## Part A

1. Arithmetic Overloading

**package** JP;

**import** java.util.Scanner;

**public** **class** Arithmeticoveload {

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

**int** a,b,c;

System.***out***.println("enter 3 values");

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

a=sc.nextInt();

b=sc.nextInt();

c=sc.nextInt();

**int** result1 = a + b \* c;

**int** result2 = a / (b \* c);

**int** result3 = a % (b + c);

System.***out***.println("without overriding");

System.***out***.println("Result 1: " + result1);

System.***out***.println("Result 2: " + result2);

System.***out***.println("Result 3: " + result3);

CustomInt aObj = **new** CustomInt(a);

CustomInt bObj = **new** CustomInt(b);

CustomInt cObj = **new** CustomInt(c);

System.***out***.println("with overriding");

CustomInt result4 = aObj.add(bObj).multiply(cObj);

CustomInt result5 = aObj.divide(bObj).multiply(cObj);

CustomInt result6 = aObj.modulo(bObj).add(cObj);

System.***out***.println("Result 4: " +result4.getValue());

System.***out***.println("Result 5: " +result5.getValue());

System.***out***.println("Result 6: " +result6.getValue());

sc.close();

}

}

**class** CustomInt {

**private** **int** value;

**public** CustomInt(**int** value) {

**this**.value = value;

}

**public** **int** getValue() {

**return** **this**.value;

}

**public** CustomInt add(CustomInt other) {

**int** newValue = **this**.value + other.value;

**return** **new** CustomInt(newValue);

}

**public** CustomInt subtract(CustomInt other) {

**int** newValue = **this**.value - other.value;

**return** **new** CustomInt(newValue);

}

**public** CustomInt multiply(CustomInt other) {

**int** newValue = **this**.value \* other.value;

**return** **new** CustomInt(newValue);

}

**public** CustomInt divide(CustomInt other) {

**int** newValue = **this**.value / other.value;

**return** **new** CustomInt(newValue);

}

**public** CustomInt modulo(CustomInt other) {

**int** newValue = **this**.value % other.value;

**return** **new** CustomInt(newValue);

}

}

1. Dd/mm/yy

package JP;

import java.text.DateFormat;

import java.text.SimpleDateFormat;

import java.util.Scanner;

public class DateValid {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("Enter a date in dd/mm/yyyy format");

String date = sc.next();

if(dateValidation(date)==true)

System.out.println("Date is valid");

else

System.out.println("Date is invalid");

}

private static boolean dateValidation(String date)

{

boolean status = false;

if (checkDate(date)) {

DateFormat dateFormat = new

SimpleDateFormat("dd/MM/yyyy");

dateFormat.setLenient(false);

try {

dateFormat.parse(date);

status = true;

} catch (Exception e) {

status = false;

}

}

return status;

}

static boolean checkDate(String date) {

String pattern = "(0?[1-9]|[12][0-9]|3[01])\\|(0?[1-9]|[0-2])\\|([0-9]{4})";

boolean flag = false;

if (date.matches(pattern)) {

flag = true;

}

return flag;

}

}

1. Pattern

**package** JP;

**public** **class** pattern1 {

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

{

**int** r,c;

**for**(r=1;r<=5;r++)

{

**for**(c=4;c>=r;c--)

{

System.out.print(" ");

}

**for**(c=1;c<=r;c++)

{

System.out.print(r+" ");

}

System.out.println();

}

}

}

1. FIbonacci

**package** JP;

**import** java.util.Scanner;

**public** **class** fib {

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

{

**int** n,f1=0,f2=1;

System.out.println("Fibbonacci series till n");

System.out.println("Enter the value for n");

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

n=sc.nextInt();

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

{

System.out.print(f1+" \n ");

**int** f3=f1+f2;

f1=f2;

f2=f3;

}

}

}

1. Multipli

**package** JP;

**import** java.util.Scanner;

**public** **class** mult {

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

{

**int** m,n;

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

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

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

System.out.print("Enter range from m");

m=s.nextInt();

System.out.print("Enter range up to n");

n=s.nextInt();

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

{

System.out.println(num+"\*"+i+"="+num\*i);

}

s.close();

}

}

1. Static method

**package** JP;

**import** java.util.Scanner;

**public** **class** Staticmem

{

**static** **double** l;

**static** **double** w;

**static** **double** h;

**static** **double** vol;

**static** **double** volume(**double** l1, **double** w1, **double** h1)

{

System.out.println("volume of a box");

vol=l\*w\*h;

**return** vol;

}

**static** {

System.out.println("static block initialized");

}

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

{

System.out.println("enter length");

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

l=sc.nextDouble();

System.out.println("enter breadth");

Scanner sc1=**new** Scanner(System.in);

w=sc1.nextDouble();

System.out.println("enter height");

Scanner sc2=**new** Scanner(System.in);

h=sc2.nextDouble();

vol=volume(l,w,h);

System.out.println(vol);

}

}

1. Average of 3 numbers

**package** JP;

**import** java.util.Scanner;

**class** Student{

**int** regno;

**int** marks1;

**int** marks2;

**int** marks3;

**double** avg;

**double** getavgCal()

{

**return** (marks1+marks2+marks3)/3;

}

**void** setMarks(**int** m1, **int** m2, **int** m3)

{

marks1=m1;

marks2=m2;

marks3=m3;

}

}

**public** **class** StudentMain{

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

Student s = **new** Student();

**double** percent;

**int** s1,s2,s3;

System.***out***.println("enter subject1 marks");

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

s1=sc.nextInt();

System.***out***.println("enter subject2 marks");

Scanner sc1= **new** Scanner(System.***in***);

s2=sc.nextInt();

System.***out***.println("enter subject2 marks");

Scanner sc2= **new** Scanner(System.***in***);

s3=sc.nextInt();

s.setMarks(s1,s2,s3);

percent=s.getavgCal();

System.***out***.println("Result is ");

**if**(s1<5 || s2<35 || s3<35)

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

**else**

System.***out***.println("Promoted with ");

System.***out***.println("Average of the current sem="+percent);

sc.close();

}

}

1. Bank acct

**package** JP;

**import** java.io.\*;

**class** BankAcc

{

**private** **double** bal;

BankAcc(**double** b)

{

bal=b;

}

**void** contact(**double** r) **throws** IOException

{

BufferedReader br = **new** BufferedReader(**new** InputStreamReader(System.***in***));

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

String passwd= br.readLine();

**if** (passwd.equals ("xyz123"))

{

Interest in = **new** Interest(r);

in.calculateInterest();

}

**else**

{

System.***out***.println("Access denied");

**return**;

}

}

**private** **class** Interest

{

**private** **double** rate;

Interest (**double** r)

{

rate=r;

}

**void** calculateInterest()

{

**double** interest= bal\* rate/100;

bal+= interest;

System.***out***.println("Balance is "+bal);

}

}

}

**public** **class** BankAcct

{

**public** **static** **void** main(String[] args) **throws** IOException

{

BankAcc account=**new** BankAcc(10000);

account.contact(9.5);

}

}

1. DMD

package JP;

import java.util.Scanner;

import java.math.\*;

class A {

double x,y;

void display() {

System.out.println("Inside A's display method"); }

}

class B extends A {

void display() {

System.out.println("Inside B's display method"); }

}

class C extends A {

void display() {

System.out.println("Inside C's display method"); }

}

class DMD {

public static void main(String args[]) {

A a = new A();

B b = new B();

C c = new C();

A r;

r = a;

r.display();

r = b;

r.display();

r = c;

r.display();

}

}

1. Bil

**package** JP;

**import** java.util.Scanner;

**class** Commercial

{

**void** calculateBill (**int** units)

{

System.***out***.println ("Commercial connection bill"); System.***out***.println ("Bill amount=" + units \* 5.00);

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

}

}

**class** Domestic **extends** Commercial

{

**void** calculateBill (**int** units){

System.***out***.println ("Domestic connection bill");

System.***out***.println ("Bill amount=" + units \* 2.50);

}

}

**public** **class** Bill {

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

Commercial c = **new** Commercial ();

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

System.***out***.println ("Commercial connection bill");

System.***out***.println("enetr units");

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

c.calculateBill (amount);

Domestic d = **new** Domestic();

System.***out***.println ("Domestic connection bill");

System.***out***.println ("enter units");

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

d.calculateBill (amt);

}

}

l