

Course Glossary

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Abstract class

A class that cannot be instantiated and can have abstract methods

Abstract method

A method without a body that subclasses of an abstract class must implement

Abstract method error

An error that occurs when an application attempts to call an abstract method directly

Abstraction

The concept of hiding implementation details and exposing functionality

Access control exception

A security-related exception that occurs when an operation is not allowed due to insufficient permissions

Access modifier

A keyword that defines the scope and visibility of a class, method, or variable (for example, public, private, or protected)

Annotation

A metadata tag in code that provides information to the compiler or at runtime and is often used for configuration or code generation

API (Application Programming Interface)

A set of functions and protocols for building and integrating applications

Applet

A small Java program that runs within a web browser or applet viewer

Argument

A value that is passed to a function or method when it is called

Arithmetic exception

An unchecked exception that occurs when an exceptional arithmetic condition arises, such as division by zero

Array

A fixed-size collection of elements of the same type

Array index out of bounds exception

An unchecked exception that is thrown when attempting to access an array with an invalid index

ArrayList

A resizable implementation of the list interface in Java.

Assertion error

An error that occurs when an assertion statement fails, typically used for debugging

Autoboxing

The automatic conversion of a primitive data type into its corresponding wrapper class object

Boolean

A data type that represents one of the two values: true or false

Break statement

A statement that exits a loop or switch statement when executed

BufferedReader

A class used for efficient reading of text from input streams

Bytecode

A low-level, platform-independent code generated by the Java compiler that runs on the Java Virtual Machine (JVM)

Casting

The process of converting one data type into another

Catch block

A block of code used to handle exceptions in a try-catch structure

charAt

A method used to access a character at a specific index in a string

Checked exception

An exception that must be declared in the method signature or handled using a try-catch block

Child class

A class that inherits from another class

Clarity

A benefit of comments that clarify complex logic, making it easier to understand

Class

A blueprint for creating objects in Java

Class attribute

A variable that is declared within a class and used to store object data

ClassCastException

An unchecked exception that occurs when an object is cast to an incompatible class

ClassLoader

A part of the Java Runtime Environment (JRE) responsible for dynamically loading classes into memory

ClassNotFoundException

A checked exception that occurs when an application tries to load a class by name but can't find it

CloneNotSupportedException

A checked exception that occurs when an object does not implement the cloneable interface but is being cloned

Collaboration

A benefit of comments that helps team members understand each other's work in a team environment

Comment

A note in the code that is not executed by the program and is used to explain, clarify, or annotate parts of the code for developers

Comparable

An interface that allows objects to be sorted based on natural ordering

Comparator

An interface used for defining custom sorting logic

Concatenation

The process of combining two or more strings

ConcurrentModificationException

An unchecked exception that occurs when a collection is modified while being iterated

Constructor

A special method used to initialize objects

Continue statement

A control statement that skips the current iteration of a loop and proceeds with the next iteration

Custom exception

A user-defined exception class that extends `Exception` or `RuntimeException`

Data encapsulation

The practice of restricting direct access to object data and allowing manipulation through methods

Data hiding

The concept of making class variables private and accessible only through public methods to ensure security

Deadlock

A condition where two or more threads are blocked forever, each waiting for the other to release resources

Default exception handler

The Java runtime's built-in mechanism for handling uncaught exceptions by printing the stack trace

Deque (Double-ended queue)

A data structure that allows insertion and deletion from both ends

Deserialization

The process of converting a byte stream back into an object

Documentation comment

A comment that is used for generating documentation using tools such as Javadoc

do-while loop

A control structure that executes a block of code at least once before checking the condition

Dynamic binding

The process of resolving method calls at runtime instead of compile time

Encapsulation

The practice of keeping data private and providing controlled access

Entry point

A starting method of a Java application, typically the `main` method

enum

A special class representing a fixed set of constants

EOFException

A checked exception that occurs when an end-of-file condition is unexpectedly reached during input

equals method

A method that compares the values of two strings or objects for equality

Error

A subclass of Throwable that represents serious problems that an application should not attempt to catch

Exception

An event that disrupts the normal execution of a program, requiring special handling

Exception chaining

A mechanism where one exception is caused by another, maintaining the cause of an exception

Exception handling

A programming mechanism for handling runtime errors and ensuring smooth program execution

Exception hierarchy

The structured classification of exceptions in Java, where all exceptions derive from Throwable

Explicit casting

A type conversion that requires the programmer to specify the target type

extends keyword

A keyword used by a class to indicate that it is inheriting from another class

File

A class representing file and directory paths in Java

final class

A class that cannot be extended or subclassed

final keyword

A keyword used to declare constants, prevent method overriding, or prevent inheritance

finally block

A block of code that executes after a try-catch structure, regardless of whether an exception occurs

Float

A primitive data type that represents decimal numbers with single precision

Folder structure for packages

A directory structure on the filesystem that should match the package declaration

For loop

A control flow statement that executes a block of code a fixed number of times

Garbage collection

The automatic process of reclaiming unused memory in Java to prevent memory leaks

Generic class

A class that can work with different data types using type parameters

Generics

A feature enabling type-safe operations on collections and classes

HashMap

A data structure that stores key-value pairs, allowing fast retrieval of values based on keys

Heap memory

A memory area where objects are dynamically allocated at runtime

if-else

A conditional statement that executes different code based on conditions

IllegalArgumentException

An unchecked exception that occurs when an illegal or inappropriate argument is passed to a method

IllegalStateException

An unchecked exception that occurs when a method is invoked at an inappropriate time

IllegalThreadStateException

An unchecked exception that occurs when a thread is in an inappropriate state for the requested operation

Immutable object

An object whose state cannot be changed after creation

Immutable

A property of String, meaning it cannot be modified after creation

implements keyword

A keyword used by a class to indicate that it is implementing an interface

Import statement

A statement that is used to include classes from other packages in a Java source file

IndexOutOfBoundsException

A superclass of exceptions that occur when accessing an index out of the valid range for an array or list

Infinite loop

A loop that runs indefinitely due to a missing or incorrect termination condition

Inheritance

A mechanism where a subclass derives properties and behaviors from a parent class

InputMismatchException

An unchecked exception that occurs when input does not match the expected data type

InputStream

A class used for reading byte streams

Instance method

A method associated with an instance of a class, requiring an object to be invoked

Interface

A blueprint for a class that defines abstract methods, which must be implemented by subclasses

InterruptedException

A checked exception that occurs when a thread is interrupted while waiting or sleeping

Iterator

An object that provides a way to traverse elements in a collection sequentially

Java Archive (JAR)

A package file format that contains compiled Java classes and resources

Java Development Kit (JDK)

A software development kit used to develop Java applications, including a compiler and libraries

Java Runtime Environment (JRE)

A software package that provides the libraries and components needed to run Java applications

Java Virtual Machine (JVM)

A virtual machine that executes Java bytecode and provides platform independence

java.io

A package that handles input and output operations

java.lang

A package that contains fundamental Java classes

java.net

A package that provides networking capabilities

java.sql

A package used for database connectivity

java.time

A package introduced in Java 8 for modern date and time handling

java.util

A package that provides utility classes for data structures and algorithms

JDBC (Java Database Connectivity)

An API for database interaction

join

A method that combines elements of an array into a single string

Lambda expression

A concise way to represent anonymous functions in Java, often used in functional programming

Lambda

A concise way to represent anonymous functions introduced in Java 8

length method

A method that returns the length of a string or an array

List

A collection that maintains an ordered sequence of elements and allows duplicates

Local variable

A variable declared inside a method or block, accessible only within that scope

Logical error

An error in a program that causes incorrect results but does not throw an exception

Loop

A control structure used to execute a block of code repeatedly while a condition is true

main class

A class in a Java application that contains the main method, serving as the entry point

Maintenance

A benefit of comments that provides context, making it easier to understand the code when revisiting it later

Math class

A class in Java that provides mathematical functions such as sqrt, pow, and abs

Method overloading

Defining multiple methods with the same name but different parameter lists in the same class.

Method overriding

Redefining a method in a subclass that is already defined in a parent class

Method signature

A unique identifier of a method, consisting of its name and parameter list

Method signature

The combination of a method name and parameter list that defines a method

Method

A block of code that performs a specific task in a class .

Module

A feature introduced in Java 9 for better dependency management.

Multi-catch block

A catch block that handles multiple exception types using a single catch block.

Multi-line comment

A comment that spans multiple lines

Multithreading

A programming technique that allows multiple threads to run concurrently

Mutable object

An object whose state can be changed after creation

NegativeArraySizeException

An unchecked exception that occurs when an attempt is made to create an array with a negative size

Nested class

A class defined inside another class

Nested try block

A try block inside another try block, allowing for more specific exception handling

new

A keyword used to create a new object explicitly

nextInt method

A method that reads an integer input using Scanner

nextLine method

A method that reads an entire line of input using Scanner

null keyword

A keyword that represents an absence of value in an object reference

NullPointerException

A runtime exception that occurs when attempting to access an object reference that is null

NumberFormatException

An unchecked exception that occurs when attempting to convert a string to a number, but the string is invalid

Object instantiation

A process of creating an instance of a class using the new keyword

Object

An instance of a class that encapsulates state (fields) and behavior (methods)

Optional

A container object introduced in Java 8 to handle null values safely

OutOfMemoryError

An error that occurs when the Java Virtual Machine (JVM) runs out of heap memory

OutputStream

A class used for writing byte streams

Overloading

The process of defining multiple methods with the same name but different parameters

Overriding

A process of defining a method in a subclass that replaces a method in the parent class

Package declaration

A statement that uses the package keyword at the top of a Java source file to define a package

Package

A namespace that groups related classes together

Parameter

A variable passed into a method to provide input values

Parent class

A class that is extended by another class in inheritance

parseDouble method

A method that converts a string to a double

parseInt method

A method that converts a string to an integer

Polymorphism

The ability of an object to take multiple forms, allowing methods to be called on objects of different types

Primitive data type

A basic data type in Java such as int, char, float, or Boolean

Private access modifier

A modifier that restricts access to a class member so it can only be accessed within the same class

Public access modifier

A modifier that allows a class, method, or variable to be accessible from anywhere in the application

Random class

A class that is used to generate random numbers

Record

A compact class type introduced in Java 14 for immutable data storage

Recursion

A programming technique where a method calls itself to solve a problem

Reflection

The ability of a program to inspect and manipulate its own structure at runtime

replace method

A method that replaces occurrences of a substring within a string

replace

A method that replaces a character or substring with another value

REST (Representational State Transfer)

A web service architecture that uses HTTP requests for communication

return type

A data type of the value that a method returns

Scanner class

A class that is used to take input from the user

Scope

The accessibility of a variable or method within a program

Serialization

The process of converting an object into a byte stream

Single-line comment

A comment that starts that applies only to the text following it on that line

Source file naming

A rule that states each public class should be in its own source file, named exactly after the class with a java extension

split method

A method that splits a string into an array based on a given delimiter

split

A method that divides a string into parts based on a delimiter

Stack memory

A memory area used for storing method call frames and local variables

StackOverflowError

An error that occurs when the call stack exceeds its limit due to deep or infinite recursion

Static method

A method that belongs to a class rather than an instance and can be called without creating an object

Static variable

A variable that belongs to a class rather than any specific instance

static

A keyword used to define class-level methods and variables

Stream

A sequence of elements supporting functional-style operations

String

A sequence of characters, implemented as an immutable object in Java

String literal

A way to create a string by enclosing text in double quotes

StringIndexOutOfBoundsException

An unchecked exception that occurs when accessing an invalid index in a string

substring method

A method that extracts a portion of a string based on the given indexes

substring

A method that extracts a part of a string

super keyword

A keyword that is used to refer to the parent class of the current object

switch

A control structure that allows multiple execution paths

Synchronized block

A block of code that ensures thread safety by allowing only one thread to execute at a time

synchronized

A keyword ensuring that only one thread can access a block of code at a time

System.out.println

A method that is used to print output to the console

this keyword

A keyword that is used to reference the current instance of a class

Thread

A lightweight process that runs concurrently with other threads

throw keyword

A keyword that is used to manually raise an exception

Throw keyword

A keyword used to explicitly throw an exception

throws keyword

A keyword that is used in a method signature to declare that the method may throw exceptions

throws

A declaration that a method may throw an exception

toLowerCase

A method that converts all characters in a string to lowercase

toUpperCase

A method that converts all characters in a string to uppercase

trim

A method that removes whitespace from the beginning and end of a string

try block

A block of code where exceptions are checked

try-catch

A mechanism to handle exceptions gracefully using try and catch blocks

Type casting

The process of converting one data type into another

unchecked exception

An exception that does not require explicit handling

Unchecked exception

An exception that is not checked at compile-time and usually results from programming errors

var

A keyword introduced in Java 10 for local variable type inference

Variable

A named storage location for data in a program

void

A return type indicating a method does not return a value

volatile

A keyword ensuring that a variable's value is always read from the main memory

while loop

A control structure that executes a block of code as long as a condition is true

Wrapper class

A class that provides an object representation for primitive data types