OS ASSINGMENT SID 2119372

The following bash code was test on Mac OS X Ventura 13.2, Asahi Arch Linux and openSUSE Tumbleweed.

#!/bin/bash

# Check if a filename was provided as command-line argument

if [ $# -eq 1 ]; then

# Read in the source and destination folders from the text file

while read -r source destination; do

# Check if the source folder exists

if [ -d "$source" ]; then

# Prompt the user to confirm overwrite if the destination folder already exists

if [ -d "$destination" ]; then

read -p "The destination folder already exists. Overwrite? (y/n) " confirm

if [ "$confirm" != "y" ]; then

echo "Copy task aborted by user."

exit 1

fi

fi

# Copy the source folder and its contents to the destination folder

cp -r "$source" "$destination"

echo "Successfully copied $source to $destination."

else

echo "Error: $source does not exist."

fi

done < "$1"

else

# Prompt the user to enter the source and destination folders

read -p "Enter the source folder: " source

read -p "Enter the destination folder: " destination

# Check if the source folder exists

if [ -d "$source" ]; then

# Prompt the user to confirm overwrite if the destination folder already exists

if [ -d "$destination" ]; then

read -p "The destination folder already exists. Overwrite? (y/n) " confirm

if [ "$confirm" != "y" ]; then

echo "Copy task aborted by user."

exit 1

fi

fi

# Copy the source folder and its contents to the destination folder

cp -r "$source" "$destination"

echo "Successfully copied $source to $destination."

else

echo "Error: $source does not exist."

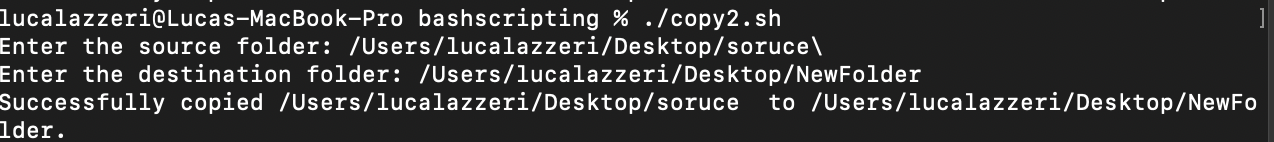
Fi

Fi #"copy2.sh" 45L, 1605B

Text

Description automatically generated

When the code is running the user is prompted for a source and destination location on your computer, if the folder already exists it prompts the user. If they decided to not overwrite the file, it tells them the task was aborted.



If the user has decided to create a new directory it when typing in the location of the destination it creates the folder and moves the source into the new destination and then prompts the user with the new location of the files.

Text

Description automatically generated

If the users decide to overwrite the existing destination folder already exists, it prompts the user. In this case the user chose to overwrite the existing file and the program has overwritten the file and pasted the folder and its contents to its new directory

Questions

1. What is meant by starvation in process management? What will be the consequence of starvation? How can starvation be avoided?

Starvation in an operating system is a problem with the resource management where the OS does not have access to resources because they are currently being used up by other processes. Starvation in an OS is caused by high priority requests being processed first and the least priority taking time to process. Starvation occurs when a process requires resources to be executed but is not allowed by the system.

Due to the adverse effects created by starvation, the systems performance will be being to degrade as process cannot be executed; a deadlock can occur, this is when multiple processes are starved for resources and because of the reduced performance it causes for a slow don in throughput and so the execution of tasks takes longer.

These issues can be avoided through the use of fair system resource allocation through implementing a new scheduling algorithm that gives equal access to processes. Also, time-based scheduling can be implemented to give each process a time slot so it cannot hold up resources for longer than necessary keeping other system working.

1. In the context of memory management, what is a page fault? Describe the actions that follow after a page fault occurs.

A page fault occurs when a process attempts to access a page of memory that has not been physically mapped or it can be that it is mapped to a page that is not present in physical memory. When a page fault occurs, first a page fault exception is generated and suspends the execution of the process, then the OS determines the cause of the fault through examination of the memory addresses that where present in the fault. If the fault was caused by a page that isn’t in physical memory this OS loads it into physical storage through a process called swap-in. if there is not enough physical memory to hold the missing page, the operating system may store one or more pages on a secondary storage device like an SSD. Once the missing page is loaded into memory the OS can update the page tables and resumes the execution of processes at the instruction.

1. My email system gives me a choice of POP3 or IMAP. I am currently using POP3. Why might I want to switch to IMAP? Explain. Both POP3 and IMAP and give justifications whether I should switch to IMAP

POP 3, Post Office Protocol version 3, is a protocol that downloads email messages to your device locally and deletes them from the server when stored elsewhere.

IMAP, Internet Messaging Protocol, allows you to view and manage your email directly on a server. This means that your email is synchronized across all your devices and can be assessed from anywhere, given there is an internet connection.

IMAP would be better suited for people who are on the go and switch between multiple devices and do not mind there information not being stored locally. However, if you would like all of your emails held privately and restrict access from a third party to view the content of your emails, POP3 would be the better solution for you. Also, POP 3 provides the benefit of viewing from an offline device.

1. In an operating system what does it mean when a computer is said to be “thrashing”? How can it be prevented?

When a computer is “thrashing”, it means that there is a high degree of paging and or swapping. This is the process of moving data from RAM into virtual memory, virtual memory being a slice of the secondary storage being used to hold information where there is not enough room in physical memory. Due to this constant movement of data from high-speed physical memory to slower secondary memory the computers performance takes a hit as the a SSD cannot move data as fast as the on board RAM in a computer. This can be prevented by either upgrading to higher RAM capacities or to upgrade to an NVM E M.2 drive. Or if that is not possible, keeping unnecessary programs closed when not in use. Adjusting file sizes too get smaller paging files (not user controllable).

1. In the bash shell what does the ampersand (“&”) symbol mean when used in a command? If I used an & in a command why might I need to use the command “ps”?

Within a bash shell program, the ampersand symbol is used to place a command in the background allowing the user to still use that instance of the CLI (Command Line Interface), without interrupting the user. For the user to check the status of the job, the ‘fg’ command can be used followed by its job ID which will be a percentage sign “%” followed by a number.

The ‘ps’ command would be used to display information about the current running processes in the background. The list of information shows the process ID alongside a few other pieces of information.