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HW4 Report

For this assignment I decided to implement a function that does both the usage and finds the largest files at the same time. In order to do this, the function needed to return all the necessary values meaning it would need to return multiple strings and integers. Therefore, I decided to implement a struct that stores all the necessary values and have the function return that struct. The struct stored the names of the biggest writeable and non-writeable files, as well as their sizes, and it stored the total disk usage. The function has many local variables that store the current max sizes as well as the names and the current total disk usage. Each recursive call would have its own set of local variables. The function uses readdir to iterate through the directory. It then checks if the current file/directory is a directory. If it is a directory, the function recursively calls itself on the directory. The function then compares the returned values from this recursive call to the current local variables. If either of the size values from the recursive call are larger than the current local variables, all values are updated appropriately. The usage from the recursive call is also added to the current usage. If the file is not a directory, it is checked if the file is a regular file. If it is the function adds the disk usage to the current usage and the permissions of the file are checked. If the file is writeable, it compares its size to the current writeable size, it does the same for non-writeable if the file does not have the write permission. If the size is greater the local variables for size and name get updated appropriately. After the loop is done and every item was iterated through, the local variables get stored in the struct to be returned. The main function then uses the returned struct to print all the required values.