

Project Definition

Design a program that will estimate the amount of federal tax due. The estimated tax due is to be computed based on information in tax tables that are stored in arrays.

DISCLAIMER: This program only provides an estimate of tax due. It is not to be used when completing a tax return. Consult the official tax documents from the IRS or a tax professional.

What is NOT Included !!!

Exemptions phase out at higher income levels

Business gains or losses

Moving Expenses

Early withdrawal penalties

IRA deductions

Student loan interest deductions

Child and dependent care

Earned Income Credit (EIC)

Residential Energy Credit

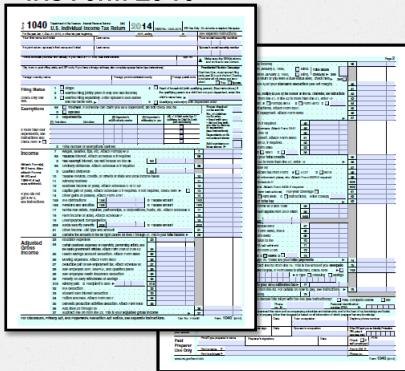
.. and many more deductions and other taxes

Tax Estimator Program

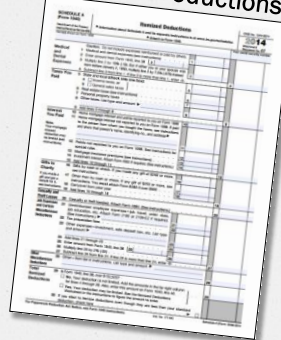
1. Project Description
2. Analysis
3. Design
4. Code the Solution
5. Test & Debug
6. Documentation (Lab Report)

Project Description

IRS Form 1040

The image shows a digital representation of the IRS Form 1040, the U.S. Individual Income Tax Return. It is a complex form with multiple sections, including 'Personal Information', 'Filing Status', 'Income', 'Deductions and Exemptions', and 'Taxes'. The form is presented as a stack of three overlapping pages, with the top page being the most prominent.

Schedule A
Itemized Deductions

The image shows a digital representation of Schedule A (Form 1040), titled 'Itemized Deductions'. It is a form used to report various types of deductions, such as state and local taxes, mortgage interest, and charitable contributions. The form is presented as a single page with a grid-like structure for entering data.

How Taxes Are Computed

- 1) Taxes are computed on a graduated scale. People who make more money pay taxes at a higher rate than people who make less money.
- 2) The amount of income that is taxed is reduced by taking the total income and subtracting exemptions and deductions. This is called **Taxable Income**.

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How Taxes Are Computed

- 3) People can either take a standard deduction or itemize their deductions.
- 4) The tax is computed using **Tax Tables**. There are seven tax brackets based on income starting at 10% and going up to 39.6%.
- 5) If enough money is withheld from your paycheck during the year, you will get a refund, otherwise you have taxes due.

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Exemptions

You can claim an exemption for yourself, one for a spouse if filing a joint return and one for each dependent. The amount for exemption for each person in 2015 is projected at \$4000. This is subtracted from your total income when computing the taxable income.

Exemptions start to phase out at higher income levels, but will not be included in this program.

Project Description

Five selections of
Taxpayer Status

Taxpayer Status
Single
Married filing Jointly
Married Filing Separately
Head of Household
Qualifying Widow(er)

Seven Graduated
Tax Brackets

Tax Bracket
10.0%
15.0%
25.0%
28.0%
33.0%
35.0%
39.6%

Deductions

Taxpayers can choose to either **Itemize** deductions or take the Standard deduction based on their filing status which ever is best to their advantage.

For some taxpayers it is better to itemize the deductions using the 1040 Schedule A and reduce the taxable income by deducting some medical expenses, state and local taxes, mortgage interest, donations and other expenses.

Deductions ????

The code provided for the lab exercise is missing the standard deduction. It is part of your project to determine where in the program is the proper place to implement the standard deduction.

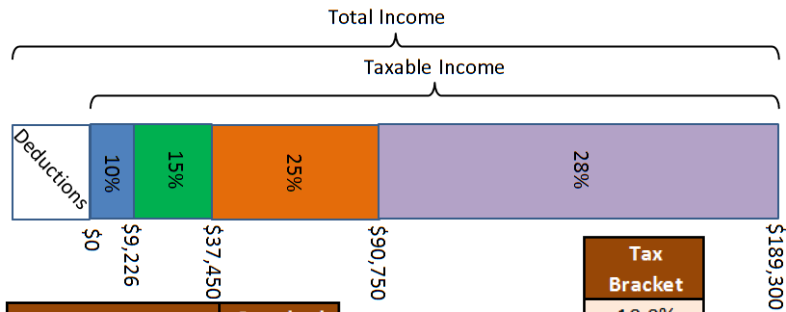
Taxpayer Status	Standard Deduction
Single	6300.00
Married filing Jointly	12600.00
Married Filing Separat	6300.00
Head of Household	9250.00
Qualifying Widow(er)	12600.00

Project Description

Single

Taxable Income	Tax Rate
\$0 to \$9,225	10%
\$9,226 to \$37,450	\$922.50 plus 15% of the amount over \$9,225
\$37,451 to \$90,750	\$5,156.25 plus 25% of the amount over \$37,450
\$90,751 to \$189,300	\$18,481.25 plus 28% of the amount over \$90,750
\$189,301 to \$411,500	\$46,075.25 plus 33% of the amount over \$189,300
\$411,501 to \$413,200	\$119,401.25 plus 35% of the amount over \$411,500
\$413,201 or more	\$119,996.25 plus 39.6% of the amount over \$413,200

Project Description



Taxpayer Status	Standard Deduction
Single	6300.00
Married filing Jointly	12600.00
Married Filing Separat	6300.00
Head of Household	9250.00
Qualifying Widow(er)	12600.00

These tax bracket values are for 2015 filing Single

Tax Bracket
10.0%
15.0%
25.0%
28.0%
33.0%
35.0%
39.6%

Project Description

Single

Taxable Income	Tax Rate
\$0 to \$9,225	10%
\$9,226 to \$37,450	\$922.50 plus 15% of the amount over \$9,225
\$37,451 to \$90,750	\$5,156.25 plus 25% of the amount over \$37,450
\$90,751 to \$189,300	\$18,481.25 plus 28% of the amount over \$90,750
\$189,301 to \$411,500	\$46,075.25 plus 33% of the amount over \$189,300
\$411,501 to \$413,200	\$119,401.25 plus 35% of the amount over \$411,500
\$413,201 or more	\$119,996.25 plus 39.6% of the amount over \$413,200

Married Filing Separately:

Taxable Income	Tax Rate
\$0 to \$9,225	10%
\$9,226 to \$37,450	\$922.50 plus 15% of the amount over \$9,225
\$37,451 to \$75,600	\$5,156.25 plus 25% of the amount over \$37,450
\$75,601 to \$115,225	\$14,693.75 plus 28% of the amount over \$75,600
\$115,226 to \$205,750	\$25,788.75 plus 33% of the amount over \$115,225
\$205,751 to \$232,425	\$55,662.00 plus 35% of the amount over \$205,750
\$232,426 or more	\$64,998.25 plus 39.6% of the amount over \$232,425

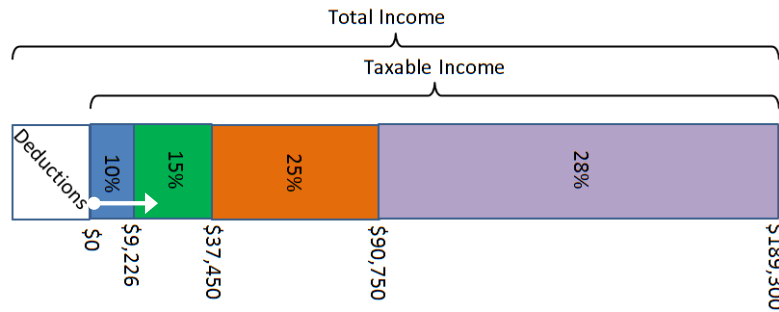
Married Filing Jointly or Qualifying Widow(er):

Taxable Income	Tax Rate
\$0 to \$18,450	10%
\$18,451 to \$74,900	\$1,845.00 plus 15% of the amount over \$18,450
\$74,901 to \$151,200	\$10,312.50 plus 25% of the amount over \$74,900
\$151,201 to \$230,450	\$29,387.50 plus 28% of the amount over \$151,200
\$230,451 to \$411,500	\$51,577.50 plus 33% of the amount over \$230,450
\$411,501 to \$464,850	\$111,324.00 plus 35% of the amount over \$411,500
\$464,851 or more	\$129,996.50 plus 39.6% of the amount over \$464,850

Head of Household:

Taxable Income	Tax Rate
\$0 to \$13,150	10%
\$13,151 to \$50,200	\$1,315.00 plus 15% of the amount over \$13,150
\$50,201 to \$129,600	\$6,872.50 plus 25% of the amount over \$50,200
\$129,601 to \$209,850	\$26,772.50 plus 28% of the amount over \$129,600
\$209,851 to \$411,500	\$49,192.50 plus 33% of the amount over \$209,850
\$411,501 to \$439,000	\$115,737.00 plus 35% of the amount over \$411,500
\$439,001 or more	\$125,362.00 plus 39.6% of the amount over \$439,000

Tax Computation



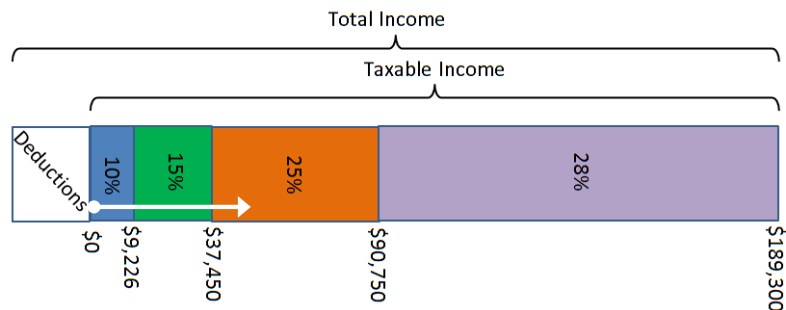
If the **Taxable Income** is \$10,000 then the tax is:

$$\begin{aligned}
 & 922.50 + 15\% \text{ of anything over } 9225 \\
 = & 922.50 + (10000 - 9225) * 0.15 \\
 = & 1038.75
 \end{aligned}$$

Single

Taxable Income	Tax Rate
\$0 to \$9,225	10%
\$9,226 to \$37,450	\$922.50 plus 15% of the amount over \$9,225
\$37,451 to \$90,750	\$5,156.25 plus 25% of the amount over \$37,450
\$90,751 to \$189,300	\$18,481.25 plus 28% of the amount over \$90,750

Tax Computation



If the **TaxableIncome** is \$40,000 then the tax is:

$$5156.25 + 25\% \text{ of anything over } 37450$$

$$= 5156.25 + (40000 - 37450) * 0.25$$

$$= 5793.75$$

Single

Taxable Income	Tax Rate
\$0 to \$9,225	10%
\$9,226 to \$37,450	\$922.50 plus 15% of the amount over \$9,225
\$37,451 to \$90,750	\$5,156.25 plus 25% of the amount over \$37,450
\$90,751 to \$189,300	\$19,481.25 plus 28% of the amount over \$90,750



Project Design

```

C:\Users\Dan\Documents\00-CourseDevelopment\C++\C++TaxEstimator\C++TaxEstimator\...
2015 FEDERAL TAX ESTIMATOR
For information purposes only

=====
Enter your tax status:
1 = Single
2 = Married filing jointly
3 = Married filing separately
4 = Head of Household
5 = Qualifying widow(er)
6 = END THE PROGRAM
> 1
Enter the number of exemptions: (you + dependants): 3
Enter your total income: 42000
Select 1=Standard deductions, or 2=Itemized deductions: 1
Enter the amount withheld: 2137

Income:          42000.00
Exemptions:     -12000.00
Deductions:     -12600.00
-----
Taxable Income: 17400.00

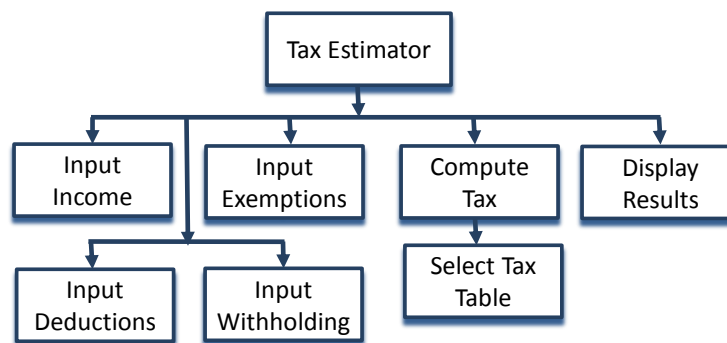
Tax Estimate:   1740.00
Withholding:    2137.00
Estimated refund: 397.00
  
```

Project Analysis

HIPO Chart

INPUTS	PROCESSING	OUTPUTS
Tax Status	\$\$ Exemptions	Income
# of Exemptions	\$\$ Deductions	\$\$ Exemptions
Total Income	Taxable Income	\$\$ Deductions
Deductions	Tax Estimate	Taxable Income
\$\$ Withholding	Refund or \$\$ Due	Tax Estimate
		Refund or \$\$ Due

Project Design



Code the Solution

Single

Taxable Income	Tax Rate
\$0 to \$9,225	10%
\$9,226 to \$37,450	\$922.50 plus 15% of the amount over \$9,225
\$37,451 to \$90,750	\$5,156.25 plus 25% of the amount over \$37,450
\$90,751 to \$189,300	\$18,481.25 plus 28% of the amount over \$90,750
\$189,301 to \$411,500	\$46,075.25 plus 33% of the amount over \$189,300
\$411,501 to \$413,200	\$119,401.25 plus 35% of the amount over \$411,500
\$413,201 or more	\$119,996.25 plus 39.6% of the amount over \$413,200

Single

From	To	Tax	Plus
0.00	9225.00	0.00	10.0%
9226.00	37450.00	922.50	15.0%
37451.00	90750.00	5156.25	25.0%
90751.00	189300.00	18481.25	28.0%
189301.00	411500.00	46075.25	33.0%
411501.00	413200.00	119401.25	35.0%
413201.00		119996.25	39.6%

Code the Solution

Single

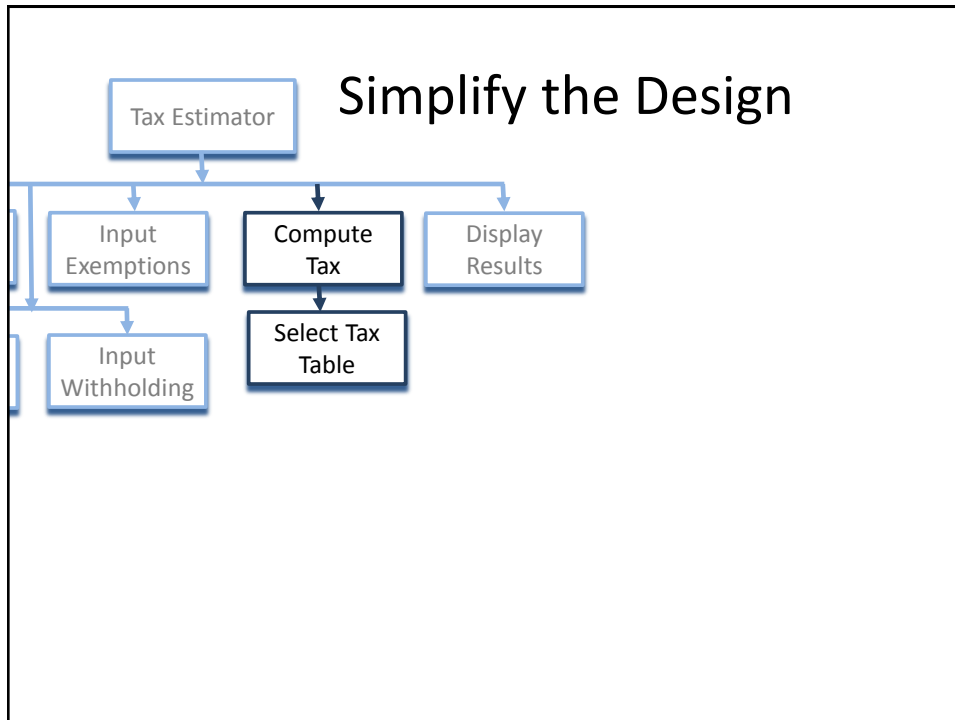
Taxable Income	Tax Rate
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\$37,451 to \$90,750	\$5,156.25 plus 25% of the amount over \$37,450
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\$189,301 to \$411,500	\$46,075.25 plus 33% of the amount over \$189,300
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Single

From	To	Tax	Plus
0.00	9225.00	0.00	10.0%
9226.00	37450.00	922.50	15.0%
37451.00	90750.00	5156.25	25.0%
90751.00	189300.00	18481.25	28.0%
189301.00	411500.00	46075.25	33.0%
411501.00	413200.00	119401.25	35.0%
413201.00		119996.25	39.6%

```
struct taxTable {
    double from;
    double to;
    double tax;
    double percent;
};
```

```
const double maxDouble = numeric_limits<double>::max();
//from to tax percent
static taxTable SingleTaxTable[] = {
    {0.00, 9225.00, 0.00, 10.0},
    {9226.00, 37450.00, 922.50, 15.0},
    {37451.00, 90750.00, 5156.25, 25.0},
    {90751.00, 189300.00, 18481.25, 28.0},
    {189301.00, 411500.00, 46075.25, 33.0},
    {411501.00, 413200.00, 119401.25, 35.0},
    {413201.00, maxDouble, 119996.25, 39.6}
};
```



```

1 // C++TaxEstimator.cpp : Defines the entry point for the console application.
2 //
3
4 #include "stdafx.h"
5 #include <iostream>
6 #include <iomanip>
7 using namespace std;
8
9 static enum taxStatus {
10     Single = 1,
11     MarriedFilingJointly,
12     MarriedFilingSeparately,
13     HeadOfHousehold,
14     QualifyingWidow // or Widower
15 };
16 struct taxTable {
17     double from;
18     double to;
19     double tax;
20     double percent;
21 };
22 const double exemptionRate = 4000.00;
23 const int bracketCount = 7;
24 int inputStatus();
25 int inputExemptions();
26 double inputIncome();
27 double inputDeductions(int);
28 double standardDeduction(int);
29 double computedTax(int, double taxableIncome);
30 taxTable *tableSelection(int);
31
  
```

```

32 int main(int argc, char* argv[])
33 {
34     int status;
35     double totalIncome;
36     int exemptions;
37     double deductions;
38     double taxableIncome;
39     double tax;
40     double withholding;
41     double refundOrTaxDue;
42
43     cout << "2015 FEDERAL TAX ESTIMATOR" << endl;
44     cout << "For information purposes only" << endl << endl;
45     do
46     {
47         // input the data
48         status = inputStatus();
49         if (status == 0) break; // end the program
50
51         exemptions = inputExemptions();
52         totalIncome = inputIncome();
53         deductions = inputDeductions(status);
54
55         cout << "Enter the amount withheld: ";
56         cin >> withholding;
57
58         // compute the tax
59         taxableIncome = totalIncome - exemptions*exemptionRate - deductions;
60         if (taxableIncome < 0)
61             taxableIncome = 0;
62         tax = computedTax ((taxStatus)status, taxableIncome);
63         refundOrTaxDue = withholding - tax;
64

```

```

64
65     // display the results
66     cout << setiosflags(ios::fixed | ios::showpoint) << endl;
67     cout << setprecision(2);
68     cout << endl;
69     cout << "Income:          " << setw(9) << totalIncome << endl;
70     cout << "Exemptions:       " << setw(9) << -exemptions * exemptionRate << endl;
71     cout << "Deductions:      " << setw(9) << -deductions << endl;
72     cout << "-----" << endl;
73     cout << "Taxable Income:  " << setw(9) << taxableIncome << endl << endl;
74     cout << "Tax Estimate:    " << setw(9) << tax << endl;
75     cout << "Withholding:     " << setw(9) << withholding << endl;
76     if (refundOrTaxDue >= 0)
77         cout << "Estimated refund:" << setw(9) << refundOrTaxDue << endl;
78     else
79         cout << "Please pay:       " << setw(9) << -refundOrTaxDue << endl;
80     cout << endl;
81 } while (status >= 1 && status <= 5);
82 return 0;
83 }
84

```

```

85  //input taxpayer status (0-5) //
86  int inputStatus()
87  {
88      int status;
89
90      do {
91          cout << "===== " << endl;
92          cout << "Enter your tax status:" << endl
93              << "1 = Single" << endl
94              << "2 = Married filing jointly" << endl
95              << "3 = Married filing separately" << endl
96              << "4 = Head of Household" << endl
97              << "5 = Qualifying widow(er)" << endl
98              << "0 = END THE PROGRAM" << endl
99              << "> ";
100         cin >> status;
101         if (status < 0 || status > 5)
102             cout << "Illegal value, try again" << endl;
103     } while (status < 0 || status > 5);
104     return status;
105 }
106
107 //input exemptions //
108 int inputExemptions()
109 {
110     int exemptions;
111     cout << "Enter the number of exemptions: (you + dependants): ";
112     cin >> exemptions;
113     return exemptions;
114 }
115

```

```

116 //input income //
117 double inputIncome()
118 {
119     double income;
120     cout << "Enter your total income: ";
121     cin >> income;
122     return income;
123 }
124
125 //input deductions //
126 double inputDeductions(int s)
127 {
128     double deductions;
129     cout << "Enter the amount of your Itemized Deductions: ";
130     cin >> deductions;
131     return deductions;
132 }
133
134

```

```

135 taxTable *tableSelection (int s)
136 {
137     const double maxDouble = numeric_limits<double>::max();
138     //from    to    tax    percent
139     static taxTable SingleTaxTable[] = {
140         {0.00, 9225.00, 0.00, 10.0},
141         {9225.00, 37450.00, 922.50, 15.0},
142         {37450.00, 90750.00, 5156.25, 25.0},
143         {90750.00, 189300.00, 18481.25, 28.0},
144         {189300.00, 411500.00, 46075.25, 33.0},
145         {411500.00, 413200.00, 119401.25, 35.0},
146         {413200.00, maxDouble, 119996.25, 39.6}
147     };
148     static taxTable MarriedFilingJointlyTaxTable[] = {
149         {0.00, 18450.00, 0.00, 10.0},
150         {18450.00, 74900.00, 1845.00, 15.0},
151         {74900.00, 151200.00, 10312.50, 25.0},
152         {151200.00, 230450.00, 29387.50, 28.0},
153         {230450.00, 411500.00, 51577.50, 33.0},
154         {411500.00, 464850.00, 111324.00, 35.0},
155         {464850.00, maxDouble, 129996.50, 39.6}
156     };
157     static taxTable MarriedFilingSeparatelyTaxTable[] = {
158         {0.00, 9225.00, 0.00, 10.0},
159         {9225.00, 37450.00, 922.50, 15.0},
160         {37450.00, 75600.00, 5156.25, 25.0},
161         {75600.00, 115225.00, 14693.75, 28.0},
162         {115225.00, 205750.00, 25788.75, 33.0},
163         {205750.00, 232425.00, 55662.00, 35.0},
164         {232425.00, maxDouble, 64998.25, 39.6}
165     };

```

```

166     static taxTable HeadOfHouseholdTaxTable[] = {
167         {0.00, 13150.00, 0.00, 10.0},
168         {13150.00, 50200.00, 1315.00, 15.0},
169         {50200.00, 129600.00, 6872.50, 25.0},
170         {129600.00, 209850.00, 26772.50, 28.0},
171         {209850.00, 411500.00, 49192.50, 33.0},
172         {411500.00, 439000.00, 115737.00, 35.0},
173         {439000.00, maxDouble, 125362.00, 39.6}
174     };
175     static taxTable QualifyingWidowTaxTable[] = {
176         {0.00, 18450.00, 0.00, 10.0},
177         {18450.00, 74900.00, 1845.00, 15.0},
178         {74900.00, 151200.00, 10312.50, 25.0},
179         {151200.00, 230450.00, 29387.50, 28.0},
180         {230450.00, 411500.00, 51577.50, 33.0},
181         {411500.00, 464850.00, 111324.00, 35.0},
182         {464850.00, maxDouble, 129996.50, 39.6}
183     };
184     switch (s) {
185     case Single: return SingleTaxTable;
186     case MarriedFilingJointly: return MarriedFilingJointlyTaxTable;
187     case MarriedFilingSeparately: return MarriedFilingSeparatelyTaxTable;
188     case HeadOfHousehold: return HeadOfHouseholdTaxTable;
189     case QualifyingWidow: return QualifyingWidowTaxTable;
190     default: return NULL;
191     };
192     return NULL;
193 }

```

```
194 double computedTax (int s, double taxableIncome)
195 {
196     taxTable *table = tableSelection(s);
197     double baseTax;
198     double tax=0.0;
199     // find the entry in the tax table
200     for (int i=0; i<bracketCount; i++)
201     {
202         if (taxableIncome>table[i].from && taxableIncome<=table[i].to)
203         {
204             baseTax = table[i].tax;
205             tax = baseTax + (taxableIncome - table[i].from)*table[i].percent/100.0;
206         }
207     }
208     return tax;
209 }
```