What is a file?	A named location which stores data or information permanently.
What is a class?	- It is a blueprint from which objects are created. A class contains methods and variables associated with an instance of a class. - Super-class: a class from which other classes inherit.
What is an object?	It is an instance of a class.The object has state and behaviour.
What is a constructor?	- It is a method used to create an object of a class. - Two types: default and parameterized constructor. - Default constructor: no arguments or all arguments have default values.

C++ v C	- **C++** is an object-oriented programming paradigm. Organizes software design around data, or objects, rather than functions and logic. - **C is a** structured programming language (programming language divides the problem into smaller structural blocks each of which handles a particular responsibility).
What are the basic OOPs principles?	OOPLs: object-oriented programming languages. - Encapsulation - Inheritance - Abstraction - Polymorphysm
Inheritance	A property in which the property of a parent class (superclass)is passed on to a child class (subclass).
Multiple inheritance	A process where a subclass can be derived from more than one superclass. - Advantage: class can inherit functionality of more than one base class. - Disadvantage: can be confusing if two base classes implement methods/variables with same name.

Polymorphysm	- The ability of an object to take on multiple forms. - Used in OOP: when a language process objects differently depending on their data type or class. - Example: class Shape with method Area; calculates differently for rectangle, circle…
Encapsulation	- It is defined as the wrapping up of data under a single unit. It is the mechanism that binds together code and the data it manipulates. - It is a protective shield that prevents the data from being accessed by the code outside this shield
Abstraction	We take out unnecessary details and only focus on aspects that are necessary to that context or system under consideration.
What are instance and class variables?	Instance variable belongs to a particular instance of that class, class variable also known as static variables.

Compare method and constructor	Constructor: used to initialize instance of a class. Method: used to perform some function or operation.
What is a singleton class?	It limits the number of objects created for a class to one, but gives flexibility of creating more objects if the situation changes.
What are the steps for creating an object?	1. Declared (variable declaration) 2. instantiated (new) 3. Initialization (constructor)
Access modifiers	1. No modifier: visible to overall package 2. Private: visible to class only 3. Public: visible to the world 4. Protected: visible to package and subclass

Wrapper class	Classes to access a primitive data type (boolean, characters, integers) as an object.
Overloading v Overriding	- Overloading: when two or more methods in the same class have same method name but different parameters - Overriding: two methods having the same method name and parameters, but one of the methods is in the parent class and the other is in the child class
What is a stream?	- Sequence of data. - Input stream: used to read data from a source. - Output stream: used to write data into destination.
What is an interface?	- Similar to a class but its collection of abstract methods (no implementation). - A class can implement multiple interfaces.

Class v Interface	- Interface cannot be instantiated - Interface doesn't have constructors - Interface only has abstract methods - Class implements interface and extends a class - Interface can extend multiple interfaces
Abstract class	- It may or may not contain abstract methods but, if a class has at least one abstract method, then it must be declared abstract. - Abstract class cannot be instantiated - To use it, we have to inherit it from another class - If we inherit an abstract class, we have to provide implementations to the abstract methods in it
Abstract method	A method that is declared, but contains no implementation.
Threads	- Threads are a way for a program to divide (*"split"*) itself into two or more simultaneously (or pseudo-simultaneously) running tasks. - The threads of a process share its executable code and the values of its dynamically allocated variables and non-thread-local global variables at any given time.

Multi-threading	The ability of a central processing unit (CPU) (or a single core in a multi-core processor) to provide multiple threads of execution concurrently, supported by the operating system.
Deadlock	A state in which each member of a group is waiting for another member, including itself, to take action
Process	A process is an executing instance of an application. A process can contain multiple threads.
Multi-processing	Multi-processing is the use of is the use of two or more central processing units (CPUs) within a single computer system.

<table>
<tr><td>Threads v Processes</td><td>- In most cases, a thread is a component of a process. (Depends on O.S. implementation)
- Multiple threads can exist within one process, executing concurrently and sharing resources such as memory, while different processes do not share these resources.
- Processes are independent of each other. Threads, since they share the same address are interdependent. Caution must be taken so different threads don’t step on each other.</td></tr>
<tr><td>Multi-treading Pros and Cons</td><td><table><tr><th>Pros</th><th>Cons (increased complexity)</th></tr><tr><td>.Better use of CPU resource.
.Enhanced performance by decreased development time.
.Simultaneous and parallelized occurrence of tasks.
.Less maintenance</td><td>.Complex debugging and testing.
.Difficulty level in writing a program.
Overhead switching of context.
.Result sometimes unpredictable.
.Likelihood of deadlock.</td></tr></table></td></tr>
<tr><td>Concurrency</td><td>In computer science, concurrency is the ability of different parts or units of a program, algorithm, or problem to be executed out-of-order or in partial order, without affecting the final outcome.</td></tr>
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