Name: Haichuan Wei

Lab: Lab 2

Date: 9/19/2021

Program Description:

This program manipulates a vector strut and takes two user defined variables 3 times. It will ask for Income and tax rate then multiply them together and divide by 100 which calculates tax. The purpose of this file is to practice using C++ Vector and Make file

Program Source Code:

vectorstructTax.cpp

vectorstructTax.cpp > main()

```cpp
// @return- The total tax for each person given by the user.
//
#include <iostream>
#include <vector>
#include <iomanip>
#include "printMeFirst.h"
using namespace std;

struct taxPayer
{
    float taxRate;
    float income;
    float taxes;
};

int main()
{
    vector<taxPayer *> taxPayerList;
    printMeFirst("Haichuan Wei ", "CS-116 Vector");
    cout << fixed << showpoint << setprecision(2);
    cout << "Please enter the annual income and tax rate for 3 tax payers: " << endl;
    cout << endl
         << endl;
    //asks the user to enter income and tax rate for 3 tax payers:
    for (int count = 0; count < 3; count++)
    {
        // create a new pointer to a taxPayer struct
        taxPayer *newTaxPayerList = new taxPayer;
        cout << "Tax payer " << count + 1 << ": " << endl;
        cout << "Enter this year's income for tax payer " << (count + 1) << ": ";
        cin >> newTaxPayerList->income;
        cout << "Enter the tax rate for tax payer # " << (count + 1) << ": ";
        cin >> newTaxPayerList->taxRate;
        newTaxPayerList->taxes = newTaxPayerList->income * newTaxPayerList->taxRate / 100;
        taxPayerList.push_back(newTaxPayerList);
    }
    //displays everything
    cout << "\tTaxes due for this year: " << endl
         << endl;
    for (int index = 0; index < 3; index++)
    {
        cout << "Tax payer " << index + 1 << ": " << endl;
        cout << "\tIncome: $" << taxPayerList[index]->income << endl;
        cout << "\tTax rate: " << taxPayerList[index]->taxRate << "%" << endl;
        cout << "\tTaxes due: $" << taxPayerList[index]->taxes << endl;
    };
    return 0;
}
```

printMeFirst.cpp

```cpp
#include "printMeFirst.h"
#include <string>
#include <iostream>
#include <iomanip>
#include <ctime>
using namespace std;

/*
Purpose- Prints the information of the developer.
@author Haichuan Wei
@version 1.0 9/2/21
@using  CLion
@param name - none
@param courseInfo - CS-116 OOP C++
@return-
*/

void printMeFirst(string name, string courseInfo)
{
    cout << "Program written by: " << name << endl;
    cout << "Course Info: " << courseInfo << endl;
    time_t now = time(0);
    char *dt = ctime(&now);
    cout << "Date: " << dt << endl;
}
```

Program Output:

After inputting all the test cases giving in in the instructions, my output matched up to the test case.

```
arthur@DESKTOP-UP5LF24:/mnt/c/Users/Arthur/Documents/Github/Cpp_Projects/Intermediate C++/Lab 2$ make all
g++ -c -Wall   vectorstructTax.cpp
g++ vectorstructTax.o printMeFirst.o  -o vectorstructTax
arthur@DESKTOP-UP5LF24:/mnt/c/Users/Arthur/Documents/Github/Cpp_Projects/Intermediate C++/Lab 2$ make run
./vectorstructTax
Program written by: Haichuan Wei
Course Info: CS-116 Vector
Date: Sun Sep 19 16:10:48 2021

Please enter the annual income and tax rate for 3 tax payers:


Tax payer 1:
Enter this year's income for tax payer 1: 100000
Enter the tax rate for tax payer # 1: 12.5
Tax payer 2:
Enter this year's income for tax payer 2: 150000
Enter the tax rate for tax payer # 2: 17.85
Tax payer 3:
Enter this year's income for tax payer 3: 250000
Enter the tax rate for tax payer # 3: 22
        Taxes due for this year:

Tax payer 1:
        Income: $100000.00
        Tax rate: 12.50%
        Taxes due: $12500.00
Tax payer 2:
        Income: $150000.00
        Tax rate: 17.85%
        Taxes due: $26775.00
Tax payer 3:
        Income: $250000.00
        Tax rate: 22.00%
        Taxes due: $55000.00
arthur@DESKTOP-UP5LF24:/mnt/c/Users/Arthur/Documents/Github/Cpp_Projects/Intermediate C++/Lab 2$
```