**Java 21 Top New Features – 2025**

**Virtual Threads (JEP 444)**

**Goal:** Handle high concurrency easily without complex async code. Refer Virtual thread doc.

**Pattern Matching for switch (JEP 441)**

**Goal:** Extend switch to work with patterns and types safely.

static String format(Object obj) {

return switch (obj) {

case Integer i -> "Integer: " + i;

case String s -> "String: " + s.toUpperCase();

case null -> "Null value!";

default -> "Unknown type";

};

}

public static void main(String[] args) {

System.out.println(format(123));

System.out.println(format("hello"));

System.out.println(format(null));

}

✅ No more instanceof and manual casting

✅ Handles null gracefully.

**Sequenced Collections (JEP 431)**

**Goal:** Add a **defined encounter order** to all collections.  
Now we can easily access **first / last elements** in Lists, Sets, and Maps. Refer Sequenced Collection doc.

**String Templates (JEP 430) – Preview Feature**

**Goal:** Replace unsafe string concatenation with **embedded expressions** safely and clearly.

// Enable preview features: --enable-preview --release 21

import static java.lang.StringTemplate.STR;

public class StringTemplateDemo {

public static void main(String[] args) {

String name = "Deb";

int score = 98;

String result = STR."Student \{name} scored \{score}% in the exam.";

System.out.println(result);

}

}

✅ Type-safe string interpolation

✅ Cleaner than "Student " + name + " scored " + score + "%".

✅ Supports custom processors for JSON, SQL, etc.