**Java Basics Coding Challenges**

**1. Primitive Data Types**

**Declare and initialize variables of all primitive types and print their default values.**

package codingchallenge;

public class First {

byte default\_byte;

short default\_short;

int default\_int;

long default\_long;

float default\_float;

double default\_double;

char default\_char;

boolean default\_boolean;

public static void main(String[] args) {

First p=new First();

System.*out*.println("Default value for byte: "+p.default\_byte);

System.*out*.println("Default value for short: "+p.default\_short);

System.*out*.println("Default value for int: "+p.default\_int);

System.*out*.println("Default value for long: "+p.default\_long);

System.*out*.println("Default value for float: "+p.default\_float);

System.*out*.println("Default value for double: "+p.default\_double);

System.*out*.println("Default value for char: "+p.default\_char);

System.*out*.println("Default value for boolean: "+p.default\_boolean);

}

}

**Write a program to detect overflow when adding two byte variables.**

package codingchallenge;

public class Second {

public static void main(String[] args) {

byte a1=75;

byte a2=80;

int sum=a1+a2;

if(sum>Byte.*MAX\_VALUE* || sum<Byte.*MIN\_VALUE*)

System.*out*.println("Overflow detected:"+sum);

else

System.*out*.println(sum);

}

}

}

**Use type casting to convert double to int and float to byte**

package codingchallenge;

public class Third {

public static void main(String[] args) {

double d=10;

int d1=(int)d;

float f=25;

byte b=(byte)f;

System.*out*.println("Double value: "+d);

System.*out*.println("After typecasting double to int:"+d1);

System.*out*.println("float value:"+f);

System.*out*.println("After typecasting float to byte:"+b);

}

}

**Perform bitwise operations between int and byte**

package codingchallenge;

public class Forth {

public static void main(String[] args) {

int a=100;

byte b=50;

System.*out*.println("Performing bitwise operations:");

System.*out*.println("AND operation:"+(a&b));

System.*out*.println("OR operation:"+(a|b));

System.*out*.println("XOR operation:"+(a^b));

System.*out*.println("NOT operation:"+~a);

System.*out*.println("Left Shift operation:"+(b<<a));

System.*out*.println("Right Shift operation:"+(b>>a));

}

}

**Accept input for all primitive types and display them formatted**

package codingchallenge;

import java.util.Scanner;

public class Fifth {

public static void main(String[] args) {

Scanner sc=new Scanner(System.*in*);

System.*out*.println("Enter byte value: ");

byte d\_byte=sc.nextByte();

System.*out*.println("Enter short value: ");

short d\_short=sc.nextShort();

System.*out*.println("Enter int value: ");

int d\_int=sc.nextInt();

System.*out*.println("Enter long value: ");

long d\_long=sc.nextLong();

System.*out*.println("Enter float value: ");

float d\_float=sc.nextFloat();

System.*out*.println("Enter double value: ");

double d\_double=sc.nextDouble();

System.*out*.println("Enter char value: ");

char d\_char=sc.next().charAt(0);

System.*out*.println("Enter boolean value: ");

boolean d\_boolean=sc.nextBoolean();

System.*out*.println("byte value: "+d\_byte);

System.*out*.println("short value: "+d\_short);

System.*out*.println("int value: "+d\_int);

System.*out*.println("long value: "+d\_long);

System.*out*.println("float value: "+d\_float);

System.*out*.println("double value: "+d\_double);

System.*out*.println("char value: "+d\_char);

System.*out*.println("boolean value: "+d\_boolean);

}

}

**2. Variables**

**Swap two numbers using a temporary variable.**

package codingchallenge;

public class Sixth {

public static void main(String[] args) {

int a=10;

int b=20;

System.*out*.println("Before swapping: "+a+" "+b);

int temp=a;

a=b;

b=temp;

System.*out*.println("After swapping: "+a+" "+b);

}

}

**Swap two numbers without a temporary variable**

package codingchallenge;

public class Seventh {

public static void main(String[] args) {

int a=10;

int b=20;

System.*out*.println("Before swapping: "+a+" "+b);

a=a+b;

b=a-b;

a=a-b;

System.*out*.println("After swapping: "+a+" "+b);

}

}

**Demonstrate variable shadowing within a class and method.**

package codingchallenge;

public class Eight {

int a=10;

public void print()

{

int a=20;

System.*out*.println("Instance variable: "+this.a);

System.*out*.println("Local variable: "+a);

}

public static void main(String[] args) {

Eight v=new Eight();

v.print();

}

}

**Declare a constant and use it in calculations.**

package codingchallenge;

public class Ninth {

public static void main(String[] args) {

final double pi= 3.14;

int radius=10;

double area=pi\*radius\*radius;

System.*out*.println("Area of circle: "+area);

}

}

**Create a class with instance, static, and local variables and demonstrate scope**

package codingchallenge;

public class Tenth {

int a=10;

public static int *c*=30;

public void display() {

int b=20;

System.*out*.println("Instance variable: "+this.a);

System.*out*.println("Local variable: "+b);

System.*out*.println("static variable: "+*c*);

}

public static void main(String[] args) {

Tenth v=new Tenth();

v.display();

}

}

**3. Operators**

**Demonstrate all arithmetic operators using two integers.**

package codingchallenge;

import java.util.Scanner;

public class Eleventh {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter first integer (a): ");

int a = sc.nextInt();

System.*out*.print("Enter second integer (b): ");

int b = sc.nextInt();

System.*out*.println("Addition (a + b): " + (a + b));

System.*out*.println("Subtraction (a - b): " + (a - b));

System.*out*.println("Multiplication (a \* b): " + (a \* b));

if (b != 0) {

System.*out*.println("Division (a / b): " + (a / b));

System.*out*.println("Modulus (a % b): " + (a % b));

} else {

System.*out*.println("Division and Modulus not possible (b is 0)");

}

sc.close();

}

}

**Use relational operators to compare ages.**

package codingchallenge;

import java.util.Scanner;

public class Twelth {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter age of Person A: ");

int A = sc.nextInt();

System.*out*.print("Enter age of Person B: ");

int B = sc.nextInt();

System.*out*.println("A == B : " + (A == B));

System.*out*.println("A != B : " + (A != B));

System.*out*.println("A > B : " + (A > B));

System.*out*.println("A < B : " + (A < B));

System.*out*.println("A >= B : " + (A >= B));

System.*out*.println("A <= B : " + (A <= B));

sc.close();

}

}

**Implement a basic calculator using switch and operators.**

package codingchallenge;

import java.util.Scanner;

public class Thirteenth {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter first number: ");

double num1 = sc.nextDouble();

System.*out*.print("Enter second number: ");

double num2 = sc.nextDouble();

System.*out*.print("Enter operator (+, -, \*, /, %): ");

char operator = sc.next().charAt(0);

switch (operator) {

case '+':

System.*out*.println("Result: " + (num1+num2));

break;

case '-':

System.*out*.println("Result: " + (num1-num2));

break;

case '\*':

System.*out*.println("Result: " + (num1\*num2));

break;

case '/':

if (num2 != 0)

System.*out*.println("Result: " + (num1/num2));

else

System.*out*.println("Error: Division by zero");

break;

case '%':

if (num2 != 0)

System.*out*.println("Result: " + (num1%num2));

else

System.*out*.println("Error: Modulus by zero");

break;

default:

System.*out*.println("Invalid operator");

}

sc.close();

}

}

**Use bitwise AND, OR, XOR on two binary values.**

package codingchallenge;

import java.util.Scanner;

public class Fourteenth {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter first number (a): ");

int a = sc.nextInt();

System.*out*.print("Enter second number (b): ");

int b = sc.nextInt();

int and = a & b;

int or = a | b;

int xor = a ^ b;

System.*out*.println("Binary of a: " + Integer.*toBinaryString*(a));

System.*out*.println("Binary of b: " + Integer.*toBinaryString*(b));

System.*out*.println("a & b (AND) = " + and + " (" + Integer.*toBinaryString*(and) + ")");

System.*out*.println("a | b (OR) = " + or + " (" + Integer.*toBinaryString*(or) + ")");

System.*out*.println("a ^ b (XOR) = " + xor + " (" + Integer.*toBinaryString*(xor) + ")");

sc.close();

}

}

**Demonstrate logical operators with Boolean expressions.**

package codingchallenge;

import java.util.Scanner;

public class Fifteenth {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter age: ");

int age = sc.nextInt();

System.*out*.print("Are you a student? (true/false): ");

boolean isStudent = sc.nextBoolean();

boolean eligibleForDiscount = (age < 25) && isStudent;

System.*out*.println("Eligible for student discount: " + eligibleForDiscount);

boolean needsID = (age < 18) || isStudent;

System.*out*.println("Needs student ID or parental consent: " + needsID);

boolean notStudent = !isStudent;

System.*out*.println("Not a student: " + notStudent);

sc.close();

}

}

**4. String Concatenation**

**Concatenate first name and last name.**

package codingchallenge;

import java.util.Scanner;

public class Sixteenth {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter first name: ");

String firstName = sc.nextLine().trim();

System.*out*.print("Enter last name: ");

String lastName = sc.nextLine().trim();

String Name = firstName + " " + lastName;

System.*out*.println("Full Name: " + Name);

sc.close();

}

}

**Combine name, age, and address using string concatenation.**

package codingchallenge;

import java.util.Scanner;

public class Seventeenth {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter your name: ");

String name = sc.nextLine();

System.*out*.print("Enter your age: ");

int age = sc.nextInt();

sc.nextLine();

System.*out*.print("Enter your address: ");

String address = sc.nextLine();

String Details = "Name: " + name + ", Age: " + age + ", Address: " + address;

System.*out*.println("User Info: " + Details);

sc.close();

}

}

**Use concatenation inside a loop to build a pattern.**

package codingchallenge;

import java.util.Scanner;

public class Eighteenth {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter a character or symbol: ");

String symbol = sc.next();

System.*out*.print("Enter number of lines: ");

int lines = sc.nextInt();

String p = "";

for (int i = 1; i <= lines; i++) {

p += symbol;

System.*out*.println(p);

}

sc.close();

}

}

**Demonstrate precedence of concatenation and addition.**

package codingchallenge;

public class Ninteenth {

public static void main(String[] args) {

System.*out*.println(1 + 2 + "abc");

System.*out*.println("abc" + 1 + 2);

System.*out*.println("1 + 2 = " + 1 + 2);

System.*out*.println("1 + 2 = " + (1 + 2));

}

}

**Accept input strings and concatenate with formatting.**

package codingchallenge;

public class Twenty {

public static void main(String[] args) {

String firstName = "John";

String lastName = "walter";

System.*out*.println(firstName + " " + lastName);

}

}

**5. StringBuilder**

**Reverse a string using StringBuilder.**

package codingchallenge;

public class TwentyOne {

public static void main(String[] args) {

String input = "Hello World!";

StringBuilder sb = new StringBuilder(input);

sb.reverse();

System.*out*.println(sb.toString());

}

}

**Append multiple strings using StringBuilder and print.**

package codingchallenge;

public class TwentyTwo {

public static void main(String[] args) {

StringBuilder sb = new StringBuilder();

sb.append("Hello, ");

sb.append("world");

sb.append("!");

sb.append(" Welcome to Java.");

System.*out*.println(sb.toString());

}

}

**Replace characters in a string using StringBuilder.**

package codingchallenge;

public class TwentyThree {

public static void main(String[] args) {

StringBuilder sb = new StringBuilder("Hello World!");

sb.replace(6, 11, "Java");

System.*out*.println(sb.toString());

}

}

**Insert a word into a string at a specific position.**

package codingchallenge;

public class TwentyFour {

public static void main(String[] args) {

String original = "Hello World!";

String wordToInsert = "Beautiful ";

int position = 6;

StringBuilder sb = new StringBuilder(original);

sb.insert(position, wordToInsert);

String result = sb.toString();

System.*out*.println(result);

}

}

**Delete part of a string using StringBuilder.**

package codingchallenge;

public class TwentyFive {

public static void main(String[] args) {

StringBuilder sb = new StringBuilder("Hello, World!");

sb.delete(5, 7);

System.*out*.println(sb.toString());

}

}

**6. String API**

**Use charAt(), length(), and substring() methods.**

package codingchallenge;

public class TwentySix {

public static void main(String[] args) {

String str = "Hello World";

char ch = str.charAt(0);

int len = str.length();

String sub1 = str.substring(6);

String sub2 = str.substring(0, 5);

System.*out*.println("Character at index 0: " + ch);

System.*out*.println("Length of string: " + len);

System.*out*.println("Substring from index 6: " + sub1);

System.*out*.println("Substring from 0 to 5: " + sub2);

}

}

**Count the number of vowels in a string.**

package codingchallenge;

import java.util.Scanner;

public class TwentySeven {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter a string: ");

String input = sc.nextLine();

int vowelCount = 0;

String lowerInput = input.toLowerCase();

for (int i = 0; i < lowerInput.length(); i++) {

char ch = lowerInput.charAt(i);

if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {

vowelCount++;

}

}

System.*out*.println("Number of vowels: " + vowelCount);

sc.close();

}

}

**Check if a string is a palindrome.**

package codingchallenge;

import java.util.Scanner;

public class TwentyEight {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter a string: ");

String input = sc.nextLine();

String normalized = input.replaceAll("\\s+", "").toLowerCase();

String reversed = new StringBuilder(normalized).reverse().toString();

if (normalized.equals(reversed)) {

System.*out*.println("The string is a palindrome.");

}

else {

System.*out*.println("The string is NOT a palindrome.");

}

sc.close();

}

}

**Convert a string to upper case and lower case.**

package codingchallenge;

public class TwentyNine {

public static void main(String[] args) {

String original = "Hello World!";

String upper = original.toUpperCase();

System.*out*.println("Upper case: " + upper);

String lower = original.toLowerCase();

System.*out*.println("Lower case: " + lower);

}

}

**Remove spaces and special characters from a string.**

package codingchallenge;

public class Thirty{

public static void main(String[] args) {

String input = "Hello! How are you? #Good -morning!";

String cleaned = input.replaceAll("[^a-zA-Z0-9]", "");

System.*out*.println("Original: " + input);

System.*out*.println("After removing spaces and special characters: " + cleaned);

}

}

**7. Date, Time, and Numeric Objects**

**Get current date and time using LocalDateTime.**

package codingchallenge;

import java.time.LocalDateTime;

public class One {

public static void main(String[] args) {

LocalDateTime currentDateTime = LocalDateTime.*now*();

System.*out*.println("Current Date and Time: " + currentDateTime);

}

}

**Calculate age given a birth date.**

package codingchallenge;

import java.time.LocalDate;

import java.time.Period;

public class Two {

public static void main(String[] args) {

LocalDate birthDate = LocalDate.*of*(1990, 7, 28);

LocalDate currentDate = LocalDate.*now*();

Period age = Period.*between*(birthDate, currentDate);

System.*out*.println("Age is: " + age.getYears() + " years, "

+ age.getMonths() + " months, and "

+ age.getDays() + " days.");

}

}

**Format date in dd-MM-yyyy format.**

package codingchallenge;

import java.time.LocalDate;

import java.time.format.DateTimeFormatter;

public class Three {

public static void main(String[] args) {

LocalDate currentDate = LocalDate.*now*();

DateTimeFormatter formatter = DateTimeFormatter.*ofPattern*("dd-MM-yyyy");

String formattedDate = currentDate.format(formatter);

System.*out*.println("Formatted Date: " + formattedDate);

}

}

**Add 5 days to current date and print.**

package codingchallenge;

import java.time.LocalDate;

import java.time.format.DateTimeFormatter;

public class Four {

public static void main(String[] args) {

LocalDate currentDate = LocalDate.*now*();

LocalDate newDate = currentDate.plusDays(5);

DateTimeFormatter formatter = DateTimeFormatter.*ofPattern*("dd-MM-yyyy");

String formattedDate = newDate.format(formatter);

System.*out*.println("Current Date: " + currentDate.format(formatter));

System.*out*.println("Date after adding 5 days: " + formattedDate);

}

}

**Round a decimal to 2 places using BigDecimal.**

package codingchallenge;

import java.math.BigDecimal;

import java.math.RoundingMode;

public class Five {

public static void main(String[] args) {

BigDecimal number = new BigDecimal("123.4567");

BigDecimal rounded = number.setScale(2, RoundingMode.*HALF\_UP*);

System.*out*.println("Original number: " + number);

System.*out*.println("Rounded number: " + rounded);

}

}

**8. Flow Control**

**Use if-else to determine if a number is positive, negative, or zero.**

package codingchallenge;

public class Six {

public static void main(String[] args) {

int number = -10;

if (number > 0) {

System.*out*.println(number + " is positive.");

}

else if (number < 0) {

System.*out*.println(number + " is negative.");

}

else {

System.*out*.println(number + " is zero.");

}

}

}

**Implement nested if to find the largest among 3 numbers.**

package codingchallenge8;

public class Seven {

public static void main(String[] args) {

int a = 15;

int b = 42;

int c = 27;

int largest;

if (a >= b) {

if (a >= c) {

largest = a;

} else {

largest = c;

}

} else {

if (b >= c) {

largest = b;

} else {

largest = c;

}

}

System.*out*.println("The largest number is: " + largest);

}

}

**Validate login with username and password.**

package codingchallenge;

import java.util.Scanner;

public class Eight {

static boolean validateLogin(String username, String password) {

String validUsername = "root";

String validPassword = "54657";

return username.equals(validUsername) && password.equals(validPassword);

}

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter username: ");

String username = sc.nextLine();

System.*out*.print("Enter password: ");

String password = sc.nextLine();

if (*validateLogin*(username, password)) {

System.*out*.println("Successfully logged in");

} else {

System.*out*.println("Wrong username or password");

}

}

}

**Categorize age groups using if-else ladder.**

package codingchallenge;

public class Nine {

public static void main(String[] args) {

int age = 25;

if (age < 0) {

System.*out*.println("Invalid age");

} else if (age <= 12) {

System.*out*.println("Child");

} else if (age <= 19) {

System.*out*.println("Teen");

} else if (age <= 59) {

System.*out*.println("Adult");

} else {

System.*out*.println("Senior");

}

}

}

**Determine student grade using percentage.**

package codingchallenge;

import java.util.Scanner;

public class Ten {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.println("Enter marks for 5 subjects:");

int m1 = sc.nextInt();

int m2 = sc.nextInt();

int m3 = sc.nextInt();

int m4 = sc.nextInt();

int m5 = sc.nextInt();

int total = m1 + m2 + m3 + m4 + m5;

float percentage = total / 5f;

System.*out*.println("Total Marks: " + total);

System.*out*.println("Percentage: " + percentage);

if (percentage >= 90) {

System.*out*.println("Grade: A");

} else if (percentage >= 80) {

System.*out*.println("Grade: B");

} else if (percentage >= 70) {

System.*out*.println("Grade: C");

} else if (percentage >= 60) {

System.*out*.println("Grade: D");

} else if (percentage >= 40) {

System.*out*.println("Grade: E");

} else {

System.*out*.println("Grade: F");

}

}

}

**9. Conditions**

**Check if a number is even and divisible by 5.**

package codingchallenge;

public class Eleven {

public static void main(String[] args) {

int number = 50;

if (number % 2 == 0 && number % 5 == 0) {

System.*out*.println(number + " is even and divisible by 5.");

} else {

System.*out*.println(number + " is NOT even and divisible by 5.");

}

}

}

**Validate a triangle (sum of angles = 180).**

package codingchallenge;

import java.util.Scanner;

public class Twelve {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.println("Enter three angles of the triangle:");

int angle1 = sc.nextInt();

int angle2 = sc.nextInt();

int angle3 = sc.nextInt();

if (angle1 > 0 && angle2 > 0 && angle3 > 0 && (angle1 + angle2 + angle3 == 180)) {

System.*out*.println("It is a valid triangle.");

} else {

System.*out*.println("It is NOT a valid triangle.");

}

sc.close();

}

}

**Check if year is a leap year.**

package codingchallenge;

import java.time.Year;

public class Thirteen {

public static void main(String[] args) {

int year = 2024;

boolean isLeap = Year.*isLeap*(year);

if (isLeap) {

System.*out*.println(year + " is a leap year.");

} else {

System.*out*.println(year + " is not a leap year.");

}

}

}

**Check character type (vowel/consonant/digit/special).**

package codingchallenge;

public class Fourteen {

public static void main(String[] args) {

char ch = 'A';

char lowerCh = Character.*toLowerCase*(ch);

if ( (lowerCh >= 'a' && lowerCh <= 'z') ) {

if (lowerCh == 'a' || lowerCh == 'e' || lowerCh == 'i' || lowerCh == 'o' || lowerCh == 'u') {

System.*out*.println(ch + " is a vowel.");

} else {

System.*out*.println(ch + " is a consonant.");

}

} else if (ch >= '0' && ch <= '9') {

System.*out*.println(ch + " is a digit.");

} else {

System.*out*.println(ch + " is a special character.");

}

}

}

**Check eligibility for vote, driving, and job using conditions.**

package codingchallenge;

public class Fifteen {

public static void main(String[] args) {

int age = 20;

boolean isCitizen = true;

if (isCitizen && age >= 18) {

System.*out*.println("Eligible to vote.");

} else {

System.*out*.println("Not eligible to vote.");

}

if (age >= 18) {

System.*out*.println("Eligible for driving licence (car/bike over 50cc).");

} else if (age >= 16) {

System.*out*.println("Eligible for driving licence (two-wheeler under 50cc).");

} else {

System.*out*.println("Not eligible for driving licence.");

}

if (age >= 18 && age <= 30) {

System.*out*.println("Eligible for general government jobs.");

}

else {

System.*out*.println("Not eligible for general government jobs.");

}

}

}

**10. Switch**

**Create a calculator using switch.**

package codingchallenge1;

import java.util.Scanner;

public class Sixteen {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter the first number: ");

double num1 = sc.nextDouble();

System.*out*.print("Enter the second number: ");

double num2 = sc.nextDouble();

System.*out*.print("Enter an operator (+, -, \*, /): ");

char operator = sc.next().charAt(0);

double result;

switch (operator) {

case '+':

result = num1 + num2;

System.*out*.println("Result: " + result);

break;

case '-':

result = num1 - num2;

System.*out*.println("Result: " + result);

break;

case '\*':

result = num1 \* num2;

System.*out*.println("Result: " + result);

break;

case '/':

if (num2 != 0) {

result = num1 / num2;

System.*out*.println("Result: " + result);

} else {

System.*out*.println("Error: Division by zero is not allowed.");

}

break;

default:

System.*out*.println("Error: Invalid operator.");

break;

}

sc.close();

}

}

**Map number to month name using switch.**

package codingchallenge;

import java.util.Scanner;

public class Seventeen {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter month number (1-12): ");

int monthNumber = sc.nextInt();

String monthName;

switch (monthNumber) {

case 1:

monthName = "January";

break;

case 2:

monthName = "February";

break;

case 3:

monthName = "March";

break;

case 4:

monthName = "April";

break;

case 5:

monthName = "May";

break;

case 6:

monthName = "June";

break;

case 7:

monthName = "July";

break;

case 8:

monthName = "August";

break;

case 9:

monthName = "September";

break;

case 10:

monthName = "October";

break;

case 11:

monthName = "November";

break;

case 12:

monthName = "December";

break;

default:

monthName = "Invalid month number";

break;

}

System.*out*.println("Month: " + monthName);

sc.close();

}

}

**Implement a simple menu using switch**

package codingchallenge;

import java.util.Scanner;

public class Eighteen {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

int choice;

do {

System.*out*.println("=== Simple Menu ===");

System.*out*.println("1. Say Hello");

System.*out*.println("2. Display Current Date");

System.*out*.println("3. Add Two Numbers");

System.*out*.println("4. Exit");

System.*out*.print("Enter your choice (1-4): ");

choice = sc.nextInt();

switch (choice) {

case 1:

System.*out*.println("Hello! Welcome to the simple menu program.");

break;

case 2:

java.time.LocalDate currentDate = java.time.LocalDate.*now*();

System.*out*.println("Today's date is: " + currentDate);

break;

case 3:

System.*out*.print("Enter first number: ");

int num1 = sc.nextInt();

System.*out*.print("Enter second number: ");

int num2 = sc.nextInt();

System.*out*.println("Sum: " + (num1 + num2));

break;

case 4:

System.*out*.println("Exiting the program. Goodbye!");

break;

default:

System.*out*.println("Invalid choice. Please select a number between 1 and 4.");

break;

}

System.*out*.println(); // blank line for readability

} while (choice != 4);

sc.close();

}

}

**Use enhanced switch (Java 14+) for better syntax.**

package codingchallenge;

import java.util.Scanner;

import java.time.LocalDate;

public class Ninteen {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

int choice;

do {

System.*out*.println("=== Simple Menu ===");

System.*out*.println("1. Say Hello");

System.*out*.println("2. Display Current Date");

System.*out*.println("3. Add Two Numbers");

System.*out*.println("4. Exit");

System.*out*.print("Enter your choice (1-4): ");

choice = sc.nextInt();

switch (choice) {

case 1 -> System.*out*.println("Hello! Welcome to the simple menu program.");

case 2 -> System.*out*.println("Today's date is: " + LocalDate.*now*());

case 3 -> {

System.*out*.print("Enter first number: ");

int num1 = sc.nextInt();

System.*out*.print("Enter second number: ");

int num2 = sc.nextInt();

System.*out*.println("Sum: " + (num1 + num2));

}

case 4 -> System.*out*.println("Exiting the program. Goodbye!");

default -> System.*out*.println("Invalid choice. Please select a number between 1 and 4.");

}

System.*out*.println();

} while (choice != 4);

sc.close();

}

}

**Implement day of the week based on integer input.**

package codingchallenge;

import java.util.Scanner;

public class Twenty {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter day number (1-7): ");

int dayNumber = sc.nextInt();

String dayName;

switch (dayNumber) {

case 1:

dayName = "Sunday";

break;

case 2:

dayName = "Monday";

break;

case 3:

dayName = "Tuesday";

break;

case 4:

dayName = "Wednesday";

break;

case 5:

dayName = "Thursday";

break;

case 6:

dayName = "Friday";

break;

case 7:

dayName = "Saturday";

break;

default:

dayName = "Invalid day number";

break;

}

System.*out*.println("Day: " + dayName);

sc.close();

}

}

**11. Loop & Branching**

**Print multiplication table for a number.**

package codingchallenge;

import java.util.Scanner;

public class One {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter a number to print its multiplication table: ");

int number = sc.nextInt();

System.*out*.println("Multiplication table for " + number + ":");

for (int i = 1; i <= 10; i++) {

System.*out*.println(number + " x " + i + " = " + (number \* i));

}

sc.close();

}

}

**Use break and continue in loops.**

package codingchallenge;

public class Two {

public static void main(String[] args) {

System.*out*.println("Using break and continue in a for loop:");

for (int i = 1; i <= 10; i++) {

if (i % 2 == 0) {

continue;

}

System.*out*.println("Current number is: " + i);

if (i == 7) {

System.*out*.println("Reached 7, breaking the loop.");

break;

}

}

System.*out*.println("Loop ended.");

}

}

**Find factorial of a number.**

package codingchallenge;

import java.util.Scanner;

public class Three {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter a non-negative integer: ");

int number = sc.nextInt();

if (number < 0) {

System.*out*.println("Factorial is not defined for negative numbers.");

}

else {

long factorial = 1;

for (int i = 1; i <= number; i++) {

factorial \*= i;

}

System.*out*.println("Factorial of " + number + " is: " + factorial);

}

}

}

**Print Fibonacci series.**

package codingchallenge;

import java.util.Scanner;

public class Four {

public static void main(String[] args) {

Scanner sc = new Scanner(System.*in*);

System.*out*.print("Enter the number of terms for Fibonacci series: ");

int terms = sc.nextInt();

if (terms <= 0) {

System.*out*.println("Please enter a positive integer greater than zero.");

} else {

System.*out*.println("Fibonacci series up to " + terms + " terms:");

long first = 0, second = 1;

for (int i = 1; i <= terms; i++) {

System.*out*.print(first + " ");

long next = first + second;

first = second;

second = next;

sc.close();

}

}

**Find sum of even numbers from 1 to 100.**

package codingchallenge;

public class Five {

public static void main(String[] args) {

int sum = 0;

for (int i = 1; i <= 100; i++) {

if (i % 2 == 0) {

sum += i;

}

}

System.*out*.println("Sum of even numbers from 1 to 100 is: " + sum);

}

}

**12. Arrays**

**Find the largest and smallest element in an array.**

package codingchallenge;

public class Six {

public static void main(String[] args) {

int[] numbers = {20,30,45,67,83};

int largest = numbers[0];

int smallest = numbers[0];

for (int num : numbers) {

if (num > largest) {

largest = num;

}

if (num < smallest) {

smallest = num;

}

}

System.*out*.println("Array elements: ");

for (int num : numbers) {

System.*out*.print(num + " ");

}

System.*out*.println();

System.*out*.println("Largest element: " + largest);

System.*out*.println("Smallest element: " + smallest);

}

}

**Sort an array in ascending order.**

package codingchallenge;

import java.util.Arrays;

public class Seven {

public static void main(String[] args) {

int[] numbers = {45, 12, 78, 34, 89, 5, 23};

Arrays.*sort*(numbers);

System.*out*.println("Sorted array in ascending order:");

for (int num : numbers) {

System.*out*.print(num + " ");

}

}

}

**Calculate average of numbers in an array.**

Package codingchallenge;

public class Eight

public static void main(String[] args) {

int[] numbers = {10, 20, 30, 40, 50};

int sum = 0;

for (int num : numbers) {

sum += num;

}

double average = (double) sum / numbers.length; division

System.*out*.println("Average: " + average);

}

}

**Count occurrence of an element.**

package codingchallenge;

public class Nine {

public static void main(String[] args) {

int[] numbers = {5, 3, 7, 5, 8, 5, 2, 3, 5};

int elementToCount = 5;

int count = 0;

for (int num : numbers) {

if (num == elementToCount) {

count++;

}

}

System.*out*.println("Element " + elementToCount + " occurs " + count + " times in the array.");

}

}

**Reverse elements of an array.**

package codingchallenge;

public class Ten {

public static void main(String[] args) {

int[] numbers = {5, 3, 7, 8, 2, 9};

System.*out*.println("Original array:");

for (int num : numbers) {

System.*out*.print(num + " ");

}

System.*out*.println();

int left = 0;

int right = numbers.length - 1;

while (left < right) {

int temp = numbers[left];

numbers[left] = numbers[right];

numbers[right] = temp;

left++;

right--;

}

System.*out*.println("Reversed array:");

for (int num : numbers) {

System.*out*.print(num + " ");

}

}

}