Reflection Report – Q2

My experiences with implementing the Algol-60 algorithm in multiple different languages vary, as the benefits and limitations differ between C, Fortran, Ada, and Python. This includes the syntax of the languages, the length of code required to complete a task, and its overall ease of use.

My experiences with the C programming language were positive throughout this assignment, as I am very experienced and knowledgeable with C, allowing me to efficiently perform multiple functionalities. An example of this can be when opening a file for writing. This functionality is written using one line which is extremely effective resulting in organized and readable code. Furthermore, there is no additional code required to create a file, when the file specified in the *fopen* function does not exist in the current working directory. I also prefer the overall structure of C and I was able to quickly format my output to the terminal and output file with ease. Moreover, C was the first language I used to implement the Algol-60 algorithm as I found the syntax of C to be similar to that of Algol-60, allowing a smooth and easy implementation with minimal issues. Overall, I enjoy the capability and performance of the C programming language and will continue to utilize it in my future assignments.

Transitioning from C to Fortran was difficult for this assignment due to the altered program structure and syntax. Initially, I was required to commit additional research in relation to formatting as it was mandatory to have my output identical for all four programs. This was solved using the advance='no' argument in the write function. In my opinion, the syntax of Fortran is not user efficient as I continuously found myself having to retrace my code to insert the ampersand symbol (&), as my line of code would exceed the maximum character count allowed by the Fortran compiler. Another issue I encountered related to arrays in Fortran, as they begin at 1, which is uncommon in other programming languages. This resulted in multiple issues when attempting to refactor the algorithm to match the syntactical requirements of Fortran. Although I am impressed by Fortran's longevity, it was not my preferred language when writing this assignment.

My experience with ADA is similar to that of Fortran, as the code arrangement is unique to other languages. ADA uses procedures where variable declarations are in a separate dedicated section, and code modification is completed in another section, after the *begin* statement. This was an issue when referring to the algorithm in Algol-60 as it mentions the *coef* array is to be the size of *m*. Due to the fact that I could not calculate *m* before initiating the array *coef*, I initialized the size of the array to the maximum digit count possible for this assignment which is 2000. Additionally, I found the file output to be quite different and inefficient compared to a language such as C. I was required to check if the output file exists using an exception block to decipher if a new file should be created, or if a pre-existing file should be opened and overwritten.

One of the main reasons I chose to complete question 2 for this final assignment was to learn Python. From my experience, Python was the most efficient and user-friendly language due to its readability, making its syntax effortless to learn. I appreciate the shortness of a Python program, as it does not require explicit declarations of variables or force subprograms and conditionals to be enclosed in curly brackets. I was able to implement the Algol-60 algorithm with ease and reuse much of my code from C, primarily the calculations performed in the *ecalculation* subprogram.

In completing this assignment, I have concluded my primary choices for programming languages to be C and Python due to their efficiency and legible syntax. Ultimately, I am satisfied to have expanded my knowledge in multiple programming languages as I am always interested in advancing my knowledge.