

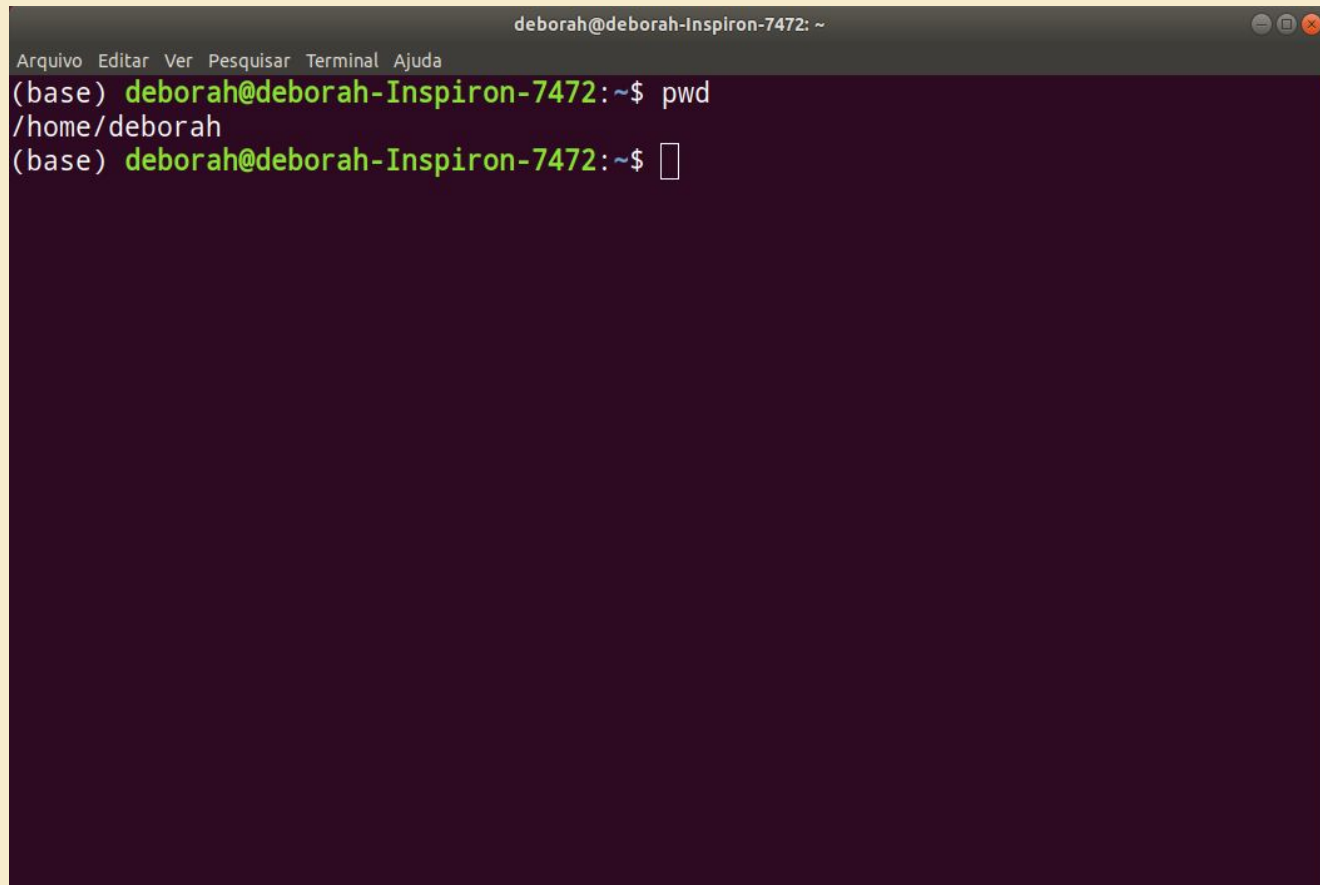
Sistemas Operacionais

Chamadas de sistema

Profa: Deborah Magalhães



**O terminal
faz parte do
SO?**

A screenshot of a terminal window with a dark purple background. The window title is 'deborah@deborah-Inspiron-7472: ~'. The menu bar at the top includes 'Arquivo', 'Editar', 'Ver', 'Pesquisar', 'Terminal', and 'Ajuda'. The terminal shows a prompt '(base) deborah@deborah-Inspiron-7472:~\$' followed by the command 'pwd'. The output is '/home/deborah'. A second prompt '(base) deborah@deborah-Inspiron-7472:~\$' is shown with a cursor, indicating the command has been executed successfully.

```
deborah@deborah-Inspiron-7472: ~
Arquivo Editar Ver Pesquisar Terminal Ajuda
(base) deborah@deborah-Inspiron-7472:~$ pwd
/home/deborah
(base) deborah@deborah-Inspiron-7472:~$
```

Hierarquia de Processos

1

Processo
Pai

```
(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 acoustic 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 acoustic 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)

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```

Definindo entrada

Entrada Arquivo

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

Saida 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., Salamon, J., Nov, O., Bello, J.P. SONYC Urban Sound Tagging (SONYC-UST): A Multilabel Dataset from an Urban Acoustic Sensor Network. In *Proceedings of the Workshop 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 present, `0` if not present. If `-1`, then the class was not labeled in this annotation because the annotation was performed by a SONYC team member who only annotated one coarse group of classes at a time when annotating the verified subset. These 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

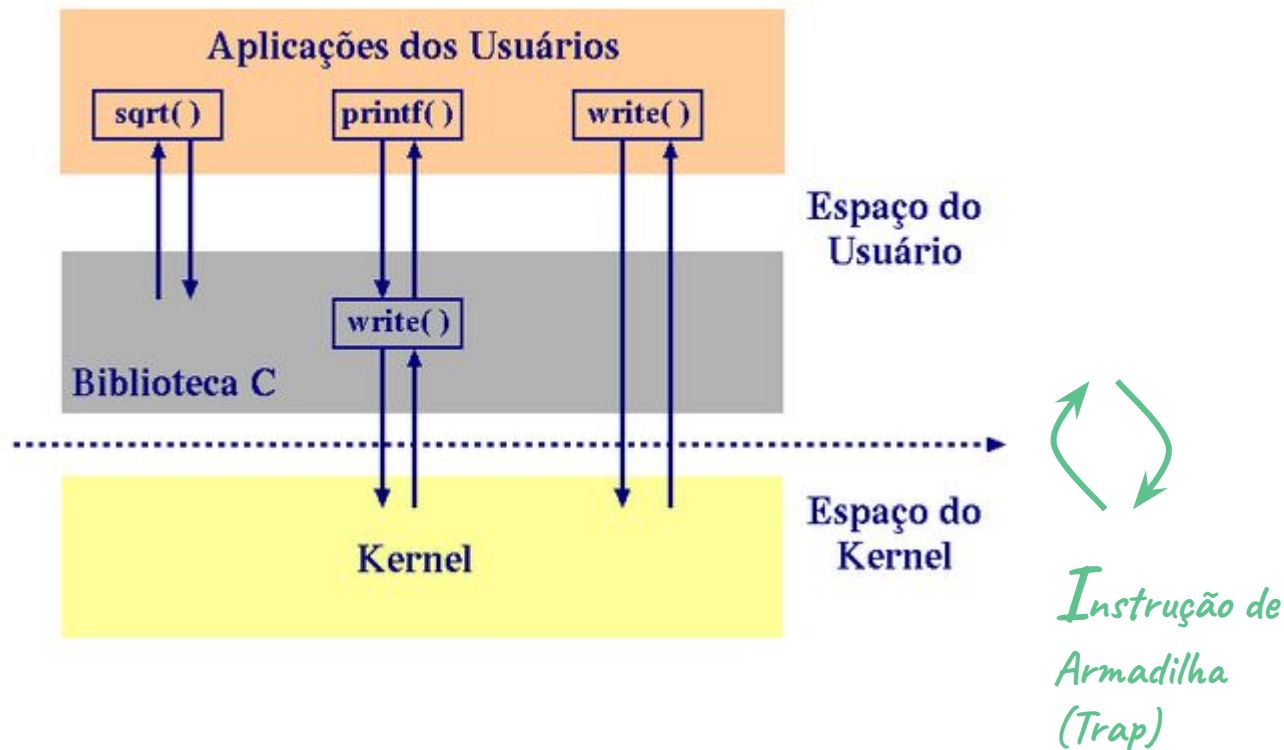


Diversos



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

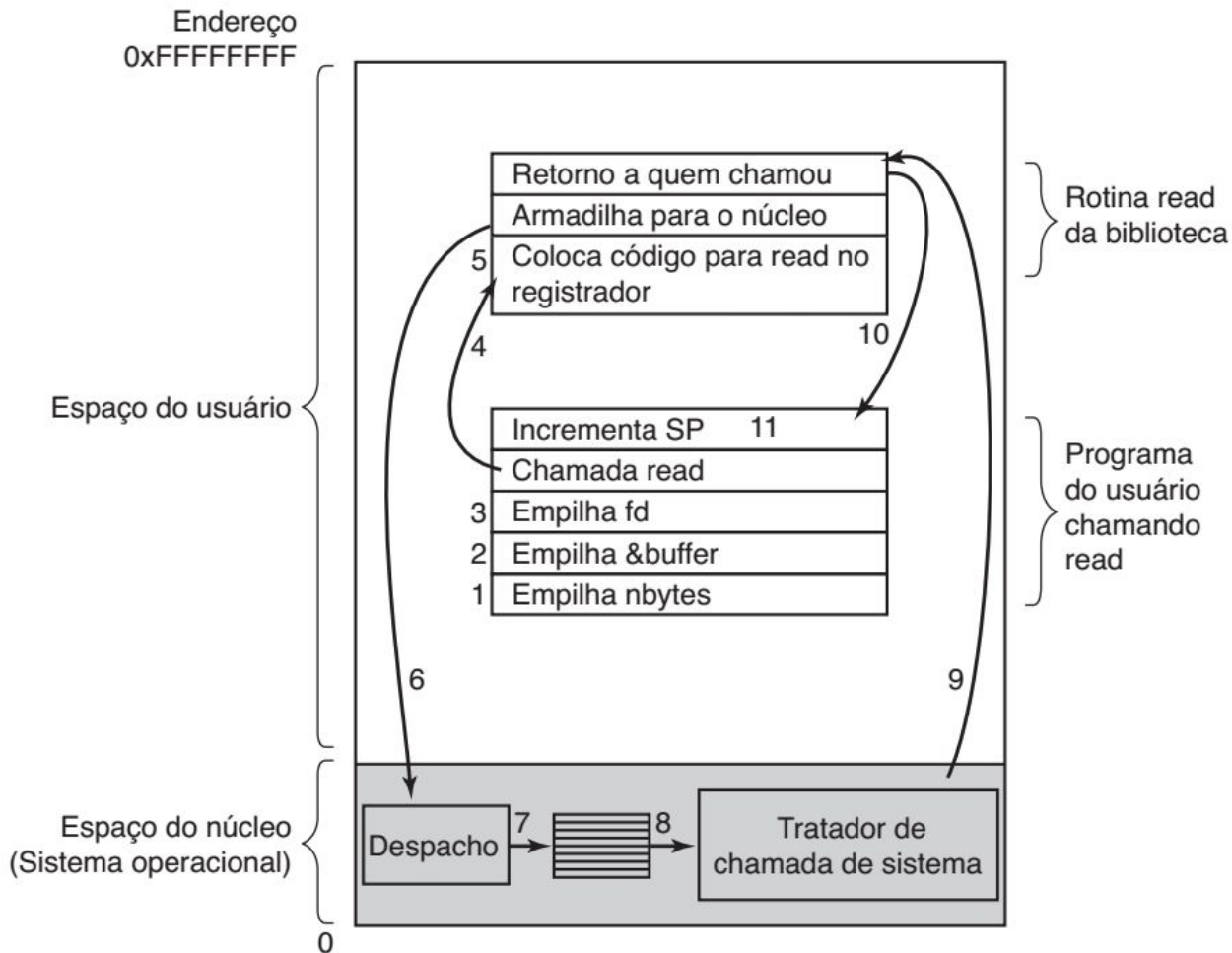
POSIX (International Standard 9945-1)



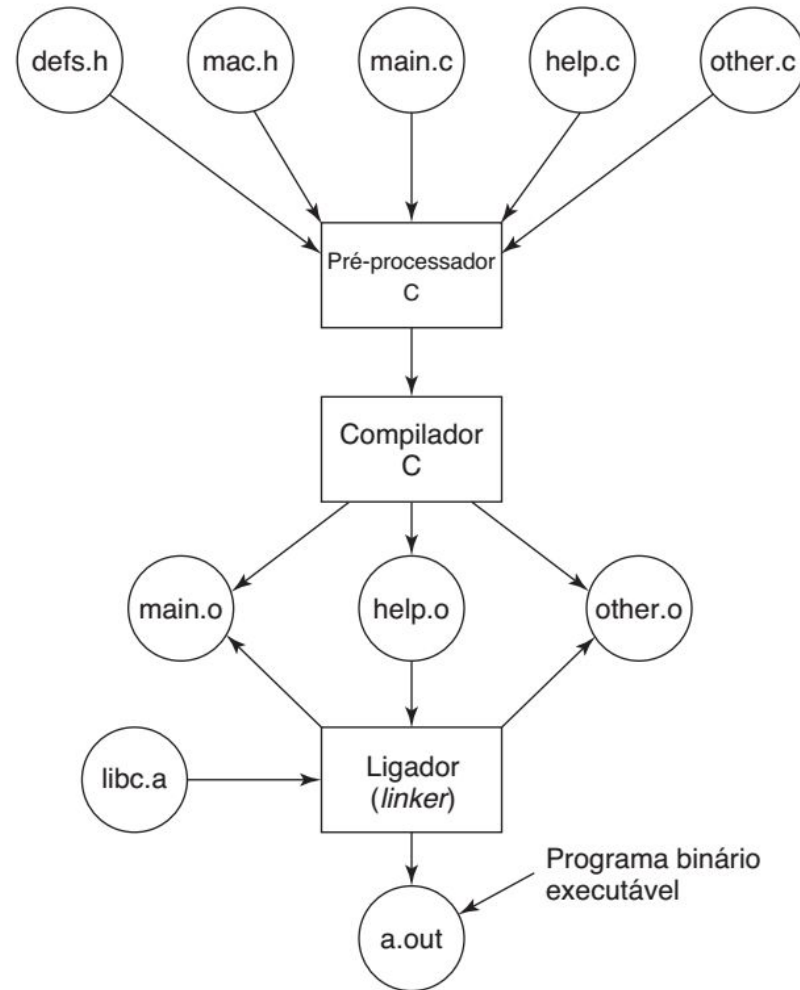
Como ocorre uma chamada de sistema

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 em equipe (1.0 pt):
executar 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

