Course: CSC230

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Write detailed pseudo code for a program that is designed to organize a family's tax payments for the past 20 years. The program should accomplish the following tasks:

* ***Prompt the user for the tax amount and also the year.***
* ***Use appropriate data structure to store the tax amount and the year.***
* ***Use a linear search algorithm to determine which year the family paid the highest tax, and display the result.***
* ***Calculate the average amount of tax paid over the years, and display the result.***

After you are done, submit the pseudo code to the dropbox.

Obviously, there are several ways to handle this. The most obvious, to me, is using a TreeMap<Integer, Integer> because, the data can be key, value paired by the year and the tax amount; however, this module seems to be discussing ArrayLists, Vectors, and LinkedLists – I could use Nodes and Linked Lists with each Node having 2 pointers. One pointer points to the next Node and the other pointer Points to an Obj that contains the data; in this case, taxAmount and year…. ArrayLists is what I’ll choose. I’ll create a Tax Obj to, create, store user data, and insert into the ArrayList. Then, I can iterate through the arrayList. Note, this is not the most efficient approach and there are assumptions about this assignment.

Assumptions:

* All data is correct, accurate, and in-order. For example, there are no negative years being added.
* All values are of type int – positive whole numbers
* Data will be added for all 20 years

Note: An Insertion Sorting Algorithm is not used because there is a finite and small number of total iterations to search for the highest value of the taxed Amount in a given year.

//Design a class to encapsulate two int values

class Tax{

private data members:

int taxAmount;

int year;

Constructor

Tax(){this.taxAmount = 0; this.year = 0;}

Accessors/Mutators

Int getTaxAmount(); returns taxAmount

Int getYear(); returns year //the taxable year

} //ends Tax class definition

new ArrayList<Tax>() //creates ArrayList to store user input/tax data

//Load ArrayList with Tax objs to store user data

LOOP 20 Iterations {arr.add(new Tax()};

Create a Scanner Obj to Iterate over the console

LOOP 20 Iterations //Create a Loop to ask the User to enter the 20 years’ worth of tax amounts

{

Sys.out.PL(“Please enter the tax amount and the year with a space between them: “);

//i is the incrementor

TaxObjAtIndex(i).taxAmount.add() = read nextInt() from console and store it to Tax objs backing Field;

TaxObjAtIndex(i).year.add() = read nextInt() from console and store it to Tax objs backing Field;

}

//Search for the highest tax year

Int highest = firstIndexOfArrayList.year;

Loop 19 Iterations // don’t need to compare the first because, it’s already set to the highest

{

If(currentYear’s tax value is greater than highest} set highest to the current year;

}

//Display resultant of the highest year for tax

Sys.out.PL(“The highest tax year was: “ + highest);

//Calculate the average taxes over the years

Int total = 0;

Loop through ArrayList //size()

{

total += currentTax.getTaxAmount();

}

Sys.out.PL(“The average taxes paid were: “ (total / 20));