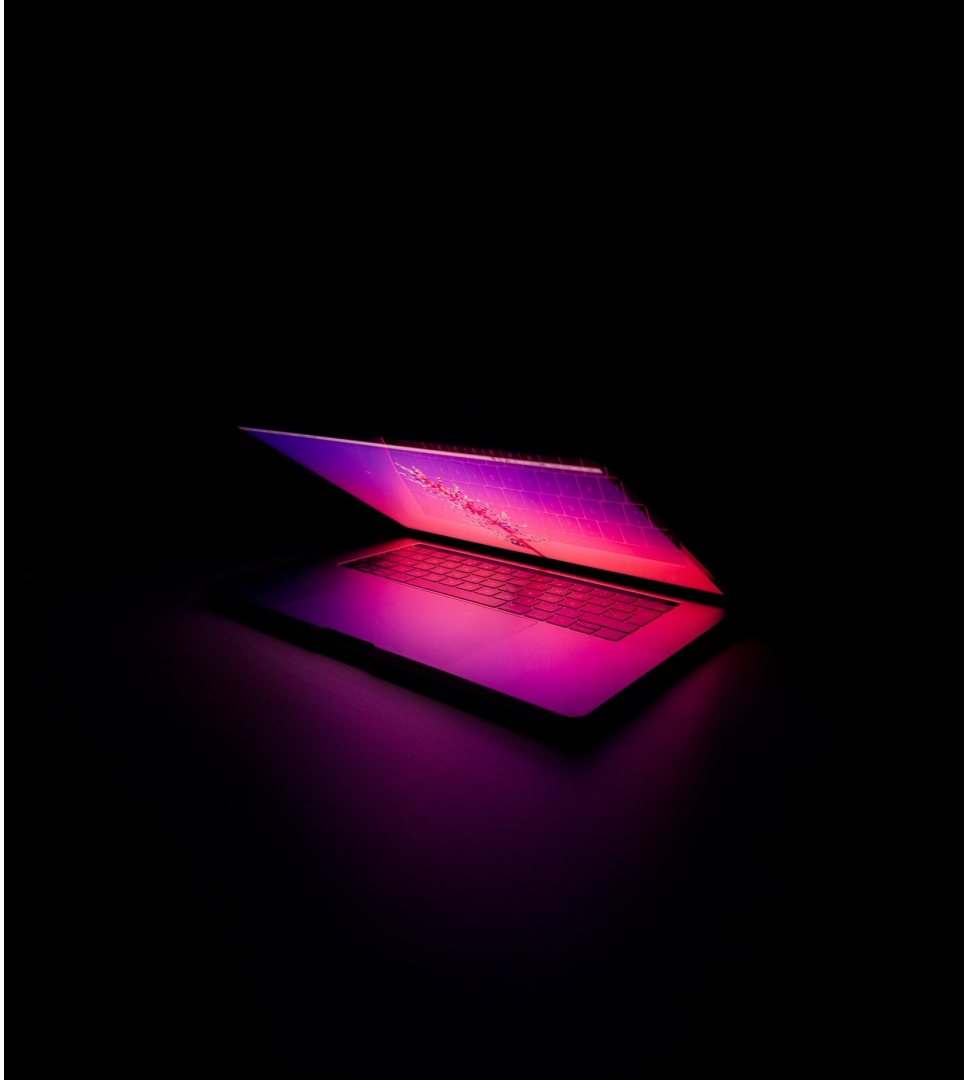
Universidade Federal do Piauí

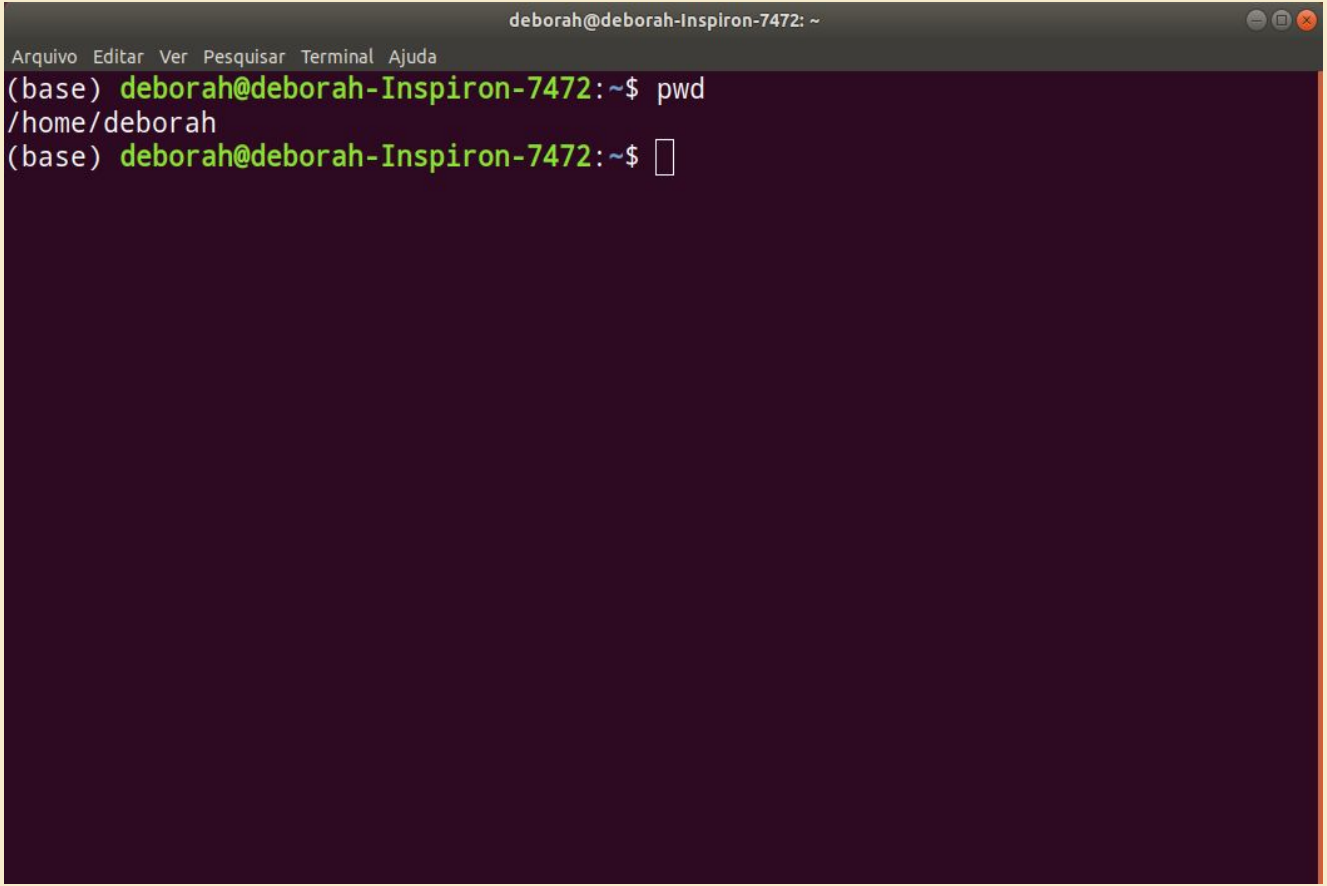
Sistemas Operacionais

Conceitos básicos: Chamadas de Sistema

Profa: Deborah Magalhães



O terminal faz parte do SO?



Hierarquia de Processos

Processo Pai

1

```
(base) deborah@deborah-Inspiron-7472:~$ top | grep shell
 1505 deborah   20   0 4518884 650668 124948 S   0,3  4,0 354:39.39 gnome-shell
 1505 deborah   20   0 4518884 650668 124948 S   0,3  4,0 354:39.40 gnome-shell
 1505 deborah   20   0 4518884 650668 124948 S   0,7  4,0 354:39.42 gnome-shell
 1505 deborah   20   0 4518884 650668 124948 S   0,7  4,0 354:39.44 gnome-shell
```

2

```
PING www.google.com (172.217.29.4) 56(84) bytes of data.
64 bytes from eze03s06-in-f4.1e100.net (172.217.29.4): icmp_seq=1 ttl=117 time=4
9.6 ms
64 bytes from eze03s06-in-f4.1e100.net (172.217.29.4): icmp_seq=2 ttl=117 time=4
8.6 ms
64 bytes from eze03s06-in-f4.1e100.net (172.217.29.4): icmp_seq=3 ttl=117 time=4
```

3

Processo Filho

```
(base) deborah@deborah-Inspiron-7472:~$ top | grep ping
  768 deborah   20   0   22656   2560   2384 S   0,3  0,0   0:00.02 ping
  768 deborah   20   0   22656   2560   2384 S   0,3  0,0   0:00.03 ping
```

Definindo saída

Saída Terminal

```
(base) deborah@deborah-Inspiron-7472:~$ cat README.md
# SONYC Urban Sound Tagging (SONYC-UST): a multilabel dataset from an urban acou
stic sensor network
Version 2.1, March 2020

## Created by
Mark Cartwright (1,2,3), Jason Cramer (1), Ana Elisa Mendez Mendez (1), Yu Wang
(1), Ho-Hsiang Wu (1), Vincent Lostanlen (1,2,4), Magdalena Fuentes (1), Graham
Dove (2), Justin Salamon (1,5), Oded Nov (6), Juan Pablo Bello (1,2,3)

1. Music and Audio Research Lab, New York University
2. Center for Urban Science and Progress, New York University
3. Department of Computer Science and Engineering, New York University
4. Cornell Lab of Ornithology
5. Adobe Research
6. Department of Technology Management and Innovation, New York University

## Publication
If using this data in an academic work, please reference the DOI and version, as
 well as cite the following paper, which presented the data collection procedure
 and the first version of the dataset:
```

Saída Arquivo

```
(base) deborah@deborah-Inspiron-7472:~$ cat README.md > output_cat.txt
(base) deborah@deborah-Inspiron-7472:~$ cat output_cat.txt
# SONYC Urban Sound Tagging (SONYC-UST): a multilabel dataset from an urban acou
stic sensor network
Version 2.1, March 2020

## Created by
Mark Cartwright (1,2,3), Jason Cramer (1), Ana Elisa Mendez Mendez (1), Yu Wang
(1), Ho-Hsiang Wu (1), Vincent Lostanlen (1,2,4), Magdalena Fuentes (1), Graham
Dove (2), Justin Salamon (1,5), Oded Nov (6), Juan Pablo Bello (1,2,3)

1. Music and Audio Research Lab, New York University
2. Center for Urban Science and Progress, New York University
3. Department of Computer Science and Engineering, New York University
4. Cornell Lab of Ornithology
5. Adobe Research
6. Department of Technology Management and Innovation, New York University

## Publication
If using this data in an academic work, please reference the DOI and version, as
 well as cite the following paper, which presented the data collection procedure
 and the first version of the dataset:
```

Definindo entrada

Entrada Arquivo

```
(base) deborah@deborah-Inspiron-7472:~$ sort output_cat.txt > output_cat_sorted.
txt
(base) deborah@deborah-Inspiron-7472:~$
```

Saída Arquivo

```
8. dog
## Acknowledgments
## Annotation data
*annotator\_id*
## Audio data
*audio\_filename*
*block*
*borough*
Cartwright, M., Mendez, A.E.M., Cramer, J., Lostanlen, V., Dove, G., Wu, H., Sal
amon, J., Nov, O., Bello, J.P. SONYC Urban Sound Tagging (SONYC-UST): A Multilab
el Dataset from an Urban Acoustic Sensor Network. In *Proceedings of the Worksho
p on Detection and Classification of Acoustic Scenes and Events (DCASE)*, 2019.
## Change log
*<coarse\_id\>\_<coarse\_name\>\_presence*
*<coarse\_id\>-<fine_id\>\_<fine_name\>_presence*
*<coarse\_id\>-<fine_id\>\_<fine_name\>\_proximity*
### Columns
: Columns of this form indicate the presence of a coarse-level class. `1` if pre
sent, `0` if not present. If `-1`, then the class was not labeled in this annota
tion because the annotation was performed by a SONYC team member who only annota
ted one coarse group of classes at a time when annotating the verified subset. T
hese columns are computed from the fine-level class presence columns and are pre
```

Executando processo em background

Ping em background

```
(base) deborah@deborah-Inspiron-7472:~$ ping www.google.com &
[1] 7791
(base) deborah@deborah-Inspiron-7472:~$ PING www.google.com (172.217.172.132) 56
(84) bytes of data.
64 bytes from gru14s13-in-f4.1e100.net (172.217.172.132): icmp_seq=1 ttl=117 tim
e=47.9 ms
64 bytes from gru14s13-in-f4.1e100.net (172.217.172.132): icmp_seq=2 ttl=117 tim
e=52.1 ms
64 bytes from gru14s13-in-f4.1e100.net (172.217.172.132): icmp_seq=3 ttl=117 tim
e=51.8 ms
```

Finalizando o processo

```
(base) deborah@deborah-Inspiron-7472:~$ kill 7791
(base) deborah@deborah-Inspiron-7472:~$
```

Chamadas de Sistema

```
user@user-ThinkPad-T470:~/WIP/STAT_SYSTEM_CALL$ ls -lart | grep test.c
-rw-r--r-- 1 user user   1598 Jan  3 07:20 test.c
user@user-ThinkPad-T470:~/WIP/STAT_SYSTEM_CALL$ ./hello
Enter the name of a file to check:
test.c

File st_uid 1000

File st_blksize 4096

File st_gid 1000

File st_blocks 8

File st_size 1598

File st_nlink 1

File Permissions User
rw-

File Permissions Group
r--

File Permissions Other
r--
user@user-ThinkPad-T470:~/WIP/STAT_SYSTEM_CALL$
```

“

Chamadas de sistema são funções (interfaces) **usadas** pelos aplicativos do USUÁRIO para solicitar a EXECUÇÃO de algum **SERVIÇO** do sistema operacional

Quais serviços?

- Processos
- Diretórios
- Arquivos
- Diversas

Processos

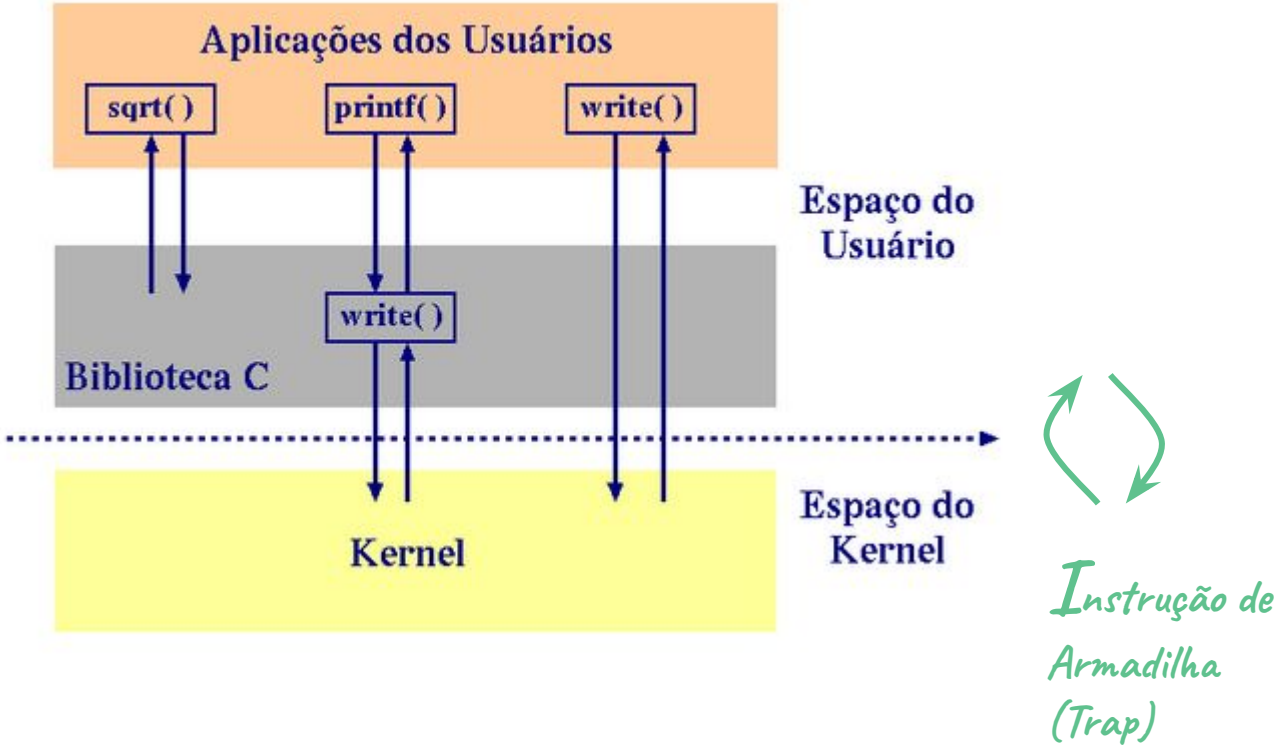
Arquivos

Diretório

Diversos

UNIX	Win32	Descrição
fork	CreateProcess	Cria um novo processo
waitpid	WaitForSingleObject	Pode esperar que um processo termine
execve	(nenhuma)	CreateProcess = fork + execve
exit	ExitProcess	Conclui a execução
open	CreateFile	Cria um arquivo ou abre um arquivo existente
close	CloseHandle	Fecha um arquivo
read	ReadFile	Lê dados a partir de um arquivo
write	WriteFile	Escreve dados em um arquivo
lseek	SetFilePointer	Move o ponteiro do arquivo
stat	GetFileAttributesEx	Obtém vários atributos do arquivo
mkdir	CreateDirectory	Cria um novo diretório
rmdir	RemoveDirectory	Remove um diretório vazio
link	(nenhuma)	Win32 não dá suporte a ligações
unlink	DeleteFile	Destrói um arquivo existente
mount	(nenhuma)	Win32 não dá suporte a mount
umount	(nenhuma)	Win32 não dá suporte a mount
chdir	SetCurrentDirectory	Altera o diretório de trabalho atual
chmod	(nenhuma)	Win32 não dá suporte a segurança (embora o NT suporte)
kill	(nenhuma)	Win32 não dá suporte a sinais
time	GetLocalTime	Obtém o tempo atual

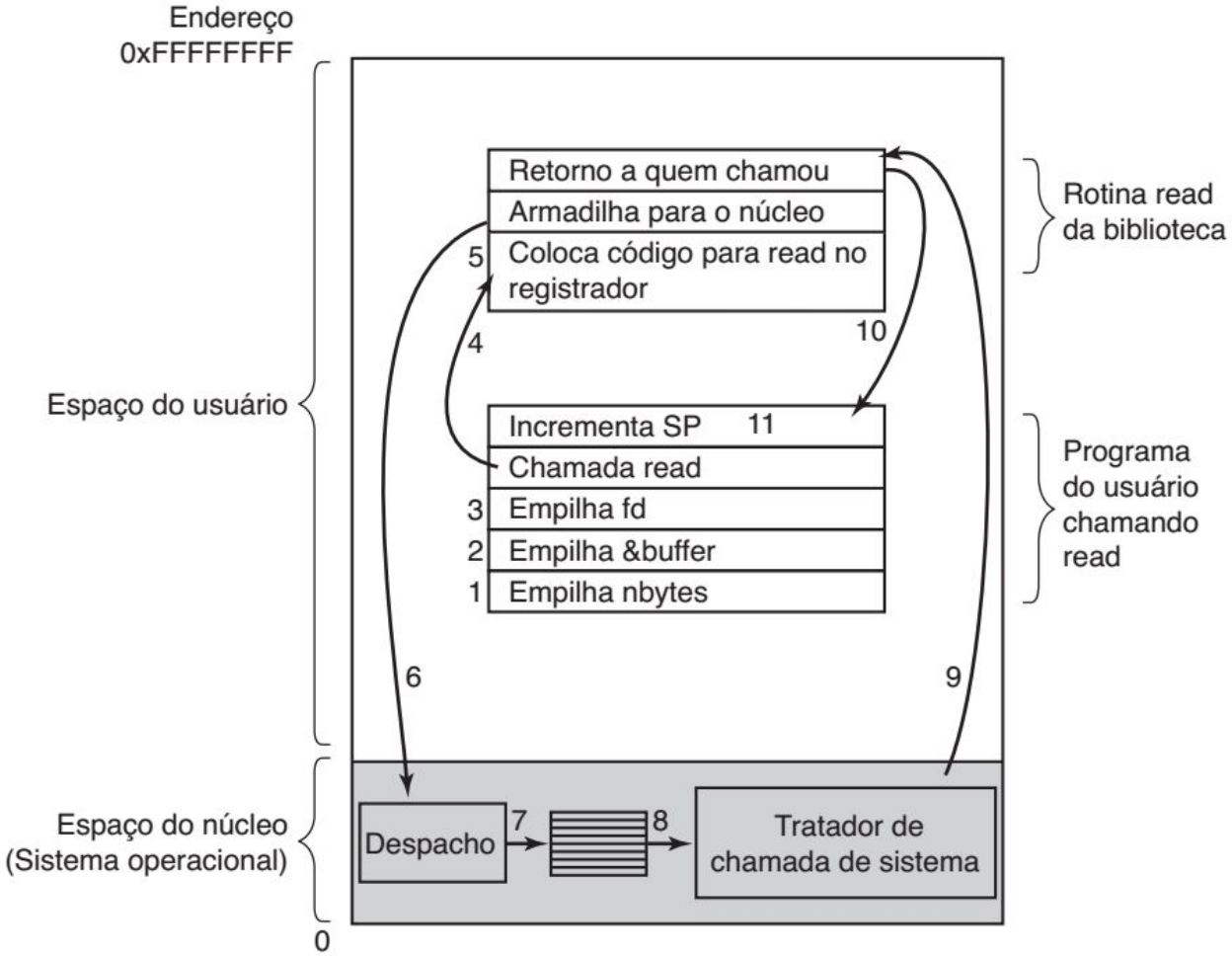
POSIX (International Standard 9945-1)



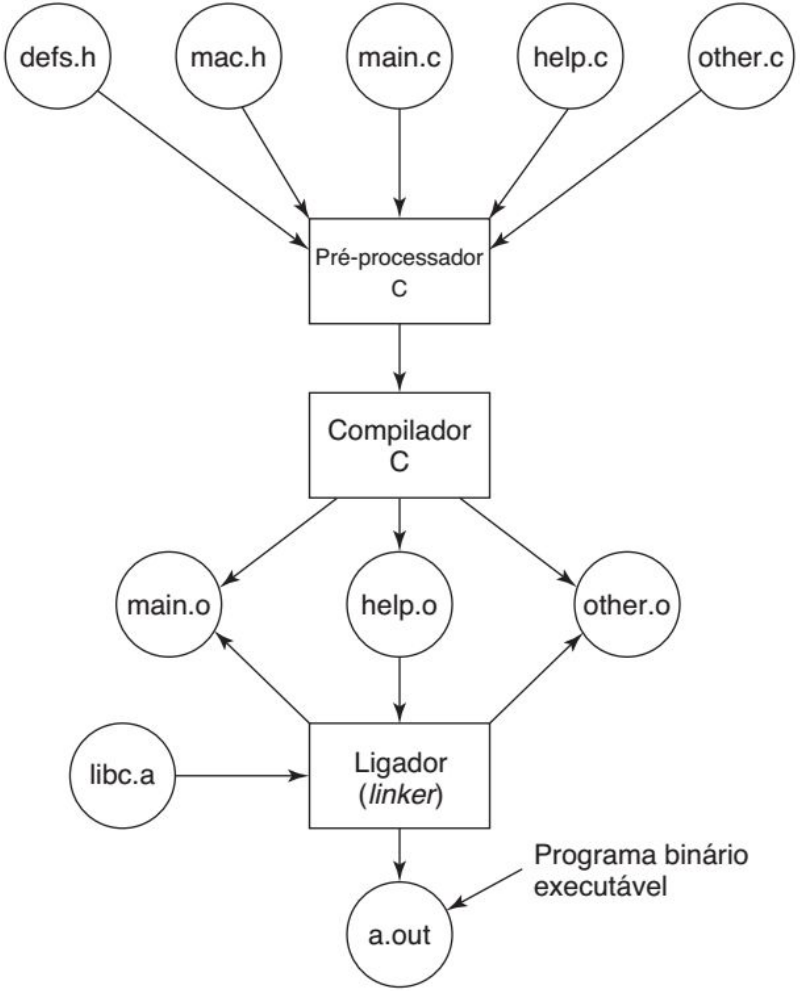
Como ocorre uma chamada de sistema

Exemplo read

```
contador = read(fd, buffer, nbytes)
```



Compilação em C



Chamada p/ gerenciamento de arquivo

- Compilar:

  `$ gcc -o read read.c`

- Executar:

  `$ ./read`

Output

```
deborah@deborah-Lenovo-ideapad-300S-14ISK:~$ ./read
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
```

Atividade **individual** ou em **dupla (1.0 pt)**: enviar no sigaa o link de um VÍDEO curto **(5-8 min)** executando até **3** comandos que utilize os operadores `|`, `>` e `&` e mostrando a execução de um código em **.c** que realize uma chamada de sistema

Muito Obrigada!

Se você tiver qualquer dúvida ou sugestão:

- deborah.vm@ufpi.edu.br

UNIVERSIDADE FEDERAL DO PIAUÍ