Lab – Java – Lambdas and Streams

Overview

Write an application that uses lambda expressions and streams.

Create Console Application

Create a new Java console application.

Create a Functional Interface

Create a functional interface named Taxes. There should be one method that takes two double parameters (gross pay and tax percentage). It should return a double.

Create and Use a Functional Interface Variable

Declare an instance of the Taxes functional interface. Assign to the variable a lambda expression that calculates the net pay from the parameters (assume the tax percentage is a decimal between 0 and 1).

Call the lambda expression using the variable and print the result on screen. Here is the result if gross is 100 and tax percent .3:

Net Pay: $70.00

Create an Assignment Class

Create an Assignment class that stores the name and numeric grade (as an int). Member variables should be private. Write get/set methods for all member variables.

Create a List of Assignment

Create a List of Assignment from the following data:
Homework 1, 85
Homework 2, 80
Homework 1, 100
Exam 1, 75
Exam 2, 90

Create a Stream of Assignment

Create a Java stream from the Assignment list. Print the assignment name and grade for each element on screen.

Stream - Grades

Modify the stream to only show the grades. Use map to do this.

Stream – Only Show High Grades

Modify the stream to grades that are 90 or above.

Stream – Letter Grades

Modify the stream to show letter grades for all assignments. Here are the grade ranges:
A is 90 or above
B is 80 to 89
C is 70 to 79
D is 60 to 69
F is below 60

Stream – Average

Create a stream that will generate an average grade for all assignments. Show the average on screen. Hint: You need to convert elements to primitive double as part of the pipeline for this stream.

Stream – Average with Curve

Create a stream that will generate an average where each assignment grade is being given an extra 5 points. Show the average on screen. Hint: You need to convert elements to primitive double as part of the pipeline for this stream.

Stream – Show Assignment Names in Order

Create a stream that will display assignment names in order.

Stream – Create a Sorted List of Assignment Names

Use a stream to create a sorted list (an instance of List) of assignment names. Print the names from the generated List collection. Sorting should be done on the stream (not the List collection).