Problem 1:

After reading two binary files, each of which contains a cubic 3D matrix, this program multiplies the matrices element-wise. It starts by opening the two files and reading the dimensions of the matrices to make sure they are the same size and don't go above 100. The memory for matrices and a result matrix is then dynamically allocated (using malloc). In order to prevent overflow, the program uses nested loops to read the matrix elements using fread, multiplies the corresponding elements (using type promotion to long long), and then writes the resultant matrix to a new binary file (result.bin) with the dimension first and all matrix elements in row-major order. The functions fopen, fread, fwrite, and malloc are important. Fopen, fread, fwrite, and malloc are important functions that I utilized within the program. A new binary file with the element-wise product of the two input matrices is the end result.

Problem 2:

This program counts the number of lines in files that end in ".txt" by recursively going through a given directory and all of its subdirectories. It iterates through directory entries using <dirent.h> functions (such as opendir and readdir) and uses <sys/stat.h> with stat to identify if an entry is a file or a directory. The application uses strrchr and strcmp to determine whether the file name ends in ".txt" before opening the file to count newline characters using fgetc if an entry is not a directory or if opening as a directory fails. Recursively, the counts from distinct files and subdirectories are added up. Opendir, readdir, snprintf, and fgetc are important functions. The total number of lines from all ".txt" files in the specified directory is shown in the final output.