

CS 100 Project Two – Spring 2019

Project Overview: In this project, you will use your knowledge (assignment, selection, printf and scanf) to implement a simplified version of 2018 Alabama income tax computation. (The actual 2018 Alabama income tax return form can be found at <https://revenue.alabama.gov/wp-content/uploads/2019/01/18f40blk.pdf> and the instructions book can be found at <https://revenue.alabama.gov/wp-content/uploads/2019/01/18f40bk.pdf> if you are interested.) It is a simplified version because it does not compute the adjusted gross income or the amount of itemized deductions. The program will first prompt the user for the following five pieces of information.

- **Filing status:** an integer from 1 through 4 as shown below. If the user enters a number other than 1 through 4, the program prints out an error message and returns.
 1. Single
 2. Married filing jointly
 3. Married filing separately
 4. Head of family
- **Number of dependents:** a non-negative integer. If the user enters a negative integer, the program will reset it to 0.
- **Adjusted gross income:** a non-negative integer. If the user enters a negative integer, the program will reset it to 0. From now on, we refer to **adjusted gross income** simply as **income**.
- **Itemized deduction:** a non-negative integer. If the user enters a negative integer, the program will reset it to 0. The program will compare the itemized deduction with the standard deduction (to be explained later), and use the larger one to deduct. If the user chooses to use the standard deduction, the user just needs to enter 0 for the itemized deduction.
- **Federal tax deduction:** a non-negative integer. If the user enters a negative integer, the program will reset it to 0.

The program will then compute the standard deduction, and use the standard deduction computed or the itemized deduction entered, whichever is larger. The **standard deduction** table is shown below.

Standard Deduction							
Married Filing Joint		Married Filing Separate		Head of Family		Single	
AL Adjusted Gross Income (AL Line 10)	Standard Deduction	AL Adjusted Gross Income (AL Line 10)	Standard Deduction	AL Adjusted Gross Income (AL Line 10)	Standard Deduction	AL Adjusted Gross Income (AL Line 10)	Standard Deduction
0 – 20,499	7,500	0 – 10,249	3,750	0 – 20,499	4,700	0 – 20,499	2,500
20,500 – 20,999	7,325	10,250 – 10,499	3,662	20,500 – 20,999	4,565	20,500 – 20,999	2,475
21,000 – 21,499	7,150	10,500 – 10,749	3,574	21,000 – 21,499	4,430	21,000 – 21,499	2,450
21,500 – 21,999	6,975	10,750 – 10,999	3,486	21,500 – 21,999	4,295	21,500 – 21,999	2,425
22,000 – 22,499	6,800	11,000 – 11,249	3,398	22,000 – 22,499	4,160	22,000 – 22,499	2,400
22,500 – 22,999	6,625	11,250 – 11,499	3,310	22,500 – 22,999	4,025	22,500 – 22,999	2,375
23,000 – 23,499	6,450	11,500 – 11,749	3,222	23,000 – 23,499	3,890	23,000 – 23,499	2,350
23,500 – 23,999	6,275	11,750 – 11,999	3,134	23,500 – 23,999	3,755	23,500 – 23,999	2,325
24,000 – 24,499	6,100	12,000 – 12,249	3,046	24,000 – 24,499	3,620	24,000 – 24,499	2,300
24,500 – 24,999	5,925	12,250 – 12,499	2,958	24,500 – 24,999	3,485	24,500 – 24,999	2,275
25,000 – 25,499	5,750	12,500 – 12,749	2,870	25,000 – 25,499	3,350	25,000 – 25,499	2,250
25,500 – 25,999	5,575	12,750 – 12,999	2,782	25,500 – 25,999	3,215	25,500 – 25,999	2,225
26,000 – 26,499	5,400	13,000 – 13,249	2,694	26,000 – 26,499	3,080	26,000 – 26,499	2,200
26,500 – 26,999	5,225	13,250 – 13,499	2,606	26,500 – 26,999	2,945	26,500 – 26,999	2,175
27,000 – 27,499	5,050	13,500 – 13,749	2,518	27,000 – 27,499	2,810	27,000 – 27,499	2,150
27,500 – 27,999	4,875	13,750 – 13,999	2,430	27,500 – 27,999	2,675	27,500 – 27,999	2,125
28,000 – 28,499	4,700	14,000 – 14,249	2,342	28,000 – 28,499	2,540	28,000 – 28,499	2,100
28,500 – 28,999	4,525	14,250 – 14,499	2,254	28,500 – 28,999	2,405	28,500 – 28,999	2,075
29,000 – 29,499	4,350	14,500 – 14,749	2,166	29,000 – 29,499	2,270	29,000 – 29,499	2,050
29,500 – 29,999	4,175	14,750 – 14,999	2,078	29,500 – 29,999	2,135	29,500 – 29,999	2,025
30,000 and over	4,000	15,000 and over	2,000	30,000 and over	2,000	30,000 and over	2,000

You can write a 21-way selection to get the standard deduction from the income. However, we recommend you use **integer division** to simplify the coding. For example, for the **Single** filing status, if $20500 \leq \text{income} \leq 29999$, you can use integer division to find the bracket: `bracket=(income-20500)/500+1`, then the standard deduction will be `2500-25*bracket`.

Next the program will compute the personal exemption and the dependent exemption. The **personal exemption** is based on the filing status regardless of the income, as shown below.

Filing Status	Personal Exemption
Single	1500
Married filing separately	
Married filing jointly	3000
Head of Family	

The **dependent exemption** is based on the income regardless of filing status, as shown below. Please note the amount in the right column is for each dependent, and remember to multiply it by the number of dependents.

Adjusted Gross Income	Dependent Exemption (each dependent)
0 - 20000	1000
20001 - 100000	500
Over 100000	300

Finally, the program will compute the taxable income and the tax. The **taxable income** is obtained by subtracting the federal tax deduction, the personal exemption, the dependent exemption, and the larger of the standard deduction or itemized deduction from the income. If the taxable income is negative, reset it to 0. In actuality, if the taxable income is less than 100000, a huge tax table will be used to figure out the tax, and if the taxable is 100000 or above, a formula can be used to compute the tax. To simplify the process, the program will compute the **tax** using a formula provided in 2018 Alabama estimated tax as shown below regardless of the taxable amount. (Please see <https://revenue.alabama.gov/wp-content/uploads/2018/01/18f40esblk.pdf> if you are interested.) The formula will produce a tax in real number. Please make sure to round it to the nearest dollar. Since the maximum tax rate is 5%, the difference between the actual tax and the estimate will be no more than \$3.

Filing Status	Taxable Income	Tax
Single	First 500	2%
Married filing separately	Next 2500	4%
Head of Family	Over 3000	5%
Married filing jointly	First 1000	2%
	Next 5000	4%
	Over 6000	5%

Several sample executions of the programs are shown at the end. Although we only check the correctness of the tax, we recommend you print out the intermediate results as shown in the sample executions. You need to test your program to make sure every branch of your program works. To verify whether your program works correctly with a test case, you can post the test case and its result to Piazza and ask whether others agree with your result. **However, posting any part of C code from the project on Piazza is prohibited.**

What You Need To Do

- Create a directory named **project2** on your machine. In that directory, create a file named **tax.c**
- In **tax.c**, write the code needed to solve the problem stated above. Make sure that your program has a header block of comments that includes your name and a brief overview of the program.
- When you are ready to submit your project, compress your **project2** directory into a single (compressed) zip file, **project2.zip**. See the **Basics** document on Blackboard if you don't remember how to do it.
- Once you have a compressed zip file named **project2.zip**, submit that file to Blackboard.

Project 2 is due at 5:00pm on Friday, February 8. Late projects are not accepted.

This document including its associated files is for your own personal use only.

**You may not post this document or a portion of this document to a site
such as chegg.com without prior written authorization.**

A project shall be completed individually, with no sharing of code or solutions.

**All submissions will go through MOSS (Measure Of Software Similarity)
for similarity check.**

The University of Alabama's Code of Academic Conduct will be rigorously enforced.

Sample executions of the program

```
Enter 1-4 for filing status
1. Single
2. Married filing jointly
3. Married filing separately
4. Head of family
What is your choice? 0
Filing status must be 1-4.
```

```
Enter 1-4 for filing status
1. Single
2. Married filing jointly
3. Married filing separately
4. Head of family
What is your choice? 1
Enter number of dependents: 0
Enter adjusted gross income: 9600
Enter itemized deduction: 0
Enter federal tax deduction: 850
Standard deduction=2500
Personal exemption=1500
Dependent exemption=0
Taxable=4750
Tax is 198
```

```
Enter 1-4 for filing status
1. Single
2. Married filing jointly
3. Married filing separately
4. Head of family
What is your choice? 2
Enter number of dependents: 2
Enter adjusted gross income: 55680
Enter itemized deduction: 6780
Enter federal tax deduction: 3270
Standard deduction=4000
Personal exemption=3000
Dependent exemption=1000
Taxable=41630
Tax is 2002
```

```
Enter 1-4 for filing status
1. Single
2. Married filing jointly
3. Married filing separately
4. Head of family
What is your choice? 4
Enter number of dependents: 1
Enter adjusted gross income: 47800
Enter itemized deduction: 5870
Enter federal tax deduction: 2850
Standard deduction=2000
Personal exemption=3000
Dependent exemption=500
Taxable=35580
Tax is 1739
```