

# URI CSC 412 Prog03 Report

## Algorithms of your exploration of the directory hierarchy:

The script first checks if the output directory specified in the third argument exists. If it does, it removes all files inside it. If it doesn't exist, it creates it.

Then, it uses the find command to explore the directory hierarchy specified in the first argument, looking for files with a ".tga" extension. For each file found, it executes the matchSearch program passing the file path as the first argument, the search image path as the second argument, and the output directory as the third argument.

## Algorithm match search (C program):

The matchSearch is searching for images with the .tga extension in a directory, comparing them to another image provided as an argument, and writing the names of matching images to a text file.

The matchSearch function takes three arguments: dirPath is the path of the directory to search, imgPath1 is the path of the image to compare to, and str is a string to store the result of the search. It opens the directory using opendir, reads each entry in the directory using readdir, and forks a new process to run the compare executable on each .tga image found. The compare executable is executed using the execl function with the imgPath1 and imgPath arguments. The child process waits for the compare process to exit using waitpid, and if the exit status indicates a match, it increments a counter and appends the name of the matching image to a string.

The writeToDir function takes two arguments: path is the path of the file to write, and lines is the string to write to the file. It opens the file using fopen, writes the string to the file using fputs, and closes the file using fclose.

The main function checks that the program has been called with the correct number of arguments, sets up the arguments and result string, calls matchSearch to search for matching images, and writes the result to a file using writeToDir.

## Special data type or data structure that you needed to create for the project:

In terms of data types and structures, the program uses standard C types such as char\*, int, and pid\_t. It also uses the DIR and struct dirent types from the dirent.h header to read the directory entries, and the waitpid function to wait for child processes to exit.

## Current limitation of your code

One potential limitation of the program is that it assumes that the compare executable is present in the same directory as the program itself. If the compare executable is not present, the program will crash with an error. Another limitation is that the program does not check if the output directory exists before writing to it, which could also result in a crash. Additionally, the program assumes that all .tga files in the directory are valid images that can be compared, but this may not always be the case.