

Example of OO language

Unified Modeling Language (UML)

Phases

- Define the use case model:
 - Use case diagram
 - Use case scenarios
- Create UML diagrams.
- Develop class diagrams.
- Draw statechart diagrams.
- Modify the UML diagrams.
- Develop and document the system.

Using features of OO
model يمكن أقسامه
مجموعة Designs
رئي objects وهي الـ Designs
inherited features
لـ Designs آخر

يمكن أقسامه الـ Proj
لأجزاء inheritance ولكن
لا تعتمد على بعضها

Choosing a Method

- Choose either:
 - SDLC
 - Agile
 - Object-oriented methodologies

itself has no space

then space will be made for it.

Define Class & what's included in it?

Syntax:

```
modifier class <classname>
{
    Data Members;
    Member Functions ();
}
```

Example

```
public class Circle
{
    float float radius;
    String color;
    Find Area();
    Find Perimeter();
    Set color();
}
```

Data.

Method.

You create an object by specifying the class name.

Data

Class Variables

Instance variables

State.

Functions

Class Methods

Instance Methods

Behavior

Objects interact w/ each other, through methods sometimes call Message Passing.

4 Key concepts of OOP

1. Encapsulation: Binding/wrapping of code & Data together into a single unit is known as encapsulation.

1 Encapsulation 2 Abstraction
3 Inheritance 4 Polymorphism

Data in Class is hidden in encapsulation so also known as Data Hiding.

Access Restrictions by Access specifications

brings us to

→ Public
→ Private
→ Protected

2. Abstraction: is the property by which you hide the complexity of working inside an object & only the essential Details are exposed to the user. the non essential units are displayed to the user.

We use Abstract class & abstraction to achieve abstraction.

3. Inheritance: Family tree, OO Languages allow new classes to be formed by inheriting features of a base class. 1. One obj requires the properties & behaviors of a parent object. 2. Also provides code reusability. Ex: class → shape → circle, triangle, square.

4. Polymorphism: having many forms. Humans have diff blood groups → O, A, B, AB
Similarly in Java → Method overloading → multiple methods under same name
Method overriding → the derived class can use Base class method or have its own method implementation, which will override the Base class function.
Simplifies the usage of object methods by external code & java takes care of calling the right method w/ the help of the signature & declaration on these entities.

When to Use SDLC ?

- Systems have been developed and documented using SLDC.
- It is important to document each step.
- Upper level management feels more comfortable or safe using SDLC.
- There are adequate resources and time to complete the full SDLC.
- Communication of how new systems work is important.

More safe
More documented
Time frame 2yr

مستند
على التوثيق
Documentation

When to Use Agile ?

- There is a project champion of agile methods in the organization.
- Applications need to be developed quickly in response to a dynamic environment.
- A rescue takes place (the system failed and there is no time to figure out what went wrong).
- The customer is satisfied with incremental improvements.
- Executives and analysts agree with the principles of agile methodologies.

Time frame *
مستند
Customer
increments *
مستند
جزء جزئ

When to Use Object-Oriented

- The problems modeled lend themselves to classes.
- An organization supports the UML learning.
- Systems can be added gradually, one subsystem at a time. ما بيدي من فراغ مواء بال Agile أو بال SDLC بعكس ال
- Reuse of previously written software is a possibility. يفعل إذا بيدي أطور says from scratch وال يشتغلوا عليه حديش فيستخدم SDLC. عندهم الفرق يشتغلوا لساعات طويلة 1-51 بيها ما عندهم خبرة
- It is acceptable to tackle the difficult problems first.

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Summary

- Information is a key resource.
- Systems analysts deal with many types of information systems.
- Integration of traditional systems with new technologies
- Roles and qualities of the systems analyst
- The systems development life cycle
- CASE tools
- Agile systems development
- Object-oriented systems development