**1.**

**package** Tuesday;

**public** **final** **class** BillingService {

**private** **static** BillingService *instance*;

String iceCream;

**int** no,sum;

**private** BillingService(String iceCream,**int** no) {

// **TODO** Auto-generated constructor stub

**this**.iceCream=iceCream;

**this**.no=no;

}

**public** **static** BillingService getInstance(String icecream,**int** no) {

**if**(*instance*==(**null**)) {

*instance*=**new** BillingService(icecream,no);

}

**return** *instance*;

}

**public** **void** processPayment(BillingService paymentDetials) {

**if**(paymentDetials.iceCream=="CHOCOLATE") {

sum=30\*paymentDetials.no;

}**else** **if**(paymentDetials.iceCream=="VENELLA") {

sum=40\*paymentDetials.no;

}

}

**public** **void** generateInvoice(BillingService OrderDetails) {

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

System.***out***.println("The no of "+ OrderDetails.iceCream +" "+OrderDetails.no);

System.***out***.println("Total cost"+OrderDetails.no+" \*30 = "+OrderDetails.sum);

}

}

**package** Tuesday;

**public** **class** BillingServiceApp {

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

// **TODO** Auto-generated method stub

BillingService bs=BillingService.*getInstance*("CHOCOLATE",10);

bs.processPayment(bs);

bs.generateInvoice(bs);

}

}

**2.**

**package** Tuesday;

**interface** Vehicle {

**void** start();

**void** accelerate();

**void** brake();

}

**package** Tuesday;

**class** Car **implements** Vehicle {

@Override

**public** **void** start() {

System.***out***.println("car started");

}

@Override

**public** **void** accelerate() {

System.***out***.println("car accelerate");

}

@Override

**public** **void** brake() {

System.***out***.println("car brake");

}

}

**package** Tuesday;

**class** Motorcycle **implements** Vehicle {

@Override

**public** **void** start() {

System.***out***.println("Motorcycle start");

}

@Override

**public** **void** accelerate() {

// **TODO** Auto-generated method stub

System.***out***.println("Motorcycle accelerate");

}

@Override

**public** **void** brake() {

// **TODO** Auto-generated method stub

System.***out***.println("Motorcycle brake");

}

}

**package** Tuesday;

**class** Truck **implements** Vehicle {

@Override

**public** **void** start() {

// **TODO** Auto-generated method stub

System.***out***.println("Truck start");

}

@Override

**public** **void** accelerate() {

// **TODO** Auto-generated method stub

System.***out***.println("Truck accelerate");

}

@Override

**public** **void** brake() {

// **TODO** Auto-generated method stub

System.***out***.println("Truck brake");

}

}

**package** Tuesday;

**class** VehicleFactory {

**public** Vehicle createVehicle(String type) {

**if**(type==**null**) {

**return** **null**;

}

**if**(type.equalsIgnoreCase("Car")) {

**return** **new** Car();

} **else** **if**(type.equalsIgnoreCase("Motorcycle")){

**return** **new** Motorcycle();

} **else** **if**(type.equalsIgnoreCase("Truck")){

**return** **new** Truck();

}

**return** **null**;

}

}

**package** Tuesday;

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

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

VehicleFactory factory= **new** VehicleFactory ();

Vehicle car= factory.createVehicle("car");

Vehicle motorcycle= factory.createVehicle("motorcycle");

Vehicle truck = factory.createVehicle("truck");

car.start();

car.accelerate();

car.brake();

motorcycle.start();

motorcycle.accelerate();

motorcycle.brake();

truck.start();

truck.accelerate();

truck.brake();

}

}

**3.**

**package** Tuesday;

**public** **interface** Shape {

**void** draw ();

}

**package** Tuesday;

**public** **class** Cricle **implements** Shape {

@Override

**public** **void** draw() {

System.***out***.println("cricle is drawn");

}

}

**package** Tuesday;

**public** **class** Rectangle **implements** Shape {

@Override

**public** **void** draw() {

// **TODO** Auto-generated method stub

System.***out***.println("Rectangle is drawn");

}

}

**package** Tuesday;

**public** **class** Square **implements** Shape{

@Override

**public** **void** draw() {

// **TODO** Auto-generated method stub

System.***out***.println("Square is drawn");

}

}

**package** Tuesday;

**abstract** **class** AbstractFactory {

**abstract** Shape getShape(String shapeType);

}

**package** Tuesday;

**class** ShapeFactory **extends** AbstractFactory {

@Override

Shape getShape(String shapeType) {

// **TODO** Auto-generated method stub

**if**(shapeType==**null**) {

**return** **null**;

}

**if**(shapeType.equalsIgnoreCase("CIRCLE")) {

**return** **new** Cricle();

} **else** **if**(shapeType.equalsIgnoreCase("RECTANGLE")){

**return** **new** Rectangle();

} **else** **if**(shapeType.equalsIgnoreCase("SQUARE")){

**return** **new** Square();

}

**return** **null**;

}

}

**package** Tuesday;

**public** **class** AbstractFactoryPatternDemo {

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

AbstractFactory shapeFactory = **new** ShapeFactory();

Shape shape1 = shapeFactory.getShape("Circle");

shape1.draw();

Shape shape2= shapeFactory.getShape("Rectangle");

shape2.draw();

Shape shape3= shapeFactory.getShape("Square");

shape3.draw();

}

}

**4.**

**package** Tuesday;

**import** java.time.LocalDate;

**public** **final** **class** EmployeeClass {

**public** String getFirstname() {

**return** firstname;

}

**public** String getLastname() {

**return** lastname;

}

**public** LocalDate getDateOfBirth() {

**return** dateOfBirth;

}

**public** **int** getEmployeeId() {

**return** employeeId;

}

**public** LocalDate getJoiningDate() {

**return** joiningDate;

}

**public** **double** getSalary() {

**return** salary;

}

**private** **final** String firstname;

**private** **final** String lastname;

**private** **final** LocalDate dateOfBirth;

**private** **final** **int** employeeId ;

**private** **final** LocalDate joiningDate;

**private** **final** **double** salary;

**public** EmployeeClass(String firstname, String lastname, LocalDate dateOfBirth, **int** employeeId, LocalDate joiningDate,

**double** salary) {

**super**();

**this**.firstname = firstname;

**this**.lastname = lastname;

**this**.dateOfBirth = dateOfBirth;

**this**.employeeId = employeeId;

**this**.joiningDate = joiningDate;

**this**.salary = salary;

}

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

EmployeeClass emp=**new** EmployeeClass("pavan","kalyan",LocalDate.*of*(2001,12,12),101123,LocalDate.*of*(2021, 12, 06),30000.00);

System.***out***.println("the firstname is : "+emp.firstname);

System.***out***.println("the lastname is : "+emp.lastname);

System.***out***.println("the date of birth is : "+emp.getDateOfBirth());

System.***out***.println("the employee id is : "+emp.employeeId);

System.***out***.println("the joiningDate is : "+emp.getJoiningDate());

System.***out***.println("the salary is : "+emp.salary);

}

}