

OOP LAB

ASSIGNMENT-5: INTERFACE

- Code: -

```
/*
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Div:- SE10
Batch:- F10
Roll.No :- 23241
Assignment :- 5
*/

//importing java scanner package
import java.util.Scanner;

//interface vehicle
interface vehicle{
    void changegear(int speed_ch); //function to
change gear
    void speedup(int speed_ch); //function to
increase speed
    void applybrakes(int speed_ch); //function to
decrease speed
    void display(); //function to display current
speed and gear
}

//class bicycle implementing the interface
vehicle
class bicycle implements vehicle{
```

```
    private int speed,gear; //private data
members speed and gear
    bicycle(){ //bicycle class constructor to
initialise speed
        speed=0;
        gear=0;
    }

    public void display(){ //defining the
function display from interface vehicle
        System.out.println("The current speed
is=>"+speed+" Km/Hr"); //printing the current
        System.out.println("The current gear
is=>"+gear); //printing the current gear
    }

    public void changegear(int gear_ch){
//defining the function changegear from interface
vehicle
        if(gear_ch==1){ //if gear changing to
one
            if(speed>0 && speed<=10) //validating
the speed according to the gear
            {
                gear=1; //if speed is within the
range of gear then changing the gear
            }
            else
            {
```

```
        //if speed is not within the gear
range then informing the user to maintian speed
in given gear range
```

```
        System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 0-10");
```

```
    }
}
```

```
    if(gear_ch==2){ //if gear changing to two
        if(speed>10 && speed<=20)
//validating the speed according to the gear
```

```
    {
        gear=2; //if speed is within the
range of gear then changing the gear
```

```
    }
    else
    {
```

```
        //if speed is not within the gear
range then informing the user to maintian speed
in given gear range
```

```
        System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 10-20");
```

```
    }
}
```

```
    if(gear_ch==3){ //if gear changing to
three
```

```
        if(speed>20 && speed<=30)
        {
```

```
        gear=3;//if speed is within the
range of gear then changing the gear
    }
    else
    {
        //if speed is not within the gear
range then informing the user to maintian speed
in given gear range
        System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 20-30");
    }
}

if(gear_ch==4){
    if(speed>30 && speed<=40)
    {
        gear=4;//if speed is within the
range of gear then changing the gear
    }
    else
    {
        //if speed is not within the gear
range then informing the user to maintian speed
in given gear range
        System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 30-40");
    }
}
```

```

    }

    public void speedup(int speed_ch){ //defining
speedup function from interface vehicle
        speed=speed+speed_ch; //increasing the
speed as given by the user
    }

    public void applybrakes(int speed_ch){
//defining applybrakes function from interface
vehicle
        speed=speed-speed_ch; //decreasing the
spede as given by the user
    }
}

//class bike implementing the interface vehicle
class bike implements vehicle{
    private int speed,gear; //private variable
speed and gear
    bike(){ //constructor of class bike
        speed=0;
        gear=0;
    }

    public void display(){ //defining the
function display from interface vehicle
        System.out.println("The current speed
is=>" + speed + " Km/Hr"); //printing the current
        System.out.println("The current gear
is=>" + gear); //printing the current gear

```

```

    }

    public void changegear(int gear_ch){
//defining the function changegear from interface
vehicle
        if(gear_ch==1){
            if(speed>0 && speed<=15) //validating
the speed according to the gear
            {
                gear=1;//changing gear if within
speed limit
            }
            else
            {
                //pompting the user to maintain
speed within range
                System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 0-15");
            }
        }

        if(gear_ch==2){
            if(speed>15 && speed<=25)//validating
the speed according to the gear
            {
                gear=2;//changing gear if within
speed limit
            }
            else
            {

```

```

        //pompting the user to maintain
speed within range
        System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 15-25");
    }
}

    if(gear_ch==3){
        if(speed>25 && speed<=35)//validating
the speed according to the gear
        {
            gear=3;//changing gear if within
speed limit
        }
        else
        {
            //pompting the user to maintain
speed within range
            System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 25-35");
        }
    }

    if(gear_ch==4){
        if(speed>35 && speed<=50)//validating
the speed according to the gear
        {
            gear=4;//changing gear if within
speed limit

```

```

        }
        else
        {
            //prompting the user to maintain
speed within range
            System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 35-50");
        }
    }

    if(gear_ch==5){ //if gear change to 5
        if(speed>50) //validating speed limit
of gear
        {
            gear=5; //changing gear if within
speed limit
        }
        else
        {
            //prompting the user to maintain
speed within range
            System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
above 50");
        }
    }
}
}

```



```

        public void speedup(int speed_ch){ //defining
speedup function from interface vehicle
            speed=speed+speed_ch; //increasing the
speed as given by the user
        }

        public void applybrakes(int speed_ch){
//defining applybrakes function from interface
vehicle
            speed=speed-speed_ch; //decreasing the
spede as given by the user
        }
    }

class car implements vehicle{
    private int speed,gear;
    car(){ //constructor of class car
        speed=0;
        gear=0;
    }

    public void display(){ //displaying current
gear and speed
        System.out.println("The current speed
is=>"+speed+" Km/Hr.");
        System.out.println("The current gear
is=>"+gear);
    }

    public void changegear(int gear_ch){
        if(gear_ch==1){

```

```

        if(speed>0 && speed<=20)//validating
the speed according to the gear
        {
            gear=1;//changing gear if within
speed limit
        }
        else
        {
            //pompting the user to maintain
speed within range
            System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 0-20");
        }
    }

    if(gear_ch==2){
        if(speed>20 && speed<=35)//validating
the speed according to the gear
        {
            gear=2;//changing gear if within
speed limit
        }
        else
        {
            //pompting the user to maintain
speed within range
            System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 20-35");
        }
    }

```

```

    }

    if(gear_ch==3){
        if(speed>35 && speed<=50)//validating
the speed according to the gear
        {
            gear=3;//changing gear if within
speed limit
        }
        else
        {
            //pompting the user to maintain
speed within range
            System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 35-50");
        }
    }

    if(gear_ch==4){
        if(speed>50 && speed<=70)//validating
the speed according to the gear
        {
            gear=4;//changing gear if within
speed limit
        }
        else
        {
            //pompting the user to maintain
speed within range

```

```

        System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
between 50-70");
    }
}

    if(gear_ch==5){
        if(speed>70)//validating the speed
according to the gear
        {
            gear=5;//changing gear if within
speed limit
        }
        else
        {
            //pompting the user to maintain
speed within range
            System.out.println("Your current
speed is "+speed+" Km/Hr. Please maintain speed
above 70");
        }
    }

}

    public void speedup(int speed_ch){ //defining
speedup funtion of interfrace vehicle
        speed=speed+speed_ch; //increasing the
speed
    }
}

```

```

        public void applybrakes(int speed_ch){
//defining applybrakes funtion of interface
vehicle
        speed=speed-speed_ch; //decreasing the
speed
        }
}

public class interface_gear{
    public static void main(String[] args) {
        int choice_vehicle,speed_ch,gear_ch;
//variables to accept change of speed and gear
and choice of vehicle from user
        int choice_operation; //variable to accep
choice of operation
        Scanner sc=new Scanner(System.in);
//scanner sc to take inputs

        do{

System.out.println("~~~~~
~~~~~");
            System.out.println("What do you want
to take out for a ride today?\n1.Schnell
Bicycle\n2.Thunderbird 350\n3.Honda
City\n4.Quit");
            choice_vehicle=sc.nextInt();
//accepting choice of vehicle from user
            switch(choice_vehicle){ //switch case
for choice of vehicle
                case 1:

```

```

        vehicle v1=new bicycle();
//creating an object
        do{

System.out.println("~~~~~
~~~~~");
        System.out.println("Enter the
action to be performed\n1.Accelerate\n2.Change
Gear\n3.Apply brake\n4.Display Current Speed and
gear\n5.Quit");
        choice_operation=sc.nextInt();
//accepting choice of operation
        switch(choice_operation) //switch
case for choice of operation
        {
            case 1:
                System.out.println("How much
speed you want to increase?");
                speed_ch=sc.nextInt();
//accepting increase speed from user
                v1.speedup(speed_ch);
//passing speed to be increased to speedup
function

                break;

            case 2:
                System.out.println("Enter the
gear you want to change to=>");
                gear_ch=sc.nextInt();
//accepting gear change from user

```

```

        v1.changeGear(gear_ch);
//passing changed gear to function
        break;

        case 3:
            System.out.println("How much
speed you want to decrease?");
            speed_ch=sc.nextInt();
//accepting how much speed to decrease from user
            v1.applyBrakes(speed_ch);
//passing decreased speed to function applyBrakes
            break;

        case 4:
            v1.display(); //displaying
current speed and gear
            break;

        case 5:
            System.out.println("Ignition
off"); //ignition off
            break;

        default:
            System.out.println("Enter
valid operation"); //default case for invalid
operation
    }
}while(choice_operation!=5);
break;

```

```

        case 2:
            vehicle v2=new bike(); //creating
object
            do{

System.out.println("~~~~~
~~~~~");
                System.out.println("Enter the
action to be performed\n1.Accelerate\n2.Change
Gear\n3.Apply brake\n4.Display Current Speed and
gear\n5.Quit");
                choice_operation=sc.nextInt();
//taking input for choice of operation
                switch(choice_operation) //switch
case for choice of operation
                {
                    case 1:
                        System.out.println("How much
speed you want to increase?");
                        speed_ch=sc.nextInt();
//accepting speed to increased from user
                        v2.speedup(speed_ch);
//passing the increased speed to speedup function
                        break;

                    case 2:
                        System.out.println("Enter the
gear you want to change to=>");
                        gear_ch=sc.nextInt();
//accepting gear change from user

```



```

        v2.changegear(gear_ch);
//passing gear to be changed from user to
changegear function
        break;

        case 3:
            System.out.println("How much
speed you want to decrease?");
            speed_ch=sc.nextInt();
//accepting speed to be decreased from user
            v2.applybrakes(speed_ch);
//passsing the speed to be decreased to
applybrakes function
            break;

        case 4:
            v2.display(); //displaying
current gear and speed
            break;

        case 5:
            System.out.println("Ignition
off");

            break;

        default:
            System.out.println("Enter
valid operation"); //default case for invalid
operation choice
    }
}while(choice_operation!=5);

```



```
        System.out.println("Enter the
gear you want to change to=>");
        gear_ch=sc.nextInt();
//accepting gear change from user
        v3.changegear(gear_ch);
//passing gear to be changed from user to
change gear function
        break;

        case 3:
            System.out.println("How much
speed you want to decrease?");

speed_ch=sc.nextInt();//accepting speed to be
decreased from user
            v3.applybrakes(speed_ch);
//passing the speed to be decreased to
applybrakes function
            break;

        case 4:
            v3.display();//displaying
current gear and speed
            break;

        case 5:
            System.out.println("Ignition
off");

            break;

        default:
```

```
                System.out.println("Enter  
valid operation"); //default case for invalid  
operation choice  
            }  
        }while(choice_operation!=5);  
        break;  
  
        case 4:  
            System.out.println("Exiting the  
program"); break;  
  
        default:  
            System.out.println("Enter valid  
choice"); break;  
    }  
  
    }while(choice_vehicle!=4);  
}  
}
```

FileEditSelectionViewGoRunTerminalHelp

interface_gear.java - mock test - Visual Studio Code

PROBLEMS1OUTPUTDEBUG CONSOLETERMINAL

What do you want to take out for a ride today?
1.Schnell Bicycle
2.Thunderbird 350
3.Honda City
4.Quit
1
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
1
How much speed you want to increase?
8
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
2
Enter the gear you want to change to=>
1
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
4
The current speed is=>8 Km/Hr
The current gear is=>1
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
1
How much speed you want to increase?
6
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake

powers...
Code

Ln 6, Col 16Spaces: 4UTF-8CRLFJavaGo LiveJavaSE-16Prettier

FileEditSelectionViewGoRunTerminalHelp

interface_gear.java - mock test - Visual Studio Code

PROBLEMS1OUTPUTDEBUG CONSOLETERMINAL

6

Enter the action to be performed

1.Accelerate

2.Change Gear

3.Apply brake

4.Display Current Speed and gear

5.Quit

2

Enter the gear you want to change to=>

3

Your current speed is 14 Km/Hr. Please maintain speed between 20-30

Enter the action to be performed

1.Accelerate

2.Change Gear

3.Apply brake

4.Display Current Speed and gear

5.Quit

1

How much speed you want to increase?

8

Enter the action to be performed

1.Accelerate

2.Change Gear

3.Apply brake

4.Display Current Speed and gear

5.Quit

2

Enter the gear you want to change to=>

3

Enter the action to be performed

1.Accelerate

2.Change Gear

3.Apply brake

4.Display Current Speed and gear

5.Quit

4

The current speed is=>22 Km/Hr

The current gear is=>3

Enter the action to be performed

1.Accelerate

2.Change Gear

3.Apply brake

4.Display Current Speed and gear

5.Quit

3

How much speed you want to decrease?

5

powers...

Code

01

Atharva

Live Share

Ln 6, Col 16

Spaces: 4

UTF-8

CRLF

Java

Go Live

JavaSE-16

Prettier

File Edit Selection View Go Run Terminal Help

interface_gear.java - mock test - Visual Studio Code

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL

Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
2
Enter the gear you want to change to=>
2
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
4
The current speed is=>17 Km/Hr
The current gear is=>2
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
5
Ignition off
What do you want to take out for a ride today?
1.Schnell Bicycle
2.Thunderbird 350
3.Honda City
4.Quit
2
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
1
How much speed you want to increase?
10
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear

powers...
Code

Ln 6, Col 16 Spaces: 4 UTF-8 CRLF Java Go Live JavaSE-16 Prettier

File Edit Selection View Go Run Terminal Help

interface_gear.java - mock test - Visual Studio Code

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL

5.Quit
2
Enter the gear you want to change to=>
1
~~~~~  
Enter the action to be performed  
1.Accelerate  
2.Change Gear  
3.Apply brake  
4.Display Current Speed and gear  
5.Quit  
4  
The current speed is=>10 Km/Hr  
The current gear is=>1  
~~~~~  
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
1
How much speed you want to increase?
20
~~~~~  
Enter the action to be performed  
1.Accelerate  
2.Change Gear  
3.Apply brake  
4.Display Current Speed and gear  
5.Quit  
2  
Enter the gear you want to change to=>  
3  
~~~~~  
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit

4
The current speed is=>30 Km/Hr
The current gear is=>3
~~~~~  
Enter the action to be performed  
1.Accelerate  
2.Change Gear  
3.Apply brake  
4.Display Current Speed and gear  
5.Quit

powers...

Code

0 1 Atharva Live Share

Ln 6, Col 16 Spaces: 4 UTF-8 CRLF Java Go Live JavaSE-16 Prettier





FileEditSelectionViewGoRunTerminalHelp

interface\_gear.java - mock test - Visual Studio Code

PROBLEMS1OUTPUTDEBUG CONSOLETERMINAL

Enter the action to be performed  
1.Accelerate  
2.Change Gear  
3.Apply brake  
4.Display Current Speed and gear  
5.Quit  
4  
The current speed is=>5 Km/Hr  
The current gear is=>1  
~~~~~  
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
5
Ignition off
~~~~~  
What do you want to take out for a ride today?  
1.Schnell Bicycle  
2.Thunderbird 350  
3.Honda City  
4.Quit  
3  
~~~~~  
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
1
How much speed you want to increase?
12
~~~~~  
Enter the action to be performed  
1.Accelerate  
2.Change Gear  
3.Apply brake  
4.Display Current Speed and gear  
5.Quit  
2  
Enter the gear you want to change to=>  
1  
~~~~~  
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit

powers...

Code

01AtharvaLive Share

Ln 6, Col 16Spaces: 4UTF-8CRLFJavaGo LiveJavaSE-16Prettier

File Edit Selection View Go Run Terminal Help

interface_gear.java - mock test - Visual Studio Code

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL

Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
4
The current speed is=>12 Km/Hr.
The current gear is=>1
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
1
How much speed you want to increase?
20
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
2
Enter the gear you want to change to=>
3
Your current speed is 32 Km/Hr. Please maintain speed between 35-50
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
1
How much speed you want to increase?
10
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
2
Enter the gear you want to change to=>
3

powers...
Code

0 1 Atharva Live Share Ln 6, Col 16 Spaces: 4 UTF-8 CRLF Java Go Live JavaSE-16 Prettier

FileEditSelectionViewGoRunTerminalHelp

interface_gear.java - mock test - Visual Studio Code

PROBLEMS1OUTPUTDEBUG CONSOLETERMINAL

5.Quit
3
How much speed you want to decrease?
20
~~~~~  
Enter the action to be performed  
1.Accelerate  
2.Change Gear  
3.Apply brake  
4.Display Current Speed and gear  
5.Quit  
3  
How much speed you want to decrease?  
5  
~~~~~  
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
2
Enter the gear you want to change to=>
1
~~~~~  
Enter the action to be performed  
1.Accelerate  
2.Change Gear  
3.Apply brake  
4.Display Current Speed and gear  
5.Quit  
4  
The current speed is=>17 Km/Hr.  
The current gear is=>1  
~~~~~  
Enter the action to be performed
1.Accelerate
2.Change Gear
3.Apply brake
4.Display Current Speed and gear
5.Quit
5
Ignition off
~~~~~  
What do you want to take out for a ride today?  
1.Schnell Bicycle  
2.Thunderbird 350  
3.Honda City  
4.Quit  
4  
Exiting the program  
PS C:\Users\kinikar\Desktop\P.I.C.T\SEM 3\OOP LAB\Assignments\mock test>

+ - - X

powers...

Code

0 1

Atharva

Live Share

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