**Reflection**

**Overview:**

From an objective point-of-view, I believe that this Culminating was a success. I successfully managed to complete all the required tasks as well as develop a functioning program that showcases my ability to think logically and critically. Having said that, from a personal standpoint, there is a lingering discontentment of the fact that I am not handing in a piece of work that I am particularly proud of and can say that it is flawless. Nonetheless, one thing that I can say for sure is that this Culminating was filled with ups and downs and has really forced me to learn new concepts that would generally be out of my comfort zone. Whilst adjusting to the nuisances of C# is still a little troublesome, I can say that this Culminating has helped me develop a deeper understanding of the language.

**Challenges Faced:**

The first major challenge presented itself fairly early on in the project. Having only a month of experience with Windows Forms, I had a really hard time looking for a solution that would allow me to create a form with multiple pages. After some extensive research and self-teaching, the best solution, at least for Windows Forms, seemed to be to create an individual user control for each page that you would then instantiate on the parent page and dock to fill the given panel or form. This discovery was immediately followed up by the second major challenge: How would different user controls communicate information between themselves? This is when I learnt about passing arguments into the constructor method and taking advantage of class properties and access modifiers to communicate information. I would say that I still find this a little bit challenging as it can get hard to keep track of objects being passed through methods. For example, if I want to access the parent form on page five, I need to pass a reference to the parent form through pages one to four before page five can retrieve it. Even though I faced several other difficulties, I would say that the hardest challenge I faced was getting accustomed with Excel Interop. Excel Interop, as useful as it may be, was not intuitive to use at all. It required constant management of the COM objects and those would become an even bigger hassle when my program crashed. That is because if the COM objects are not released and closed programmatically, they stay open in the background and prevent you from editing the file you have opened with them. The only way to end them at that point is by using the task manager. Excel Interop also posed a lot of issues when dealing with PDF-converted-Excel files. It would often return null values or mess up column numberings due to merged columns. Even towards the end of the project, I was not any more comfortable with Excel Interop than I was at the beginning. Another minor yet arguably catastrophic challenge was commenting and elaborating on every single line that I wrote. Whilst that may not be problematic in an assignment, it quickly becomes a problem when there are files with hundreds of lines of code, all cluttered with long explanations and comments.

**Lessons and Concepts Learned:**

I learned a lot of new lessons and concepts during the Culminating. For example, Excel Interop allowed me to develop a basic understanding of what COM (Component Object Model) objects are. Windows Forms also helped me develop a better understanding of Object-Oriented Programming; a Visual representation of how objects interact with one another was helpful. Furthermore, as I mentioned earlier, I learnt about what user controls are and how I can take advantage of them. Once I got a good grasp of user controls, solving problems and developing solutions became a lot easier (in Windows Forms that is).

**Recommendations for Next Time:**

In this project, I bit off more than I could chew. As a result, the project became really tight on time towards the end, and since testing and debugging requires time, I did not get a chance to fully polish and perfect the program. Having said that, for my future projects, my goal is to allocate more time for debugging and testing. Even if that requires me to reduce the number of features, I believe that a polished simple program trumps a feature-heavy but bug-filled program. All things considered, as challenging and as demanding this Culminating may have been, I enjoyed working on it as it gave me the chance to watch my ideas be developed from the ground up to a functioning program.