C vs Java Comparison Cheat Sheet

General Overview

Concept	C	Java
Language Type	Procedural	Object-Oriented
Compilation	Compiles to machine code	Compiles to bytecode (runs on JVM)
Memory Management	Manual (malloc, free)	Automatic (Garbage Collector)
Platform Dependency	Platform-dependent	Platform-independent (via JVM)
File Extension	.c	.java

Basic Syntax

Feature	C	Java
Hello World	printf("Hello, World");	System.out.println("Hello, World");
Main Function	int main()	public static void main(String[] args)
Comments	// and /* ... */	Same as C
Variable Decl.	int x = 5;	int x = 5;

Data Types

Concept	C	Java
Primitives	int, char, float	int, char, float, boolean
Strings	char[] or char*	String (Object)
Booleans	No real boolean type (use int)	boolean (true or false)
Structures	struct	Classes

Control Structures

Structure	C	Java
if / else	if (x > 0) {...}	Same as C
switch	switch(x) { case 1: break; }	Same (needs break)
loops	for, while, do-while	Same as C
break/continue	Supported	Supported

Functions vs Methods

Concept	C	Java
Function Def.	int add(int a, int b) { ... }	Inside class: int add(int a, int b) {}

C vs Java Comparison Cheat Sheet

Function Call	add(2, 3);	obj.add(2, 3); (if non-static)
No method outside class	Yes	No (all methods inside classes)

Memory and Pointers

Concept	C	Java
Pointers	Yes (int *ptr)	No explicit pointers
Memory Alloc.	malloc(), free()	new (GC handles deallocation)
Arrays	Fixed-size	Objects (with bounds checks)

Structs vs Classes

Feature	C	Java
User Type	struct	class
Access Control	None	public, private, protected
Methods inside	Not allowed	Allowed
Inheritance	Not supported	Fully supported

Object-Oriented Concepts (Java Only)

Class: Blueprint for objects

Object: Instance of a class

Inheritance: class A extends B {}

Interface: interface Flyable {}

Polymorphism: Method overriding and overloading

Encapsulation: Private fields + getters/setters

I/O

Task	C	Java
Input	scanf("%d", &x);	Scanner sc = new Scanner(System.in);
Output	printf("x = %d", x);	System.out.println("x = " + x);

Compilation & Execution

Task	C	Java
Compile	gcc file.c -o prog	javac file.java
Run	./prog	java ClassName

C vs Java Comparison Cheat Sheet

Error Handling

Concept	C	Java
Errors	No built-in exception handling	Try-catch-finally blocks
Example	Manual checks (if (ptr == NULL))	try { ... } catch (Exception e)