**WEEK-1**

(Implemented in Eclipse IDE )

**2)Data structures and Algorithms**

Exercise 7: Financial Forecasting:

**RecursiveFinancialForecast.java**

**package** com.financial.forecast;

**public** **class** RecursiveFinancialForecast {

//O(N)

**public** **static** **double** calculateFutureValue(**double** initialValue, **double** growthRate, **int** years) {

**if** (years == 0) {

**return** initialValue;

}

**return** *calculateFutureValue*(initialValue \* (1 + growthRate), growthRate, years - 1);

}

**public** **static** **void** main(String[] args) {

**double** initialValue = 1000.0;

**double** growthRate = 0.05;

**int** years = 10;

**double** futureValue = *calculateFutureValue*(initialValue, growthRate, years);

System.***out***.printf("Future Value after %d years: %.2f%n", years, futureValue);

}

}

**OptimizedFinancialForecast.java**

**package** com.financial.forecast;

**public** **class** OptimizedFinancialForecast {

//Iterative-O(N)

**public** **static** **double** calculateFutureValueIterative(**double** initialValue, **double** growthRate, **int** years) {

**double** result = initialValue;

**for** (**int** i = 0; i < years; i++) {

result \*= (1 + growthRate);

}

**return** result;

}

**public** **static** **double** calculateFutureValueFormula(**double** initialValue, **double** growthRate, **int** years) {

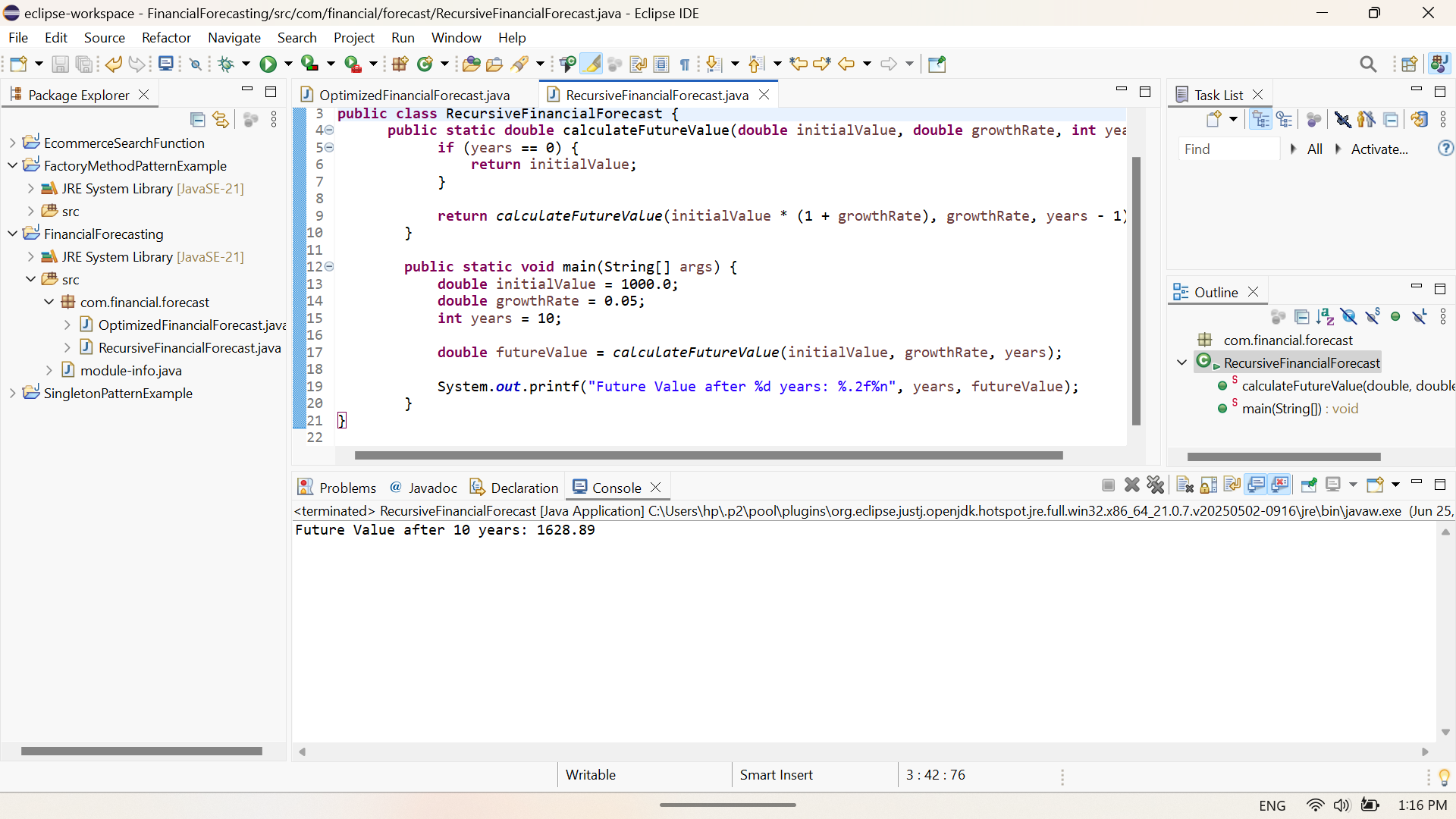
//Formula-O(1)

**return** initialValue \* Math.*pow*(1 + growthRate, years);

}

}

**Output:**

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