);

}

}

}

}

class Main

{

public static void main(String args[])

{

savings obj1[]=new savings[3];

current obj2[]=new current[3];

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

Scanner x=new Scanner(System.in);

int n=x.nextInt();

int i=0;

int j=0;

int k=0;

while(i<n)

{

System.out.println("\nAccount "+(i+1));

System.out.println("\n1)Savings\n2)Current");

System.out.print("Enter the type of account: ");

int ch=x.nextInt();

if(ch==1)

{

obj1[j]=new savings();

obj1[j].accept();

obj1[j].display();

obj1[j].cheque();

obj1[j].simple\_interest();

obj1[j].withdrawal();

j++;

}

else

{

obj2[k]=new current();

obj2[k].accept();

obj2[k].display();

obj2[k].cheque();

obj2[k].simple\_interest();

obj2[k].withdrawal();

k++;

}

i++;

}

}

}

//Prog 6

import java.util.Scanner;

class WrongAgeException extends Exception {

WrongAgeException() {

}

}

class InvalidAgeException extends Exception {

InvalidAgeException(String st) {

super(st);

}

}

class Father {

int fage;

Father() {

}

Father(int age) throws WrongAgeException {

this.fage = age;

if (age <= 0) {

throw new WrongAgeException();

}

}

public String toString() {

return "Exception1 handled";

}

}

class Son extends Father {

int sage;

Son(int sonage) throws InvalidAgeException {

this.sage = sonage;

if (sage >= fage) {

throw new InvalidAgeException("Son's age exceeds father's age");

}

}

public String toString() {

return "Exception2 handled";

}

}

public class Excep {

public static void main(String[] args) {

try {

Scanner sc = new Scanner(System.in);

System.out.println("Enter father's age");

int age = sc.nextInt();

new Father(age);

System.out.println("Enter son's age");

int sonage = sc.nextInt();

new Son(sonage);

sc.close();

} catch (WrongAgeException e) {

System.out.println(e);

} catch (InvalidAgeException e1) {

System.out.println(e1);

}

}

}

//Prog 7

import java.lang.Thread;

class Mythread extends Thread{

public void run(){

try{

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

System.out.println("CSE");

Thread.sleep(2000);

}

}catch(InterruptedException e){

System.out.println("Child thread interrupted");

}

}

}

public class Threaddemo {

public static void main(String[] args){

Mythread t= new Mythread();

t.start();

try{

for(int i=0;i<2;i++){

System.out.println("BMS College of Engineering");

Thread.sleep(10000);

}

}catch(InterruptedException e){

System.out.println("Main thread interrupted");

}

}

}

//Prog 8

import java.util.\*;

import java.util.InputMismatchException;

interface z{

int calc(int a,int b);

}

class Y implements z{

public int calc(int a, int b){

int c=a/b;

return c;

}

}

public class Pro8{

public static void main(String args[]){

Scanner sc = new Scanner(System.in);

Y y=new Y();

int num1,num2;

try{

System.out.println("Enter 2 numbers");

num1=sc.nextInt();

num2=sc.nextInt();

int c= y.calc(num1,num2);

System.out.println("Quotient "+c);

}

catch(ArithmeticException|InputMismatchException e)

{System.out.println("Exception "+e);}

}

}