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**Roll no. :- 44**

**Practical no. :- 5 \*/**

**//Program**

**import java.util.Scanner;**

**interface Vehicle {**

**// methods are public and abstract by default**

**void changeGear(int a);**

**void speedUp(int a);**

**void applyBrakes(int a);**

**}**

**class Bicycle implements Vehicle {**

**// data members**

**int speed;**

**int gear;**

**// constructor**

**Bicycle()**

**{   speed = 10;**

**gear = 1;}**

**// all the abstract methods of Vehicle interface will are implemented in Bicycle class**

**public void changeGear(int newGear){// to change gear**

**gear = newGear;**

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

**public void speedUp(int increment){// to increase speed**

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

**speed = speed + increment;**

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

**}**

**public void applyBrakes(int decrement) // to decrease speed**

**{   System.out.println("Initially speed of bicycle was " + speed + " km/hr.");**

**speed = speed - decrement;**

**System.out.println("After applying brakes speed of Bicycle is " + speed + " km/hr.");**

**}**

**public void display(){**

**System.out.println("Speed: " + speed + " km/hr. \nGear: " + gear);**

**}**

**}**

**class Bike implements Vehicle {**

**int speed;**

**int gear;**

**// all the abstract methods of Vehicle interface will are implemented in Bike clas**

**Bike(){// constructor**

**speed = 20;**

**gear = 1;   }**

**// to change gear**

**public void changeGear(int newGear){**

**gear = newGear;**

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

**}**

**public void speedUp(int increment){ // to increase speed**

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

**speed = speed + increment;**

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

**}**

**public void applyBrakes(int decrement){ // to decrease speed**

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

**speed = speed - decrement;**

**System.out.println("After applying brakes speed of Bike is " + speed + " km/hr.");**

**}**

**public void display(){  //display**

**System.out.println("Speed: " + speed + " km/hr. \nGear: " + gear);**

**}**

**}**

**class Car implements Vehicle{**

**int speed;**

**int gear;**

**Car(){  // constructor**

**speed = 20;**

**gear = 1;**

**}**

**// all the abstract methods of Vehicle interface will are implemented in Car class**

**// to change gear**

**public void changeGear(int newGear){**

**gear = newGear;**

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

**}**

**// to increase speed**

**public void speedUp(int increment){**

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

**speed = speed + increment;**

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

**}**

**// to decrease speed**

**public void applyBrakes(int decrement){**

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

**speed = speed - decrement;**

**System.out.println("After applying brakes speed of Car is " + speed + " km/hr.");**

**}**

**public void display(){**

**System.out.println("Speed: " + speed + " km/hr. \nGear: " + gear);**

**}**

**}**

**public class Transport12 {**

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

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

**System.out.println("\nSelect the mode of transportation: \n\t 1. Bicycle\n\t 2. Bike\n\t 3. Car");**

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

**Bicycle bicycle = new Bicycle(); // instance of Bicycle Class**

**Bike bike = new Bike(); // instance of Bike Class**

**Car car = new Car(); // instance of Car Class**

**while (ch > 0 && ch < 4){**

**System.out.println(**

**"\nChoose operation: \n\t 1. Change Gear\n\t 2. Increase Speed\n\t 3. Decrease Speed\n\t4. Display present state\n\t5. 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 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 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");**

**}//end of switch**

**}//end of while**

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

**}// end of main method**

**}**

**OUTPUT**

Select the 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

1

Which gear do you want to use?

2

Bicycle is now running on gear 2

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 speed?

10

Initially speed of bicycle was 10 km/hr.

After increasing speed of Bicycle is 20 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 speed?

6

Initially speed of bicycle was 20 km/hr.

After applying brakes speed of Bicycle is 14 km/hr.

Choose operation:

1. Change Gear

2. Increase Speed

4. Display present state

5. Exit

4

Speed: 14 km/hr.

Gear: 2

Choose operation:

1. Change Gear

2. Increase Speed

3. Decrease Speed

4. Display present state

5. Exit

5

PS C:\Users\Dell> java Transport12.java

Select the mode of transportation:

1. Bicycle

2. Bike

3. Car

3

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

Car 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 speed?

30

Initially speed of car was 20 km/hr.

After increasing Speed of car is 50 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 speed?

12

Initially speed of car was 50 km/hr.

After applying brakes speed of Car is 38 km/hr.

Choose operation:

1. Change Gear

2. Increase Speed

3. Decrease Speed

4. Display present state

5. Exit

4

Speed: 38 km/hr.

Gear: 3

Choose operation:

1. Change Gear

2. Increase Speed

3. Decrease Speed

4. Display present state

5. Exit

5