CIS611
Spring 2018
Practice Programming Assignment: PA01

Total Points: 20

Q1 (2 points): These questions are designed to ensure that you have read the syllabus (these are the give-away points)

i) It is important to attend the class (or, watch the videos, or often rewind the videos, and watch then on the same day, or within a day), so that the student does not fall behind? Choose and answer between Yes, or No.

ii) The professor will teach the concepts in the class and will show examples, which are very similar to the personal programming assignments, and the group projects. However, the assigned tasks (personal programming assignment and the group project) will have some variations, which the students are expected to solve. Choose and answer between Yes, or No.

iii) The way to succeed in this class is by writing the java code by the student. And the way to learn coding, is by attempting to write coding. On every week, code examples are provided. The student is expected to download the code example, compile and run the code examples, before attempting to attempt the weekly assignment. It is absolutely critical that the student first attempts to compile and run the code example, before trying the weekly assignment. That is a part of the weekly learning. By doing so, the learning curve and the time taken to finish the assignment will be reduced. Attempting to try the weekly assignment (without first attempting to learn from the weekly code example), will add to frustration. Choose and answer between Yes, or No.

iv) Almost on every week, there will be either a personal assignment, or a group project. Choose and answer between Yes, or No.

v) This course is all about writing code using Java programming. This course is taken by the students from different background. That is why, the professor starts teaching the course from scratch, without expecting any prior knowledge on Java coding. Each week builds on the prior week. The programming assignments aid in the group project. This course provides a foundational knowledge on Java programming, including logic and design, graphical user interface design, Object Oriented Programming (OOP), Client Server programming, database access using Java, and various Java APIs. Choose and answer between Yes, or No.

Algorithms & Flowchart and Intro To Java Programming

The purpose of Q2 and Q3 assignment is to:

- Problem solving: Algorithms and Flowcharts

Q2 (8 points)**:**
Write an algorithm (no need to write Java code for this, but write the algorithm/psreudocode) that computes the United States federal personal income tax for *N* persons. The United States federal personal income tax is calculated based on filing status and taxable income. There are four filing statuses: single filers, married filing jointly, married filing separately, and head of household. The tax rates vary every year. The table below shows the rates for 2009. If you are, say, single with a taxable income of $10,000, the first $8,350 is taxed at 10% and the other $1,650 is taxed at 15%. So, your tax is $1,082.5.

2009 U.S. Federal Personal Tax Rates Table:

Marginal Tax Rate	Single	Married Filing Jointly or Qualified Widow(er)	Married Filing Separately	Head of Household
10%	$0 – $8,350	$0 – $16,700	$0 – $8,350	$0 – $11,950
15%	$8,351– $33,950	$16,701 – $67,900	$8,351 – $33,950	$11,951 – $45,500
25%	$33,951 – $82,250	$67,901 – $137,050	$33,951 – $68,525	$45,501 – $117,450
28%	$82,251 – $171,550	$137,051 – $208,850	$68,526 – $104,425	$117,451 – $190,200
33%	$171,551 – $372,950	$208,851 – $372,950	$104,426 – $186,475	$190,201 - $372,950
35%	$372,951+	$372,951+	$186,476+	$372,951+

You are to write an algorithm to compute personal income tax. Your algorithm should prompt the user to enter the filing status and taxable income and compute the tax. Enter 0 for single filers, 1 for married filing jointly, 2 for married filing separately, and 3 for head of household. The algorithm should terminate when all *N* persons taxes are calculated.

Here are sample runs/traces of the algorithm:

Sample 1:
Enter the filing status: 0
Enter the taxable income: 100000
Tax is 21720.0

The above tax value of 21720.0 is calculated in the manner below:

T1 tax 8350 X .10 = 835.0
T2 tax 33,950-8350 = 25,599 X .15 = 3840.0
T3 tax 82250-33950 = 48300X .25 = 12075.0
T4 tax 100,000 - 82250= 17,749* .28 = 4970.0
Total is 835.0 + 3840.0 + 12075.0 + 4970.0 = 21720.0

Keep the tax value as is (the value could be decimal). However, in the example, the values are rounded up for the simplicity of the presentation.

Sample 2:
Enter the filing status: 1
Enter the taxable income: 300339
Tax is 76932.87

Sample 3:
Enter the filing status: 2
Enter the taxable income: 123500
Tax is 29665.5

Sample 4:
Enter the filing status: 3
Enter the taxable income: 4545402
Tax is 1565250.7

Q3 (5 points)**:**

Create a flowchart to the problem in question ***Q1***. Follow the flowchart general rules of representing an algorithm to solve the problem in ***Q1*** using the proper algorithm symbols and data flow paths (input, process, output, iteration).

Q4 (5 points)**:**

The purpose of Q4 is to:

- Make sure your home installation of the JDK and IDE work
- Learn how to use the basic functions of an IDE (Eclipse)
- Write a simple Java program
- Import packages
- Use some basic arithmetic expressions
- Use some basic type casting
- Use several display options (console, scanner, JOptionPane)
- Use appropriate naming conventions
- Follow programming style guidelines
- Make sure the submission process works from your environment

Write a java program that imports the *javax.swing.JOptionPane* package and uses the JOptionPane.showMessageDialog static method in order to display the following information, each on a separate message dialog box:

- Your full name as: First name, Last name
- City and Country of birth
- Your academic background
- Something about yourself, it can be informational or a fun fact, *fun facts may be shared with the class during the lecture.*

Submission:

For **Q1, Q2 and Q3**, please upload your assignment answer in a pdf document in Canvas, it should follow the submission format *FLLLLPA01.pdf* . For question **Q4**, copy the .java source files from the *src* folder in your *work space,* to another folder that should be named following

the provided naming format in this course, then zip and upload the file under this assignment answer in Canvas.

File Name: *FLLLLPA01.zip (F = first letter in your first name and LLLL = your last name)*

Grading Rubric – PA01

Student Name: _____

Question 1

Requirements	**Comments**	**Max Points Allocated**	**Points Earned**
Question i, ii, iii, iv, v		2	

Question2

Requirements	**Comments**	**Max Points Allocated**	**Points Earned**
Input: Algorithm accepts the input values of the status and the taxable income for one person.		1	
Processing: Based on the input values (status and the taxable income), the algorithm, can determine the tax rate for one person. Next, based on the tax rate, the algorithm can determine total tax for one person.		4	
Output: The algorithm shows the output of the final tax for one person.		1	
Iteration: The algorithm can iterate and can compute the tax for N number of persons.		2	
Total		**8**	

Question 3

Requirements	Comments	Max Points Allocated	Points Earned
Input: Show input symbol to accept the input value of the status and the taxable income for one person. You can draw two separate input symbols, one for the status, and another for the taxable income.		1	
Processing: Based on the input values (status and the taxable income), draw the processing symbol to determine the tax rate for one person. Next, based on the tax rate, the algorithm can determine total tax for one person. You can draw two separate processing symbols for this, or can draw it in a single processing symbol, it is your choice.		2	
Output: Draw one output symbol to show the output of the final tax for one person.		1	
Iteration: Show in the flowchart the iteration to compute the tax for N number of persons.		1	
Total		**5**	

Question 4

Requirements	**Comments**	**Max Points Allocated**	**Points Earned**
General Code Structure: Proper import of the expected Java packages (1) Proper creation of the Java file (1) The program compiles and runs successfully (2)		3	
Output: Proper display of the expected result (name, city, etc.)		2	
Total		**5**	

Total: _____/20