**Task No. 1:** By looking at the formulae for an ellipse, provide the missing code for all of the methods in the class Ellipse including the toString() method. Test your program by calling the methods of all eccentric shapes. Your output should look as follows (for an ellipse with *a* = 10 and *b* = 7)

**Solution:**

**Main Method:**

package lab12;

public class Lab12 {

public static void main(String[] args) {

// TODO code application logic here

Ellipse e =new Ellipse(80,80);

e.String();

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

Circle c=new Circle(10.0);

c.String();

}

}

**Class: (Encentric)**

package lab12;

public interface Incentric {

double eccentricity();

}

**Class: (Shape)**

package lab12;

public abstract class shape {

public abstract double area();

public abstract double perimeter();

public abstract void String();

}

**Class: (Ellipse)**

package lab12;

public class Ellipse extends shape implements Incentric {

double a, b;

public Ellipse(double s1, double s2){

if(s1 < s2) {

a = s2;

b = s1;

}

else {

a = s1;

b = s2;

}

}

public double area() {

//method body missing

double area= Math.PI\*a\*b;

return area;

}

public double perimeter() {

//method body missing

double perimeter=Math.sqrt((2\*(Math.pow(a, 2)+Math.pow(b, 2))-Math.pow(a-b, 2)/2));

return perimeter;

}

public void String() {

System.out.println("Area:"+area()+"\nPerimeter:"+perimeter()+"\nEccentricity:"+eccentricity());

}

public double eccentricity() {

//method body missing

double eccen=Math.sqrt(1-(Math.pow(b, 2)/Math.pow(a, 2)));

return eccen;

}

}

**Class: (Circle)**

package lab12;

public class Circle extends Ellipse {

public Circle(double radius){

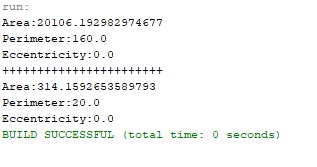
super(radius, radius);

}

}

}

**Output:**



**Task No. 2:** Write a program which implements a interface of Banking System by having all standard functionalities and will be implemented by branches.

**Hint:(Interface Methods)**

CreateAccount()

Search Account details()

Update CustInfo()

Cash Withdraw()

Cash Deposit()

**Solution:**

**Main Method:**

package task\_no2;

public class Task\_no2 {

public static void main(String[] args) {

Bank ublBank = new UBL();

ublBank.CreateAccount();

ublBank.SearchAccountDetails(2);

ublBank.UpdateCustomerInfo(2, "Raja Muhammad Hammad", 10000);

ublBank.CashWithdraw(2, 1100);

ublBank.CashDeposit(2, 1200);

Bank askariBank = new AskariBank();

askariBank.CreateAccount();

askariBank.SearchAccountDetails(1);

askariBank.UpdateCustomerInfo(1, "Qazi Khizar Ali", 1000000);

askariBank.CashWithdraw(1, 2000);

askariBank.CashDeposit(1, 5000); }}

**Class: (Bank)**

package task\_no2;

public interface Bank {

void CreateAccount();

void SearchAccountDetails(int id);

void UpdateCustomerInfo(int id, String name, int bal);

void CashWithdraw(int id, int cash);

void CashDeposit(int id, int cash);

}

**Class: (UBL)**

package task\_no2;

public class UBL implements Bank{

int id=2;

String name="Raja Muhammad Hammad";

int bal=10000;

public void CreateAccount(){

System.out.println("Your account has been created in UBL bank successfully...");

}

public void SearchAccountDetails(int id){

System.out.println("Searching account details for id # "+id);

}

public void UpdateCustomerInfo(int id, String name, int bal){

this.id=id;

this.name=name;

this.bal=bal;

}

public void CashWithdraw(int id, int cash){

bal=bal-cash;

System.out.println("ID # "+id+" has withdrawn "+cash+" PKR");

}

public void CashDeposit(int id, int cash){

bal=bal+cash;

System.out.println("ID # "+id+" has deposited "+cash+" PKR");

}

}

**Class: (Askari Bank)**

package task\_no2;

public class AskariBank implements Bank{

int id=1;

String name="Qazi Khizar Ali";

int bal=10000;

public void CreateAccount(){

System.out.println("Your account has been created in UBL bank successfully...");

}

public void SearchAccountDetails(int id){

System.out.println("Searching account details for id # "+id);

}

public void UpdateCustomerInfo(int id, String name, int bal){

this.id=id;

this.name=name;

this.bal=bal;

}

public void CashWithdraw(int id, int cash){

bal=bal-cash;

System.out.println("ID # "+id+" has withdrawn "+cash+" PKR");

}

public void CashDeposit(int id, int cash){

bal=bal+cash;

System.out.println("ID # "+id+" has deposited "+cash+" PKR");

}

}

**Output:**

