Java Industry-Oriented Assignments

This document contains 5 practical Java assignments based on real-world industry applications. These are designed to help participants gain hands-on experience with Java primitive data types, wrapper classes, and various operators including arithmetic, relational, bitwise, logical, and assignment operators.

Assignment 1: EMI Calculator for a Banking Application

Domain: Fintech / Banking

Concepts: Primitive data types, arithmetic operators, type casting, wrapper classes

Design a Java program to calculate the Equated Monthly Installment (EMI) for a loan. Input: Principal (double), Interest rate (float), Tenure (int in years) Formula: EMI = [P × R × (1+R)^N] / [(1+R)^N - 1] Use wrapper classes for input parsing and apply correct arithmetic and type conversion. Print EMI and total payment rounded to 2 decimals.

Assignment 2: IoT Sensor Data Normalization

Domain: IoT / Smart Home

Concepts: Primitive types, bitwise operators, logical operators, wrapper methods

A smart sensor sends 8-bit integers. Each bit has a signal. Use bitwise & logical operators to extract values and take actions (e.g., motion + light off = turn on light). Use wrapper methods like Integer.toBinaryString(). Output human-readable statuses and alerts.

Assignment 3: E-Commerce Price Comparison Engine

Domain: E-Commerce

Concepts: Comparison, relational, arithmetic, ternary operators, wrapper methods

Take product prices from 3 websites. Find the lowest, highest, and price difference percentage using arithmetic and comparison operators. Use ternary operators for clean logic and wrapper classes for input parsing. Print all prices, best deal, and difference %.

Assignment 4: Employee Salary Tax Estimator

Domain: HR / Payroll

Concepts: Data types, assignment operators, compound operators, wrapper parsing

Calculate annual salary and apply tax slabs based on input monthly salary. Use compound operators (+=, -=) and type casting as needed. Parse input using wrapper methods. Output tax, annual and net salary.

Assignment 5: Analytics Dashboard — Age Group Categorization

Domain: Data Analytics / Healthcare

Concepts: Logical, relational operators, wrapper conversions

Given a list of patient ages as strings, convert and categorize into Child, Teen, Adult, Senior using logical and relational operators. Count group sizes and percentages. Use Integer.parseInt() and increment operators.