Assignment 1 | Control Structures

COMP 150 (ON1) : Introduction to Programming

(100 points)

Due: Feb. 19th, 2021 (23:59:00 (PDT)) [Submission via Blackboard]

Brief Description

This assignment amounts to 5% of the entire course grade. In particular, whatever your obtains as a score will be scaled to this value final grade computation. You are required to work ALONE. No late submission will be permitted (see deadline above).

The goal of this assignment is to assess your knowledge and skills on Control structures, while developing skills to map requirements to program code. You will find a grading scheme at the end of this document { to guide you on instructor's expectations while preparing your submission.

Program Requirements

Ontario's Income Tax Calculator: Employees within the province of Ontario are taxed at different levels - Federal and Provincial. Other deductions like Canadian Pension Plan (CPP), Employment Insurance, and Tax amounts are computed according to salary brackets. (click here to See Payroll Deduction for Ontario Province { Effective January 1, 2020)

> Ontario's (i.e., provincial) tax due is given as follows: 5.05%, 9.15%, 11.16%, 12.16% and 13.16% for taxable incomes in [$0 .. $44,740.01), [$44,740.01 .. $89,482.01), [$89,482.01 .. $150,000.01), [$150,000.01 .. $220,000.01) and [$220,000.01+) brackets respectively.
>
> In 2020, federal (this includes employees in Ontario) tax due is given as follows: 15.0%, 20.5%, 26.0%, 29.0% and 33.0% for taxable incomes in [$0 .. $48,535.01), [$48,535.01 .. $97,069.01), [$97,069.01 .. $150,473.01), [$150,473.01 .. $214,368.01), and [$214,368.01+) brackets respectively.
>
> Other deductions include CPP (Canada Pension Plan) and EI (Employment Insurance). While CPP is 5.25% of the gross income (but to a maximum amount of $2,898.00), EI is 1.58% of the gross income (but to a maximum amount of $856.36).
>
> Besides, the deductions above is the health premium. Ontario employees are charged health premiums using the following rules:
>
> (a) If the taxable income is less than or equal to $20,000.00, the premium is $0.00.
>
> (b) If the taxable income is greater than $20; 000:00 and less than or equal to $36; 000:00, the premium is equal to the lesser of: (i) $300:00 and (ii) 6% of (taxable income - $20,000.00);
>
> (c) If the taxable income is greater than $36; 000:00 and less than or equal to $48; 000:00, the premium is equal to the lesser of: (i) $450:00 and (ii) 300 + 6% of (taxable income - $36,000.00);
>
> (d) If the taxable income is greater than $48; 000:00 and less than or equal to $72; 000:00, the premium is equal to the lesser of: (i) $600:00 and (ii) 450 + 25% of (taxable income - $48,000.00);
>
> (e) If the taxable income is greater than $72; 000:00 and less than or equal to $200; 000:00, the premium is equal to the lesser of: (i) $750:00 and (ii) 600 + 25% of (taxable income - $72,000.00);
>
> (f) If the taxable income is greater than $200; 000:00, the premium is equal to the lesser of: (i) $900:00 and (ii) 750 + 25% of (taxable income - $200,000.00).

Write a program that:

(a) takes employee's annual taxable income from the user;

(b) writes to the screen (see figure 1):

employee's annual taxable income;

annual provincial and federal tax amounts and their respective brackets; annual CPP and EI amounts;

annual health premium; and

employee's annual net income (i.e., after deducting appropriate provincial and federal level taxes, and allowed CPP, EI and health premium).

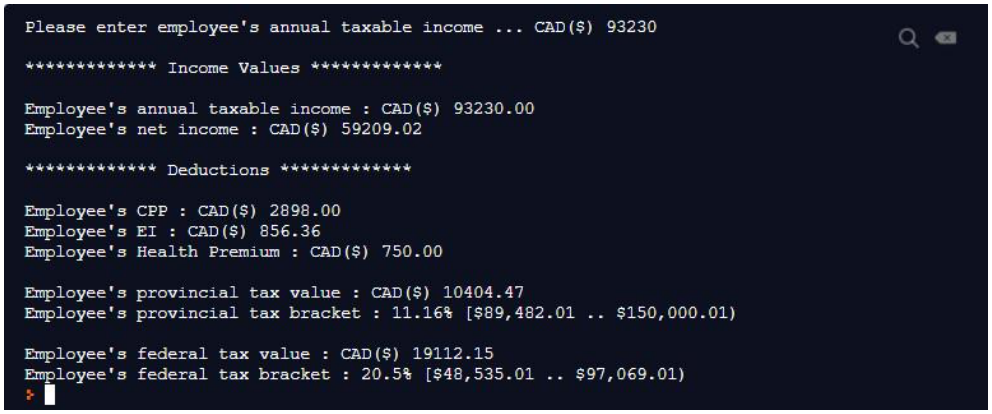

Figure 1: Expected Output - if your program works correctly.

Hint: Develop your program using Python's program mode. In particular, write a le for your program and document your program accordingly. Your program would be wrong if it allows negative salary. Notation - [x .. y) means set of values ranging between x and y, x is inclusive but y is not inclusive.

Grading Scheme

The following scheme will be used to grade your submission. Therefore, you may also use it as a guide in preparing your deliverable.

Grade Item	Weight
A syntactically and semantically correct program.	50
A program with detailed program design	15
A flowchart of your program must be included. This must represent your program. You can use pen and paper for drawings. You may also decompose the problem into separate components, draw them each and show how the components will be coupled to realize your code.	20
Program efficiency. That is, using efficient but correct control structures.	5
A program with detailed program documentation and uses sensible variable names. Your program's file name and other files should be zipped and named in the following format: [firstName_lastName_studentID]	10
Total	100