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intenfore Vehicle!

my thought supplied to some water to

1) They are useful when multiple ware bala t

the When to use intenface and when to use abstract class? Develop a story and white codes.

Stony Introduction; Atif, a computer science undergraduate is passionate about vehicles and programming. He decides to simulate a real-world can using Object-Oriented Programming (OOP) concepts in Java. His goal is to create a realistic vehicle system that can be extended later for other classes.

Design Approach and OOP Concept Used.

1) Vehicle Intenface - Defines Behaviour: Attf
Stants by creating a vehicle intenface. He
knows that

1) Intenfaces define contracts, not implementation

classes need to follow the same behaviour.

Code

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intenface vehicle (

rold start Endire ();

rold start Endire ();

rold start Endire ();

void increment ();

void decrement () inoth subordat Brooks

12) Thansport Abstract class - Shared Bluepaint

AHF defines an abistract class Transport, that

acts as a base for all triansport types: It:

CS CamScanner

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i) Contains common fields like engine Capacity and 11) wood book townload silding wheels. ii) Has a construction to initialize the values iii) Implements a method show Details iv) Has an abstract method honk () to be defined by subclasses on end orders ablindented code abstract class Transport { protected int engine Capacity; protected int wheels; on pol soon public Transport (int engine Capacity int whoels) { this engine Capacity = engine Capacity; this wheels = wheels ; 3 () gots bior sildug public void showDetalls () { adoldops si suibus .,) ulturid tro watsks System.out.printin (" Engine Capacity: "+ engine Capacity + "co"); System.outprintln ("Number of wheels:"+

wheels

The paralle so man and a place of the contract and contract (public abstract void honk (): the woods weton to inthe little 3 3) Engine class- Has-A Relationship (Composition): Attfrebuilds a simple Engine class to es simulate engine behaviour. He then include this in the Can class. 3 transport stars front do protected intendine Capacity class Engine () leader to be belong public vold stant () { magazint ilder System.out.println ("Engine is stanting ... "); this wheels a wheels. 7 public void stop () { (a) elistado ede blovallados System.out.printin (" Engine is stopping. -"); System and printed (Espaine Copberly modern in ") altering the motor

4) Can Class - Is- A Transport and Is- A Vehicle: Atif designs the Canclass by i) Extending Transport ii) Implementing Vehicle iii) Having an Engline object. Code: class Can extends, Transport implements Vehicle { private Engine engine private int speed; public Can (int engine Capacity, int wheels) { super (engine Capacity, wheels); this engine = new Engine (); this speed=0; : (ayland; + pood public void stant Engine () { engine. stant (), wood blow silder System.out.primtln ("Can engine stanted."); 1 9000

```
public void stop Engine () { - a al - a along
     engine. stop (): 2010 not out any sob THA
     System.out-printin ("Can engine stopped.");
                    ii) Implementing vehicle
 3
 public void increment () () End no Bull line
     speed=speed +10;
     Systemioutiphinting " speed increased to: "
               + speed to skind historing
                      private int speeds
public con (int 3 () tramanab bion silduq
      Speed = speed -10; speed ) mages
       System out println ("Speed decreased to: "+
                        this speed= 0;
                    Spred + "km/h");
            public void stand Engine () ?
   public void honk. Clande salpas
  Systemiout printing ("Can says - Beep
                               Beep! "):
     ( C.bolnote
```

public void show Speed () {

Systemiout printin ("Current speed:"+

speed + "km/h");

3

3

5) Main class - Testing and Gambage Collection:

In Main class, Alif:

i) Creates a Can object: Jultaling two makes

- ii) Tests engine stant/stop, speed control, honking.
- iii) Deneferences object by setting it to null.
- iv) Requests gambage collection using System ger ():

Code!

public class Main {

publice todic void main (String [] ange) (

Thread sleep (1000)

Can can 1 = new Can (2000-4);

can 1. stant Engine ();

cand show Details ()

cant. increment() i() bong words biowsilling cand increment(); can 1 . show speed () can1. honk(); can1. decremen+(); can1 show Speed (); Candistop Engine () boo podes T- 220h moin (3 In Main class = AHF: can1=null System out printing "Requesting garbage collection. inologo speed control hook ii) Dene lenences object by setting it to avil. Sastem d c (); in prancets garbage collection us 4my { Thread sleep (1000) Public class Main ? 3) Libration proposed Exeption e) Elding ephlat Stack Trace () can 1. stant Engine (); System out-printing ("End of Main Method");