Criterion A: Planning

1.0 Problem Description:
In mid-February, I was tasked with the computer science I.A. Around the same time, my parents were discussing filing taxes, and thus, I remembered when my parents had difficulty filing taxes by hand.

Since there are various tax rules depending on the source of income, filing taxes is a problem for individuals across the world. In addition, taxes can change from year to year and thus, the individuals who manually file taxes often have difficulty transitioning to new regulations.

Although currently there is tax software available, there is a lack of free options for economically disadvantaged people with open source code. Therefore, I wanted to make a tax software that could be available for everyone. Specifically, I wanted to focus on helping Canadians to calculate and file personal income taxes.

I asked an adult friend who was knowledgeable about taxes and had personal experience in the field to be my supervisor/client after I received approval from my computer science teacher for my plan. He suggested narrowing the program's capabilities to personal income. Being experienced in the field, he will be able to advise me on the disadvantages and missing details within the process of my program that will impact the consumer.

2.0 Proposed Solution:
Most electronic tax filing systems available to Canadians for personal income are proprietary.[1] As a result, they are often black-boxes to their users. The lack of transparency comes in two forms: the source code or underlying logic of the filing algorithm is unknown to the public, and the tax rules actually applied are unknown either. This may lead to some social harms, if merely due to lack of public scrutiny, not to mention the concern over corporate greed. The tax filing system just carries too much social significance to be left in the hands of private corporations.

Thus, I proposed an open-sourced electronic personal tax filing system geared to Canadians. Being aware that it takes years of effort by hundreds of programmers to develop a fully-fledged system, I would aim to develop a prototype system for this project. At the bare minimum, the prototype will receive input of both income and basic tax rules, and output the tax owed or refund to be released. However, the system should be easy to expand and customize. It should lend itself easily to incorporate new tax rules, as the tax rules change almost every year.

I decided to use Java for this task as it was the language in which I was most proficient. In addition, Java's GUI interface is very straightforward for both the user and the programmer. As to expandability, Java is excellent due to its object-orientation and the Java virtual machine.

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[1] *EFILE for electronic filers, visited 17 February 2021,* https://www.canada.ca/en/revenue-agency/services/e-services/e-services-businesses/efile-electronic-filers.html

Java is also well-connected with many open-source database systems, which I would use to store the tax rules.

3.0 Functionality:
This program will:

- calculate income taxes based on their income
- provide an interface to edit and update tax rules
- store the tax rates set by the individual
- store the income data inputted by the client
- Indicate whether the individual would receive a rebate and specify the value
- be easy to navigate for taxpayers
- display error messages for clients wherever needed

References

1. *EFILE for electronic filers, visited 17 February 2021,* https://www.canada.ca/en/revenue-agency/services/e-services/e-services-businesses/efile-electronic-filers.html

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