

Reflection Report

The development of the 4 programs to produce the digits of Pi was one of the easier assignments. I started by transferring the pascal program to the C programming language because I am most comfortable and experienced with it. After that it was easy to transfer the code into python, ada, and fortran. There were a few setbacks though. Relearning syntax for ada and fortran was slower than I thought as well as learning some nuances of the languages such as how arrays start at 1 in fortran. Furthermore, while developing the program in python the language was simple to implement but the debugging process was difficult because I didn't understand the language that well. I had to run tests to understand how the for loops ranges were set up, if they were inclusive in the range or not. That was also an issue I had to debug after writing the program, for some reason I could not wrap my head around it. Another issue I had was that I wasn't able to understand the pascal program right away and when I tried to compile it I could not get it to work, therefore it took me awhile to figure out the nuances of the algorithm. Furthermore, fortran was causing me problems because the write to console was very odd and would always add spaces and newlines. I learned that there was a format parameter to the write function and spent a lot of time figuring out how to only get 1 character printing out.

I tested each output with the cmp function in the terminal. There was no difference in accuracy throughout the programs. If we were writing a program to accept user input for number of digits I'm sure it would be different as we would need larger than 32 bit values.

Benefits of Python

- Modern

- Popular language so many people will understand how the program is working.
- Natively supports 32 bit floats

Disadvantages

- Slower than C or lower level languages

Benefits of C

- I'm proficient with C
- Fast

Disadvantages of C

- Harder to implement algorithm
- Harder to modify algorithm for further use. Such as allowing users to input number of digits of Pi to display.

Advantages of Ada

- Reliable
- As fast as C because compilers is also based on gcc

Disadvantages

- Less widely used
- Not much real world application

Advantages of Fortran

- Used in scientific setting
- Algorithm become transferable to real life setting since using the digits of Pi may be used by some kind of researcher.
- Longevity

Disadvantages

- Not widely used so less people will understand the program easily.

