Assignment 1; Intro, C and Bash
Nathaniel Brown
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I. Purpose:

A. Develop a C program that is capable of receiving any number of CLA integers within the range of 0 - 20.
   - Must produce appropriate errors when incorrect format or invalid data is attempted to process.
   - A function will be needed for error handling and for calculating the factorials in order to drastically reduce the amount of code the C program needs.
   - First proper validation of input will be implemented, followed by an implementation of the factorial method.
   - Lastly output will be handled, in ascending order.

B. Develop a Bash script that is capable of compiling and running the C program with CLA's given to the Bash script.
   - Must produce appropriate errors when incorrect format or invalid data is attempted to process.
   - Firstly the program will handle validation and error handling.
   - Then the program will compile and run the C program.

II. Outline:

A. C Program

a. Factorial Function - Should receive a given integer and return an integer result of the factorial of that initial number. Simple reusable iterative loop.

b. Validity Function - Should receive a number or character from the CLAs. Will determine if it is within the appropriate range and return a true value.
c. Main Function - will utilize the functions described above to iterate through the arguments; first checking if each argument is a valid number. If flagged false, an appropriate error will display and the program will terminate. Provided we make it through the data validation cases We will use a bubble sort method to organize the arguments and run the factorials in ascending order, as per the extra credit rulings. Finally a simple print loop of the arguments and they're correlated factorials will occur.

B. Bash Script

a. Validity Function - This will receive a number and return a 0 or 1 depending upon whether or not the number is within the appropriate 0-20 range.
b. First the script will check if the appropriate number of CLAs are present, using a simple if/fi. If not an appropriate error will be posted.
c. Then the script will check if the filename exists. If not an appropriate error will be posted.
d. Next the program will attempt to compile the C file with the prog01 name as per instructions.
e. Then the Bash script will check if each of the arguments are valid. Similar to the C data validation above. If anything flags false, the program will echo a bash error and exit.

f. Lastly the program will execute the C program using all but the first argument (the first argument being the name of the C file itself.

III. Research:

A. C Program

a. The C program should be straightforward development of 1-2 functions and simply controlling the iteration and processing of the CLAs. Apart from simply looking into proper syntax and limitations of C (coming from only C++ background) this should be the easy part. Not much research will be needed.

B. Bash Script

a. Using background information from the Lab, compiling the script and utilizing CLAs from bash and passing them to the C file should not be an issue.
b. The main research for the bash script will be how to properly write if statements, functions, and printing errors. (As this will be my first bash script).
c. Looking further into the assignment it seems there may be an issue with the error messages effectively shifting their display message 1 to the left. This is likely due to the fact that initiating the bash script requires an additional CLA of the C files name. Research will be needed to figure out how to properly handle this.