**Exercise 7: Financial Forecasting**

**CODE:**

**FinancialForecast.java:**

public class FinancialForecast {

public static double forecast(double currentValue, double growthRate, int years) {

if (years == 0) {

return currentValue;

}

return forecast(currentValue \* (1 + growthRate), growthRate, years - 1);

}

public static double forecastOptimized(double currentValue, double growthRate, int years) {

return currentValue \* power(1 + growthRate, years);

}

private static double power(double base, int exponent) {

if (exponent == 0) return 1;

double half = power(base, exponent / 2);

if (exponent % 2 == 0) return half \* half;

return base \* half \* half;

}

}

**ForecastTest.java:**

public class ForecastTest {

public static void main(String[] args) {

double currentValue = 10000;

double growthRate = 0.08;

int years = 5;

double futureValue = FinancialForecast.forecast(currentValue, growthRate, years);

System.out.printf("Recursive Forecast (%.0f at %.2f%% for %d years): %.2f%n",

currentValue, growthRate \* 100, years, futureValue);

double optimizedValue = FinancialForecast.forecastOptimized(currentValue, growthRate, years);

System.out.printf("Optimized Forecast: %.2f%n", optimizedValue);

}

}

**OUTPUT:**

