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Panel C, CI Batch

MAIoT Lab Assignment 10

Problem Statement:

Write a study report to simulate 'cp' command in Linux Environment.

Objective:

1. Understand the file handling in Assembly language.
2. Understand the command line arguments.

Theory:

Explain all functions used in file operation:

- File open: This function is used to open a file in the OS for reading, writing or both. The system call used to open a file usually takes a file name and a set of flags that specify the intended mode of access such as read-only, write-only or read-write.
- File read: This function is used to read data from an open file into a buffer in memory. The system call is used to read data from a file usually takes a file descriptor, a pointer to a buffer in memory, and the number of bytes to read.
- File write: used to write data from a buffer in memory to an open file. System call used to write data to a file usually takes a file descriptor, a pointer to a buffer in memory and the number of bytes to write.

- File create: used to create a new file in the OS. system call used to create a file usually takes a file name and a set of flags that specify the intended mode of access and the permissions for the file.
- File close: Used to close an open file and release the associated system resources. When a file is opened the OS assigns a file description to represent the open file memory.

Algorithm.

- Open the source file in read mode.
This operation loads the file from secondary storage using given filename to memory.
- Read the source file content and store into buffer.
To read records from the file we need to define a temporary buffer in memory where data read from the file would be written.
- Create a destination file in read and write mode.

Environment:

OS - 64 bit Ubuntu 18.04

CPU - 64 bit core 2 duo

Conclusion:

Thus, the study has done to simulate 'cp' command in Linux by taking flip classroom activity.

FAQ's

1. What is file descriptor?
→ A file descriptor is a 16-bit integer assigned to a file as a file id. When a new file is created or an existing file is opened, the file descriptor is used for accessing the

File. File descriptor of the standard file streams - stdin, stdout and stderr are 0, 1, and 2 resp.

2. What is the copy command in Linux?

→ cp is the command in Unix and Linux to copy your files or directories. [file/directory-sources] specifies the sources of the files or directories you want to copy. And [destination] arguments specifies the location you want to copy the file to.

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CODE:

```
section .data
msg1 db "Error",10
msg11 equ $-msg1
msg2 db "File copy successfully",10 msg12 equ $-msg2

%macro operate 4 mov rax,%1
mov rdi,%2
mov rsi,%3

mov rdx,%4 syscall %endmacro

section .bss fname1 resb 15 fd1 resq 1 fname2 resb 15 fd2 resq 1

buff resb 512 buflen resq 1

section .txt global _start _start:

pop r8 cmp r8,3

jne err pop r8 pop r8

mov rsi,fname1

above:
mov al,[r8] cmp al,00

je next mov [rsi],al inc r8
inc rsi
jmp above

next:

pop r8
mov rsi,fname2
```


above2: mov al,[r8] cmp al,00

je next2 mov [rsi],al inc r8
inc rsi
jmp above2

next2:

operate 2,fname1,000000q,0777q mov [fd1],rax

operate 0, [fd1], buff, 512 mov [bufflen],rax

operate 85,fname2,0777q,0 operate 2,fname2,2,0777q mov [fd2],rax

operate 1,[fd2],buff,[bufflen]

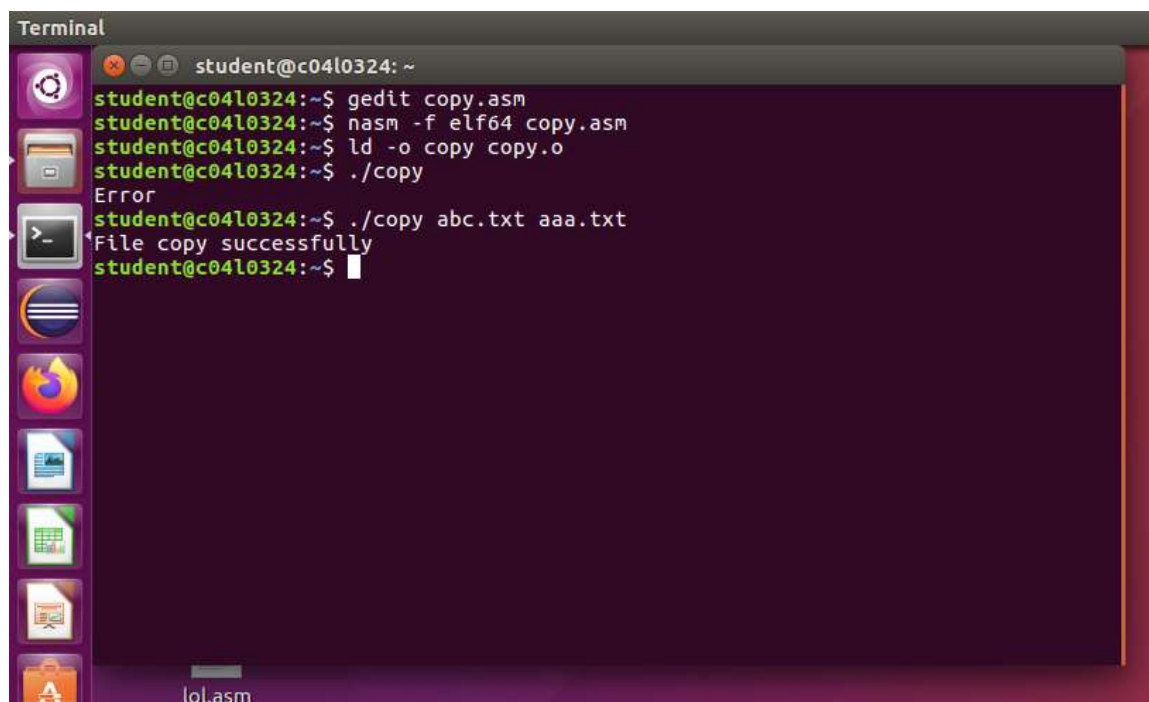
operate 3,[fd2],0,0 operate 3,[fd1],0,0

operate 1,1,msg2,msgl2

jmp end err:

operate 1,1,msg1,msgl1 end:operate 60,0,0,0

OUTPUT:



The image shows a terminal window titled "Terminal" with a dark background. The prompt is "student@c04l0324: ~". The user enters several commands: "gedit copy.asm", "nasm -f elf64 copy.asm", "ld -o copy copy.o", and "./copy". After the last command, an "Error" message appears. The user then enters "./copy abc.txt aaa.txt", and the output "File copy successfully" is displayed. The terminal window has a sidebar on the left with various application icons. At the bottom of the terminal, the text "lol.asm" is visible.

```
student@c04l0324: ~
student@c04l0324:~$ gedit copy.asm
student@c04l0324:~$ nasm -f elf64 copy.asm
student@c04l0324:~$ ld -o copy copy.o
student@c04l0324:~$ ./copy
Error
student@c04l0324:~$ ./copy abc.txt aaa.txt
File copy successfully
student@c04l0324:~$
```