Pair Programming Assignment

In this assignment, you are required to work in a group of 2 (maximum 3) to develop a tax assessment program based on real requirements from HK Inland Revenue Department. You have to demonstrate your program to the lecturer/tutor on 9 April 2020 Thursday tutorial sessions corresponding to your group (just before Easter holiday). In your individual report, you should include the URL to the program code repositories in Github and discuss your pair programming experience. The details of individual report will be posted in due course.

1. Overview of the assignment

Please vist the HK Government web site on online tax assessment (https://www.gov.hk/en/residents/taxes/etax/services/tax_computation.htm) You are required to develop a program (in any computer language you prefer) that should exactly reflect the computed tax as calculated online (Choose the option of 'Per 2020-21 Budget Proposals – 2020-2021'). The developed system need NOT be web-based.

    a. Your program should handle:

        i. Input : husband and wife's personal income

        ii. Output : (a) calculated MPF mandatory contribution based on personal income

                (b) Salaries Tax to be paid if separate assessment assumed

                (c) Salaries Tax to be paid if joint assessment assumed

                (d) recommendation: whether joint assessment should be recommended

    c. Your program should have the flexibility of doing automated testing (that is, program can specify or accept multiple sets of input and produce multiple sets of output for testing result verification). You may use a test driver program or Junit to achieve that. Automated testing will be covered in later lectures.

    d. You should adopt the pair programming principles that one programmer reviews and tests the code made by another programmer. The role should be switched whenever appropriate. You are encouraged to use some remote access solutions that allow online sharing of code and discussion such as Teamviewer (www.teamviewer.com). You may have to discuss such collaboration tool in your individual report.

    e. In order to simply the calculation, you may assume the following items are not required to be entered (that is, set to ZERO):

    Outgoings and expenses, self education expenses, approved charitable donation, home loan interest, elderly residential care expenses, Personal disability allowance, No. of any types of dependents, No. of properties

f.   Design of cases : You may adopt approach from test-driven development as discussed in Agile development lectures – that is, you design simple and regular cases and see if your program can handle such cases correctly. If not, you go back to rework on the codes. If the results are correct, then you test your program with more complicated cases. During the process, you may have to do code refactoring on regular basis – that is, refine the code to make it more readable, simpler or more efficient in design.

2. In your calculation, please pay attention to the tax brackets (with different tax rates for different brackets of income) and the feasibility of joint tax assessment. Refer to the following URL for tax assessment guideline (for the second link, you do not have to study property tax in detail as it can be assumed that there are no property tax)

Tax bracket: https://www.gov.hk/en/residents/taxes/taxfiling/taxrates/salariesrates.htm#pr

MPF deduction: https://www.ird.gov.hk/eng/pdf/pam38e.pdf

Joint Assessment : https://www.ird.gov.hk/eng/pdf/ind_jae.pdf