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Q.1] Differentiate between i) Association vs Aggregation

Association	Aggregation
1) Association is relationship between two classes where one class use another	1) Aggregation describes special type of association which specifies a whole & part relationship
2) It is represented by "has a" relationship.	2) It is represented by "has a" + "whole part" relationship.
3) It is inflexible in nature	3) It is flexible in nature.
4) A single line segment between components.	4) A hollow diamond adjacent to assembly class.
5) objects are linked with each other	5) Linked objects are not dependent upon other object.

ii) Aggregation vs generalization

Aggregation	generalization
1) Aggregation is an association which specifies a whole and part relationship.	1) Generalization is mechanism for combining similar class of objects into single class.

ii) It denotes "has a" + "whole part relationship

iii) It is represented as diamond symbol.

iv) Aggregation relates instances.

ii) It denotes "is a" relationship.

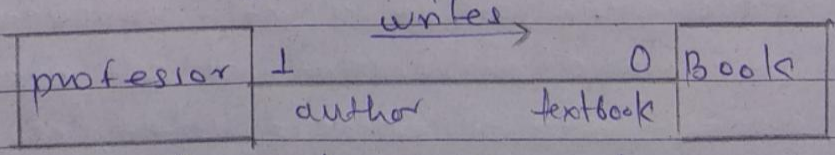
iii) It is represented as arrow symbol.

v) generalization relates classes.

Q-2] Explain following terms:

(1) Role name - A role name explains how an object participates in relationship. Each object needs to hold a reference to associated object or objects. The reference is held in an attribute within object. When there is only one association then there is only one attribute holding a reference. Role names often appears as nouns in problem description. Use of role name is optional.

eng- professor & book are associated as in following diagram:



The role gives description of association bet' professor & Book. In this case professor is writer of associated book.

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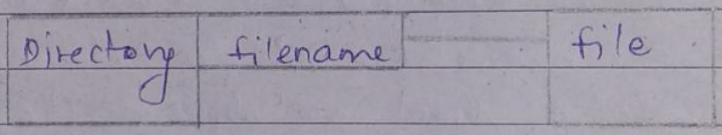
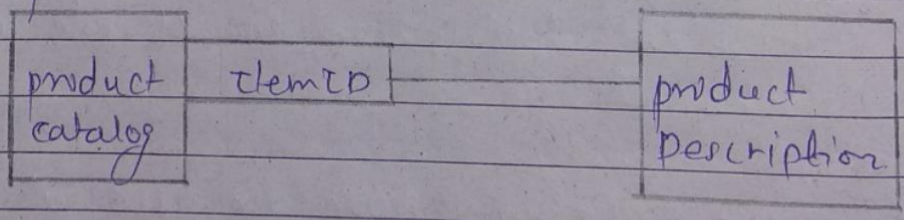
② Qualification – qualification relates two classes and a qualifier. Qualifier is a special attribute that reduces effective multiplicity of association. one-to-many or many-to-many may be qualified that can be reduced to one-to-one (but not always). It distinguishes among set of objects at many end of an association.

A qualified association can also be considered a form of ternary association.

ex – A directly plus a filename yields a file.



ex - A product catalog contains many product description & each one can be selected by ItemID.

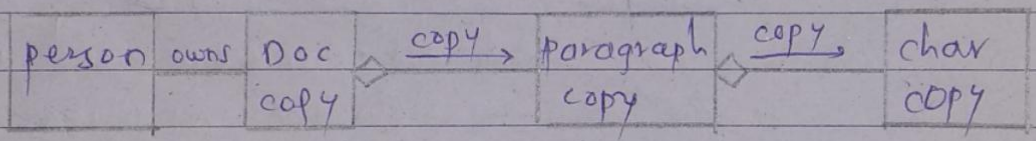


③ propagation of operation - propagation is automatic application of an operation to a network of objects when operation is applied to some starting object. It is also called triggering.

propagation is a mechanism where

an operation in an aggregate is implemented by having aggregate perform that operation on its parts.

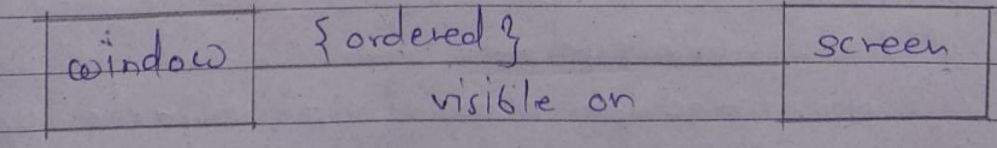
ex - A person owns multiple docs. Each doc is composed of paragraphs that are in turn composed of characters. The copy operation propagates from docs to paragraphs to character. The operation propagates from docs to paragraphs to character. The operation does not propagate in reverse direction.



propagation of operations.

④ Ordering - ordering is done in the case where 'objects should in order' is required. It is indicated by writing "{ordered}" next to multiplicity dot for the role.

ex - ordered sets in an association



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Q.3] What is object oriented ? Explain characteristics of object ?

→ object oriented is a new way of thinking about problems using models based on real world concept. The basic construct is object which combines both data structure and behaviour in single entity.

In object oriented system software is organized as collection of discrete objects that incorporate both data structure & behaviour.

Following are characteristics of object :-

① Identity -

- It means that data is organized into discrete distinguishable entities called objects. objects can be concrete or conceptual.
- In real world an object simply exist but within a programming language each object has unique handle by which it can be uniquely referenced.
- The handle can be implemented by address, array index or unique value of attributes.

② classification -

classification means that objects with same data structure (attribute) & behaviour (operation) are grouped into class.

③ polymorphism –

- polymorphism means that same operation (action or transformation that the object performs may behave differently on different classes.
- Specific implementation of an operation by certain class is called a method.

④ Inheritance –

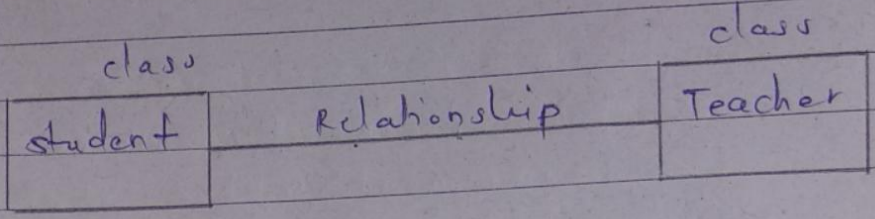
= It is sharing of attributes and operation among classes based on a hierarchical relationship.

- Subclasses can be formed from broadly defined class.
- Each subclass incorporates or inherits all the properties of its super class and adds its own unique properties.

Q.4] Explain three models and stages in OMT methodology.

i) object model – object model encompasses the ~~priet~~ principles of abstraction, encapsulation, modularity, hierarchy, concurrency & persistence.

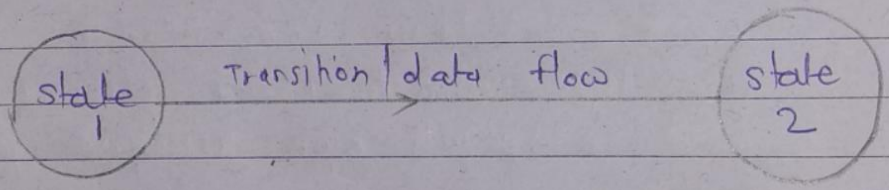
Object model basically emphasizes an object and class. It contains object diagram. object diagram is graph whose nodes are object classes and whose arcs are relationship among classes.



ii) Dynamic Model - Dynamic model describes aspect of system that change over time. It specifies & implement control aspects of system.

Main concept related to Dynamic model are states, transition between states and events to trigger the transitions.

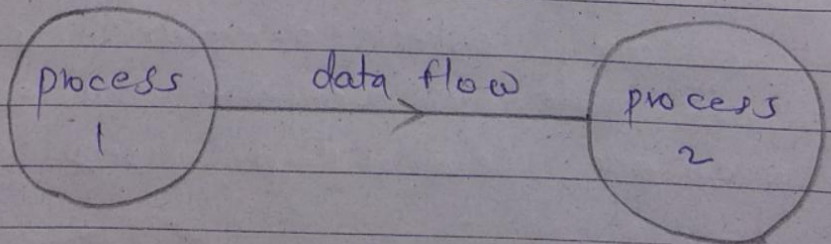
It contains state diagram which is graph whose nodes are states & whose are are data flows.



iii) Functional Model - functional model focuses on how data is flowing, where data is stored and different processes.

functional model describes data value transformation within system.

It contains data flow diagram, which is graph whose nodes are processes and whose arcs are data flows.



following are stages in OMT -

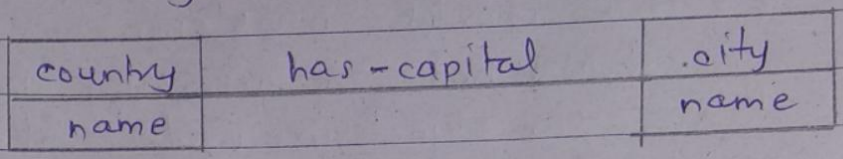
① Analysis - It is first place of object modeling technique. It involves preparation of precise and correct modeling of the real world problems.
It should not contain any implementation details. The object in model should be application domain concepts & not computer implementation concepts.

② system design - This is second phase & comes after analysis phase. The designer makes high level decision about the overall architecture - In system design the target system is organised as various subsystems based on both the analysis structure and the proposed architecture.

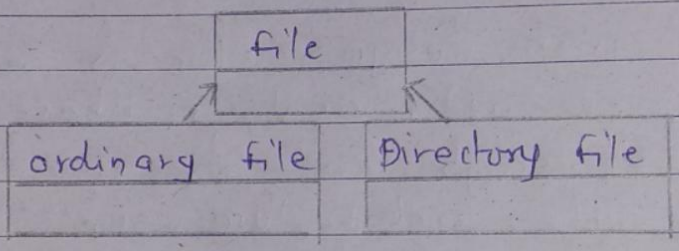
③ Object design - object design is third phase of object modelling technique. It is concerned with classification of objects into different classes & about attribute & neccessary operations needed.
In this phase, designer builds design model based on analysis model but containing implementation details.

Q.5) Draw class diagram of following statements with respect to object modeling.

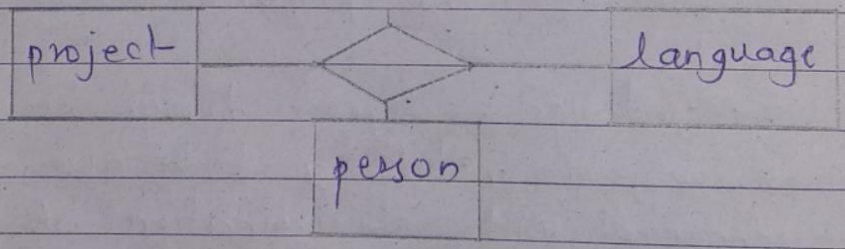
i) A country has capital city



ii) A file is an ordinary file or directory file



iii) A person uses computer language on project



iv) A polygon is composed of an ordered set of point