

1 objects :-

1. car :-

definition of object :-

object is something which has state, behaviour, identity & responsibility.

state :- state is values given to attributes.

attribute + value = state.

Behaviour :- Response given to the outside world

identity :- uniqueness of an object

responsibility :- roll of an object.

state :- color, speed, fuel level, model, brand.

behaviour :- start, stop, accelerate

identity :- vehicle number

responsibility :- transport people.

2. student :-

Object :-

object is something which has state, behaviour, identity & responsibility

state :- value given to the attribute.

$$\text{attribute} + \text{value} = \text{state}$$

identity :- uniqueness of an object

behaviour :- Response given to outside world.

responsibility :- roll of an object

state :- Name, roll number, class

behaviour :- study, submit assignments

identity :- unique roll number

responsibility : complete academic tasks.

3. water bottle :-

object :- object is something which has state, behaviour, identity & responsibility

state :- value given to the attribute.

behaviour: Response given to outside world.

identity : uniqueness of an object

responsibility : roll of an object

state :- capacity , quantity of water, color

behaviour : open, close, store water

identity : Brand / type.

responsibility : Hold & supply water.

4. fan :-

object :- object is something which has state, behaviour identity & responsibility.

state : value given to the attribute

behaviour : Response given to outside world.

identity : uniqueness of an object

responsibility : roll of an object

state : power state , speed level

behaviour : Rotate, change speed

identity : model number

responsibility : provide air circulation.

5. Bank account :-

object :- object is something which has state, behaviour identity & responsibility.

state :- values given to attribute

behaviour :- response given to outside world

identity : uniqueness of an object

responsibility : roll of an object

state :- balance, account type

behaviour:- deposit, withdraw, transfer.

identity :- account number

responsibility : manage customer's money.

6. Book :

object :- object is something which has state, behaviour identity & responsibility

state :- values given to attribute

behaviour: response given to

outside world

identity : uniqueness of an object

Responsibility : roll of an object.

state : title , author, no. of pages

behaviour: open, close, provide information

identity : ISBN number

responsibility: store & share knowledge

7. washing machine :-

object :- object is something which has state, behaviour, identity & responsibility.

state : values given to attributes

behaviour: response given to outside world

identity : uniqueness of an object

Responsibility : roll of an object.

state : wash mode, water level, load weight

behaviour: wash, rinse, spin

identity : model / serial number
responsibility : clean clothes

8. Printer :-

object : something which has state, behaviour, identity & responsibility

state : values given to attributes

behaviour :- Response given to outside world.

identity : uniqueness of an object

responsibility : roll of an object

state :- Ink level, paper count, print queue.

behaviour: print, scan, copy

identity : serial number

responsibility: produce printed output.

9. Bus:

object : something which has state, behaviour, identity & responsibility.

state : values given to attributes

behaviour : response given to outside world.

identity : uniqueness of an object

responsibility : roll of an object.

State : Route number, passenger capacity, bus number.

Behaviour : move, stop, pick up passengers.

identity : Bus number.

responsibility : public transportation

10' clock :

object :- object is something which has state, behaviour, identity & responsibility.

state : values given to attributes

behaviour : response given to outside world

identity : uniqueness of an object

responsibility : roll of an object.

state :- time, battery status,
no. of cells.

behaviour: tick, shock time, alarm

identity : clock model / design

~~denoting: claim
responsibility: display time~~

3 | Encapsulation

Definition :-

- encapsulation means binding & hiding the states & behaviour
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examples :-

1. bank account :

account number & balance is private, withdraw & deposit methods are public.

2. car

you start a car with a key / button. complex engine functions are hidden.

3. school management system.

private :- studentlist, stafflist

public :- add student, remove student.

4. Elevator system :

you press the floor button internal motor control & safety logic are hidden.

5. mobile phone :

private : battery level , password
public : unlock , charge , check
battery this are bad public
methods.

6. Game character

private :- health , power
public : attack , heal , get health

7. social media account

private :- password , private
messages .

public : send message , login ,
logout .

8. library book .

private : bookid , issued status
public : returnbook , check
status .

9. Employee salary system

private : salary , bonus

public : calculate salary , get salary

10. ticket booking

private : seat Availability , pnr Number
public : book seat , cancel seat

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Inheritance :-

definition :-

it is the way of reusing already defined class with is a relationship

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Examples :-

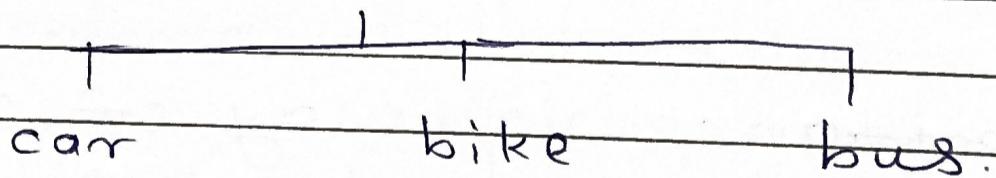
1. Electronics (derived base class).

mobile, laptop & television are derived classes.

2. payment (base class)

credit card payment, UPI payment & cash payment are derived from base class payment

3. vehicle



4. Appliance is a base class & washing machine, Refrigerator, microwave are derived classes

5 Account is base class
saving account, current account, salary account are derived classes

6. Ticket is base class.

train ticket, movie ticket & flight ticket are derived from base class ticket.

7. Event



8. person is base class & student & teacher are derived classes.

9. Book is base class:

Novel, Textbook & magazine are derived classes.

10. shape is base class.

circle, rectangle, triangle are derived classes.

Q) Polymorphism:-

Definition:- same behaviour but different implementation
same message given to generalize things for same behaviour but implemented differently.

same message given to generalize
things for same behaviour
but implemented differently

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same message given to generalize things for same behaviour but implemented differently

Examples :-

1. payment :- credit card, debit card, UPF

method :- pay

method is same but they implement differently.

2. Employee - manager, developer

method : calculate bonus

• manager - 20% of salary

• developer - 10% of salary

3. shape - circle, rectangle, triangle

method - calculate area

• circle - πr^2

• rectangle - length \times breadth

• triangle - $\frac{1}{2} \times \text{base} \times \text{height}$

4. printer - (inkjet, laser)

method - print document

• Inkjet - uses liquid ink

• laser - uses toner powder

5. file - PDF file, word file

method - open()

PDF - opens in PDF reader

word - opens in word processor.

6. Defense - Army, navy
method - Attack
method is same but they
implement differently.

7. saving data.

method:- save.

save to database, save to file
save to cloud.

8. Employee - developer, tester.

method - work

developer & tester has
different implementation.

9. insurance claim - Health insurance,
car insurance, travel insurance
same method - process claim.

10. Booking Appointment

doctor, salon, gym session
same method - book.

2 Abstraction :-

definition :-

- selective ignorance
- abstraction means selective ignorance.
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- abstraction means selective ignorance.

Examples of Abstraction :-

i) person details :-

in person details different organizations would selectively ignore certain attributes based on their need like in hospital there is no need of person's education or salary so they

ignore that things

- ii] in car you ignore the engine mechanism & only focus on selective part like steering wheel.
- iii] microwave oven :- you press start. you don't need to know how microwaves heat food so you ignore that
- iv] Google maps.
you see directions . you don't need → see GPS, satellite calculations.
- v ATM machine :- you see options like withdraw, balance, transfer
you ignore how it actually works internally
- vi Elevator: you press the floor button . you ignore → motor, pulley & cable mechanism
- vii mobile phone :-
you tap call, message, camera
you don't see → processor or logic
or signal routing.

viii)

fan Regulator :-

you increase speed . you don't see voltage variation.

ix)

Ac temperature control :

you just set the temperature
you ignore how it actually
works internally

x)

water purifier:

you open tap & clean water
comes out . you don't see
how it filter