```java
// Lab05
// The Federal Tax Rate Program
import java.util.Scanner;

public class FederalTaxRate
{
        public static void main(String args[])
        {
                // Construct a Scanner for user input
                Scanner input = new Scanner(System.in);

                System.out.println("Which marital status best describes you: Married or Single?");
                String inputtedMaritalStatus = input.nextLine();

                String letterStatus = inputtedMaritalStatus.substring(0, 1).toLowerCase();

                System.out.println("What is your annual income?");
                double income = input.nextDouble();

                input.close();

                double tax = calculateTax(letterStatus, income);

                if (tax != -1)
                {
        System.out.print("You must pay " + tax + " in federal income taxes.");
    }
                else
                {
                        System.out.print("Invalid input.");
                        //i put this line of code because, if the user inputs some value that causes
an invalid tax value (like a negative number as the income, for example),
                        //then the program will display this error message instead of printing the
incorrect tax value.
                }

        }

        /**
         * Calculate the federal tax based on a given marital status and yearly income (USD)
         * @param maritalStatus "s" for single, or "m" for married
         * @param income the yearly income in USD
         * @return the amount of federal tax in USD or -1 if an error occurred
         */
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public static double calculateTax(String maritalStatus, double income)
{
        double tax = 0.0;
        // Check for negative income
        if (income < 0) return -1; // Decide on a sentinel value; I'll use -1
        if (maritalStatus.equals("s"))
        {
                // Assign the variable tax according to Schedule X
                if(income >= 0 && income < 11600)
                {
                        tax = (income*0.10);
                }
                else if(income >= 11600 && income < 47150)
                {
                        tax = ((income-11600)*0.12)+1160;
                }
                else if(income >= 47150 && income < 100525)
                {
                        tax = ((income-47150)*0.22)+5426;
                }
                else if(income >= 100525 && income < 191950)
                {
                        tax = ((income-100525)*0.24)+17168.50;
                }
                else if(income >= 191950 && income < 243725)
                {
                        tax = ((income-191950)*0.32)+39110.50;
                }
                else if(income >= 243725 && income < 609350)
                {
                        tax = ((income-243725)*0.35)+55678.50;
                }
                else
                {
                        tax = ((income-609350)*0.37)+183647.25;
                }
        }
        else if (maritalStatus.equals("m"))
        {
                // Assign the variable tax according to Schedule Y-1
                if(income >= 0 && income < 23200)
                {
                        tax = (income*0.10);
                }
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                        else if(income >= 23200 && income < 94300)
                        {
                                tax = ((income-23200)*0.12)+2320;
                        }
                        else if(income >= 94300 && income < 201050)
                        {
                                tax = ((income-94300)*0.22)+10852;
                        }
                        else if(income >= 201050 && income < 383900)
                        {
                                tax = ((income-201050)*0.24)+34337;
                        }
                        else if(income >= 383900 && income < 487450)
                        {
                                tax = ((income-383900)*0.32)+78221;
                        }
                        else if(income >= 487450 && income < 731200)
                        {
                                tax = ((income-487450)*0.35)+111357;
                        }
                        else
                        {
                                tax = ((income-731200)*0.37)+196669.50;
                        }
                }
                else
                {
                        System.out.println("ERROR: No tax table found.");
                        return -1; // Decide on a sentinel value; I'll use -1
                }

                // Round tax to the nearest penny and return the value of tax
                return Math.round(tax * 100.0) / 100.0;
        }
}
```