**TASK 10**

**Java OOPS**

**Task Description:**

**Solve the below problems using OOPs concept using Java.**

**1. Create a class called "Person" with attributes "name" and "age". Also create a constructor**

**and getter methods for the attributes**.

|  |
| --- |
| **package** task10;  **import** java.util.Scanner;  **public** **class** Person {  String name;  **int** age;    **public** String getName() {  **return** name;  }  **public** **int** getAge() {  **return** age;  }  **public** Person(String name, **int** age) {  **super**();  **this**.name = name;  **this**.age = age;  }    **public** **static** **void** main(String[] args) {  System.***out***.println("Please enter the Name and age:");  Scanner scan=**new** Scanner(System.***in***);  Person p= **new** Person(scan.nextLine(),scan.nextInt());  System.***out***.println("Name: "+p.getName()+" Age: "+p.getAge());  scan.close();  }  } |

**OUTPUT:**

Please enter the Name and age:

JAI

25

Name: JAI Age: 25

**2. Employee class with the attributes id, name, and salary, and includes a method called raiseSalary(percent) that updates the salary by a specified percentage**

|  |
| --- |
| **package** task10;  **import** java.util.Scanner;  **public** **class** Employee {  **int** id,salary;  String firstName,lastName;  **public** Employee(**int** id, **int** salary, String firstName, String lastName) {  **super**();  **this**.id = id;  **this**.salary = salary;  **this**.firstName = firstName;  **this**.lastName = lastName;  }  **public** **int** getId() {  **return** id;  }  **public** String getFirstName() {  **return** firstName;  }  **public** String getLastName() {  **return** lastName;  }  **public** String name() {  **return** firstName+" "+lastName;  }  **public** **int** getSalary() {  **return** salary;  }  **public** **void** setSalary(**int** salary) {  **this**.salary = salary;  }  **public** **int** getAnnualSalary() {  **return** salary\*12;  }  **public** **int** raiseSalary(**int** percentage) {  **return** getAnnualSalary()+(getAnnualSalary()\*percentage/100);  }    @Override  **public** String toString() {  **return** "Employee [id=" + id + ", salary=" + salary + ", Name=" + firstName +" "+ lastName+ "]";  }    **public** **static** **void** main(String args[]) {  Scanner scan =**new** Scanner(System.***in***);  **int** a,b,i;  String c,d;  System.***out***.println("Enter the id:");  a=scan.nextInt();  System.***out***.println("Enter the Salary:");  b=scan.nextInt();  System.***out***.println("Enter the Increment Percentage:");  i=scan.nextInt();  System.***out***.println("Enter the First Name:");  c=scan.next();  System.***out***.println("Enter the Last Name:");  d=scan.next();  Employee e=**new** Employee(a, b, c, d);  System.***out***.println(e.toString());  System.***out***.println("Post Increment total salary per year is :"+e.raiseSalary(i));  scan.close();  }  } |

**OUTPUT:**

Enter the id:

9215

Enter the Salary:

45000

Enter the Increment Percentage:

20

Enter the First Name:

Jai

Enter the Last Name:

Kumar

Employee [id=9215, salary=45000, Name=Jai Kumar]

Post Increment total salary per year is :648000

**3. Create a class circle with radius as data member. Create two constructors (no**

**argument, and two arguments) and a method to calculate Circumference.**

|  |
| --- |
| **package** task10;  **import** java.util.Scanner;  **public** **class** Circle {  **float** radius,pi;  **public** Circle() {  System.***out***.println("The apx Pi value is 3.142");  }  **public** Circle(**float** radius, **float** pi) {  **super**();  **this**.radius = radius;  **this**.pi = pi;  }  **public** **float** calculateCircumference() {    **return** 2\*pi\*radius;  }  **public** **static** **void** main(String args[]) {  Scanner scan =**new** Scanner(System.***in***);  Circle c=**new** Circle();  System.***out***.println("Enter the Radius of the circle:");  c=**new** Circle(scan.nextFloat(),3.142f);  System.***out***.println("Circumference of the circle is: "+c.calculateCircumference());  scan.close();  }  } |

**OUTPUT:**

The apx Pi value is 3.142

Enter the Radius of the circle:

7

Circumference of the circle is: 43.988

**4. Create a class Account class with balance as data member. Create two constructors (no argument, and two arguments) and methods to withdraw and deposit balance.**

|  |
| --- |
| **package** task10;  **import** java.util.Scanner;  **public** **class** Account {    **int** mainBalance,accNo;  String name;  **public** Account() {  mainBalance=0;  }    **public** Account(**int** minBalance, **int** accNo, String name) {  **super**();  **this**.mainBalance = minBalance;  **this**.accNo = accNo;  **this**.name = name;  }    **public** **void** withDraw(**int** amount) {  **if**(mainBalance<amount) {  System.***out***.println("The Main Balance is less then "+amount+" hence can't do the withdrawl");  }  **else** {  mainBalance-=amount;  System.***out***.println("The "+amount+" has been withdrawn remining balance is: "+mainBalance);  }  }  **public** **void** deposit(**int** amount) {  mainBalance+=amount;  System.***out***.println("The "+amount+" has been deposited in the account and the remining balance is:"+mainBalance);  }    @Override  **public** String toString() {  **return** "Account [mainBalance=" + mainBalance + ", accNo=" + accNo + ", name=" + name + "]";  }  **public** **static** **void** main(String[] args) {  **boolean** flag=**true**;  **int** choice,ac;  String name1;  Account acc=**new** Account();  Scanner scan =**new** Scanner(System.***in***);  System.***out***.println("Enter the Name:");  name1=scan.next();  System.***out***.println("Enter the account no:");  ac=scan.nextInt();  acc=**new** Account(15000,ac,name1);  **while**(flag) {  System.***out***.println("Enter 1 for view balance:\nEnter 2 for withdrawl:\nEnter 3 for Deposit:\nEnter 4 for exit:");  choice=scan.nextInt();  **switch**(choice) {  **case** 1:  System.***out***.println("The Main Balance is:"+acc.mainBalance);  **break**;  **case** 2:  System.***out***.println("Enter the amount to be withdrawl");  acc.withDraw(scan.nextInt());  **break**;  **case** 3:  System.***out***.println("Enter the amount to be Deposit");  acc.deposit(scan.nextInt());  **break**;  **case** 4:  System.***out***.println("Thank you for your servies");  System.***out***.println(acc.toString());  flag=**false**;  **break**;  **default**:  System.***out***.println("Please enter the correct value:");  **break**;  }  }  scan.close();  }  } |

**OUTPUT:**

Enter the Name:

Jai

Enter the account no:

9215

Enter 1 for view balance:

Enter 2 for withdrawl:

Enter 3 for Deposit:

Enter 4 for exit:

1

The Main Balance is:15000

Enter 1 for view balance:

Enter 2 for withdrawl:

Enter 3 for Deposit:

Enter 4 for exit:

2

Enter the amount to be withdrawl

5000

The 5000 has been withdrawn remining balance is: 10000

Enter 1 for view balance:

Enter 2 for withdrawl:

Enter 3 for Deposit:

Enter 4 for exit:

3

Enter the amount to be Deposit

2000

The 2000 has been deposited in the account and the remining balance is:12000

Enter 1 for view balance:

Enter 2 for withdrawl:

Enter 3 for Deposit:

Enter 4 for exit:

4

Thank you for your servies

Account [mainBalance=12000, accNo=9215, name=Jai]

**5. Create a Tea class in Java that includes the following methods:**

**a)prepareTea() - a method that prepares a basic tea with hot water and tea leaves.**

**b)addMilkO - a method that adds milk to the basic tea.**

**c)addSugarQ - a method that adds sugar to the basic tea.**

|  |
| --- |
| **package** task10;  **public** **class** Tea {    **public** **void** prepareTea() {  System.***out***.println("Prepared a basic tea with hot water and tea leaves");  }  **public** **void** addMilk() {  System.***out***.println("Add Milk to the Tea");  }  **public** **void** addSugar() {  System.***out***.println("Add Sugar to the Tea");  }  **public** **static** **void** main(String[] args) {  // Create an instance of the class  Tea tea = **new** Tea();  // Call the methods  tea.prepareTea();  tea.addMilk();  tea.addSugar();  }  } |

**OUTPUT:**

Prepared a basic tea with hot water and tea leaves

Add Milk to the Tea

Add Sugar to the Tea

**6. Create three subclasses of the Tea class: BlackTea, GreenTea, and HerbalTea Each subclass should override the prepareTeaQ) method to prepare the specific type of tea (black tea, green tea, or herbal tea) with appropriate ingredients and brewing times.**

|  |
| --- |
| **package** task10;  **public** **class** TeaClasses {  // Method to prepare basic tea  **public** **void** prepareBasicTea() {  System.***out***.println("Prepare basic tea with hot water and tea leaves.");  }  }  **class** BlackTea **extends** TeaClasses {  // Override method to prepare black tea  @Override  **public** **void** prepareBasicTea() {  System.***out***.println("Prepare black tea with hot water and black tea leaves.");  }  }  **class** GreenTea **extends** TeaClasses {  // Override method to prepare green tea  @Override  **public** **void** prepareBasicTea() {  System.***out***.println("Prepare green tea with hot water and green tea leaves.");  }  }  **class** HerbalTea **extends** TeaClasses {  // Override method to prepare herbal tea  @Override  **public** **void** prepareBasicTea() {  System.***out***.println("Prepare herbal tea with hot water and herbal tea leaves.");  }  } |

**OUTPUT:**

Prepare black tea with hot water and black tea leaves.

Prepare green tea with hot water and green tea leaves.

Prepare herbal tea with hot water and herbal tea leaves.

**7. Implement polymorphism in your program by creating an array of Tea objects that includes instances of the Tea class and its subclasses.**

|  |
| --- |
| **package** task10;  //Base class Tea  **class** Tea {  **public** **void** brew() {  System.***out***.println("Brewing tea");  }  }  //Subclass BlackTea  **class** BlackTea **extends** Tea {  @Override  **public** **void** brew() {  System.***out***.println("Brewing black tea");  }  }  //Subclass GreenTea  **class** GreenTea **extends** Tea {  @Override  **public** **void** brew() {  System.***out***.println("Brewing green tea");  }  }  **public** **class** TeaPoly {  **public** **static** **void** main(String[] args) {  // Create an array of Tea objects  Tea[] teas = **new** Tea[3];  // Populate the array with instances of Tea and its subclasses  teas[0] = **new** Tea(); // Tea object  teas[1] = **new** BlackTea(); // BlackTea object  teas[2] = **new** GreenTea(); // GreenTea object  // Brew each tea in the array using polymorphism  **for** (Tea tea : teas) {  tea.brew(); // Polymorphic method call  }  }  } |

**OUTPUT:**

Brewing tea

Brewing black tea

Brewing green tea