**//OOP Practical No.: 5**

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**Interface**

**Design and develop a context for given case study and implement an interface for Vehicles**

**Consider the example of vehicles like bicycle, car and bike. All Vehicles have common**

**functionalities such as Gear Change, Speed up and apply breaks. Make an interface and put all**

**these common functionalities. Bicycle, Bike, Car classes should be implemented for all these**

**functionalities in their own class in their own way**

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import java.util.Scanner;

interface Vehicle

{

void changeGear(int a);

void speedUp(int a);

void applyBrakes(int a);

}

class Bicycle implements Vehicle

{

int speed;

int gear;

Bicycle()

{

speed=10;

gear=1;

}

public void changeGear(int newGear)

{

gear=newGear;

System.out.println("Bicycle is now running on Gear " + gear);

}

public void speedUp(int increment)

{

System.out.println("Initially the Speed of Bicycle was " + speed + " km/hr.");

speed=speed+increment;

System.out.println("After increasing the Speed of Bicycle is " + speed + " km/hr.");

}

public void applyBrakes(int decrement)

{

System.out.println("Initially the Speed of Bicycle was " + speed + " km/hr.");

speed=speed-decrement;

System.out.println("After applying the BRAKES, the Speed of Bicycle is " + speed + " km/hr.");

}

public void display()

{

System.out.println("Current Speed is-> : " +speed+ " km/hr \nCurrent Gear is->: " +gear);

}

}

class Bike implements Vehicle

{

int speed;

int gear;

Bike()

{

speed=20;

gear=1;

}

public void changeGear(int newGear)

{

gear=newGear;

System.out.println("Bike is now running on Gear " + gear);

}

public void speedUp(int increment)

{

System.out.println("Initially the Speed of Bike was " + speed + " km/hr.");

speed=speed+increment;

System.out.println("After increasing the Speed of Bike is " + speed + " km/hr.");

}

public void applyBrakes(int decrement)

{

System.out.println("Initially the speed of Bike was " + speed + " km/hr.");

speed=speed-decrement;

System.out.println("After applying the BRAKES, the Speed of Bike is " + speed + " km/hr.");

}

public void display()

{

System.out.println("Current Speed is-> : " +speed+ " km/hr \nCurrent Gear is->: " +gear);

}

}

class Car implements Vehicle

{

int speed;

int gear;

Car()

{

speed=35;

gear=1;

}

public void changeGear(int newGear)

{

gear=newGear;

System.out.println("Car is now running on Gear " + gear);

}

public void speedUp(int increment)

{

System.out.println("Initially the Speed of Car was " + speed + " km/hr.");

speed=speed+increment;

System.out.println("After increasing the Speed of Car is " + speed + " km/hr.");

}

public void applyBrakes(int decrement)

{

System.out.println("Initially the Speed of CCar was " + speed + " km/hr.");

speed=speed-decrement;

System.out.println("After applying the BRAKES, the Speed of Car is " + speed + " km/hr.");

}

public void display()

{

System.out.println("Current Speed is-> : " +speed+ " km/hr \nCurrent Gear is->: " +gear);

}

}

public class Transport

{

public static void main(String args[])

{

Scanner sc = new Scanner(System.in);

System.out.println("\n Select Mode Of Transportation : \n\t\t\t\t-> (1).BICYCLE \n\t\t\t\t-> (2).BIKE \n\t\t\t\t-> (3).CAR ");

int ch=sc.nextInt();

Bicycle bicycle=new Bicycle();

Bike bike=new Bike();

Car car=new Car();

while(ch>0 && ch<4)

{

System.out.println("\n Choose Operation: \n\t-> 1. Change Gear \n\t-> 2. Increase Speed \n\t-> 3. Decrease Speed \n\t-> 4. Display Present State \n\t-> 5. Exit ");

int operationNo=sc.nextInt();

switch(operationNo)

{

case 1: System.out.println("Which Gear do you want to USE?");

int g=sc.nextInt();

if(ch==1)

bicycle.changeGear(g);

else if(ch==2)

bike.changeGear(g);

else

car.changeGear(g);

break;

case 2: System.out.println("By how many km/hr do you want to increase the speed?");

int incre=sc.nextInt();

if(ch==1)

bicycle.speedUp(incre);

else if(ch==2)

bike.speedUp(incre);

else

car.speedUp(incre);

break;

case 3: System.out.println("By how many km/hr do you want to decrease the Speed?");

int decre=sc.nextInt();

if(ch==1)

bicycle.applyBrakes(decre);

else if(ch==2)

bike.applyBrakes(decre);

else

car.applyBrakes(decre);

break;

case 4: if(ch==1)

bicycle.display();

else if(ch==2)

bike.display();

else

car.display();

break;

case 5: System.exit(0);

default: System.out.println("Enter valid choice.");

}

}

System.out.println("Invalid choice..!!");

}

}

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**OUTPUT**

Select Mode Of Transportation :

-> (1).BICYCLE

-> (2).BIKE

-> (3).CAR

1

Choose Operation:

-> 1. Change Gear

-> 2. Increase Speed

-> 3. Decrease Speed

-> 4. Display Present State

-> 5. Exit

4

Current Speed is-> : 10 km/hr

Current Gear is->: 1

Choose Operation:

-> 1. Change Gear

-> 2. Increase Speed

-> 3. Decrease Speed

-> 4. Display Present State

-> 5. Exit

1

Which Gear do you want to USE?

3

Bicycle is now running on Gear 3

Choose Operation:

-> 1. Change Gear

-> 2. Increase Speed

-> 3. Decrease Speed

-> 4. Display Present State

-> 5. Exit

2

By how many km/hr do you want to increase the speed?

30

Initially the Speed of Bicycle was 10 km/hr.

After increasing the Speed of Bicycle is 40 km/hr.

Choose Operation:

-> 1. Change Gear

-> 2. Increase Speed

-> 3. Decrease Speed

-> 4. Display Present State

-> 5. Exit

3

By how many km/hr do you want to decrease the speed?

5

Initially the Speed of Bicycle was 40 km/hr.

After applying the BRAKES, the Speed of Bicycle is 35 km/hr.

Choose Operation:

-> 1. Change Gear

-> 2. Increase Speed

-> 3. Decrease Speed

-> 4. Display Present State

-> 5. Exit

4

Current Speed is-> : 35 km/hr

Current Gear is->: 3

Choose Operation:

-> 1. Change Gear

-> 2. Increase Speed

-> 3. Decrease Speed

-> 4. Display Present State

-> 5. Exit

5

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