

11711BCC008

Matheus José da Costa

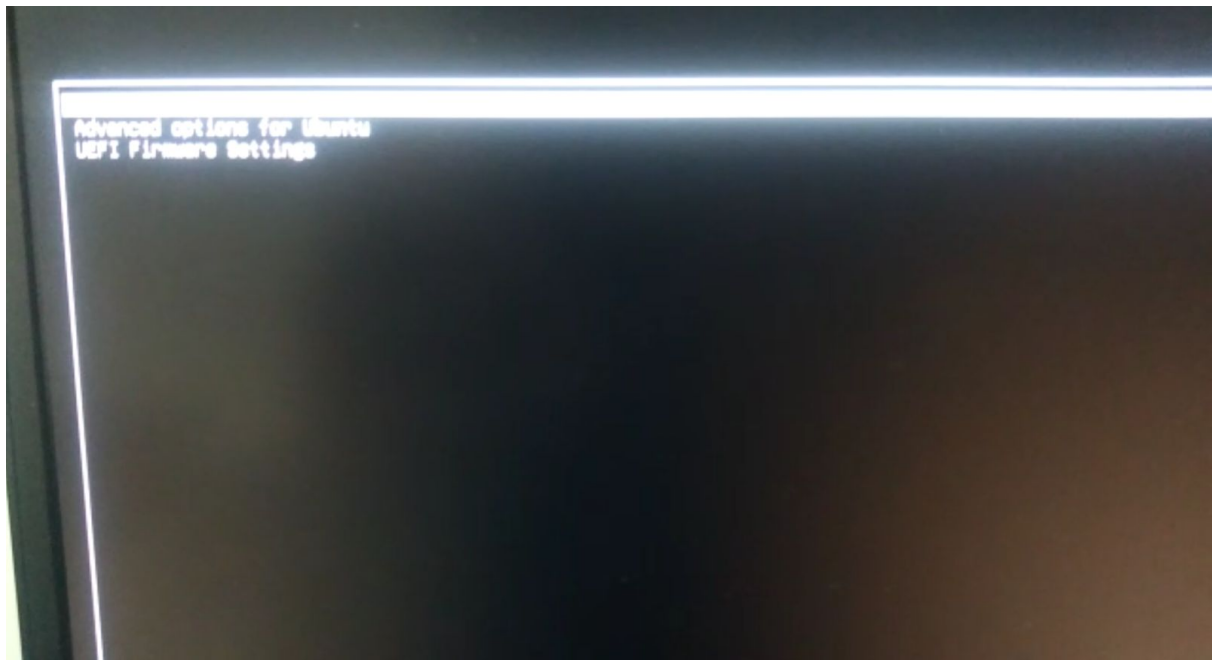
1-

A partir da energização do computador, então temos que ele começa a executar algumas tarefas. A primeira delas é o Power on System Test (POST) que basicamente verifica se os componentes básicos do sistema estão funcionando corretamente. Caso este falhe, então não avança para o próximo passo. Em caso de sucesso, então é carregado o Boot Manager, que é um programa que basicamente mostra quais são os Sistemas Operacionais (SO) disponíveis para serem selecionados. Ao selecionar algum SO, então é carregado, a partir do boot manager, o loader do SO. Ele é necessário para fazer o loader do kernel do SO, porque cada kernel tem sua particularidade de carregamento. E este fica no primeiro setor da camada de partição. Após isso, de fato é feita a inicialização do Sistema Operacional.

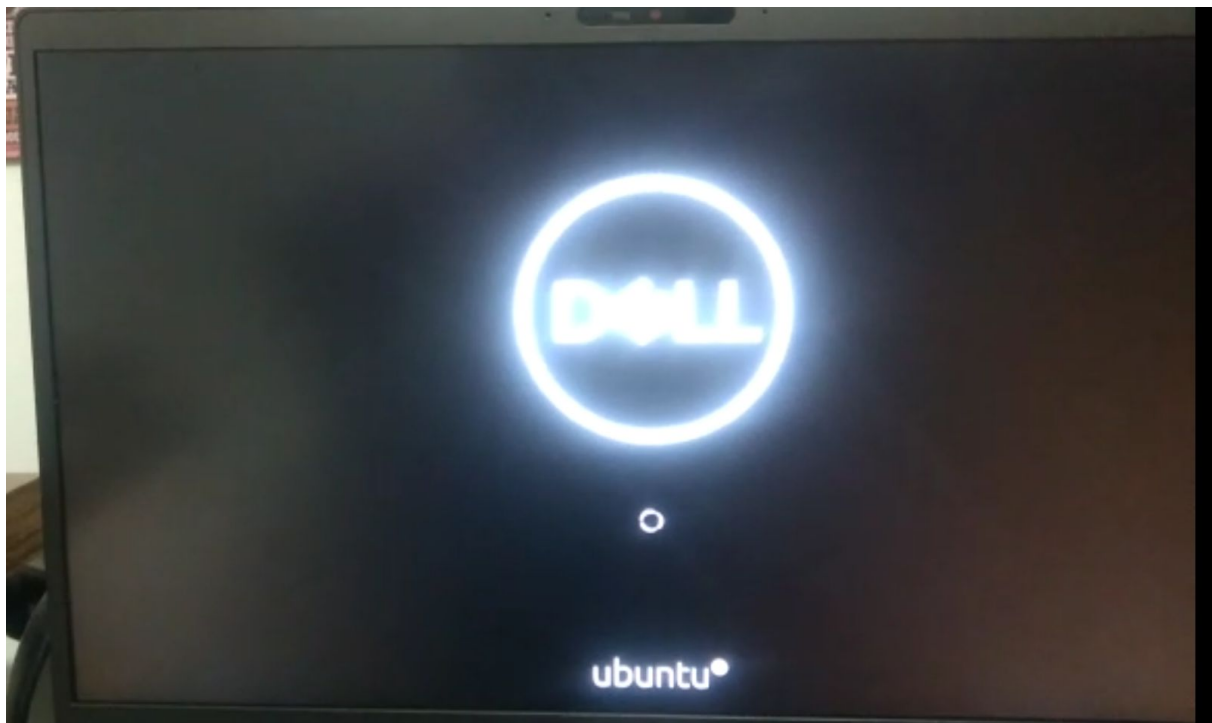
Etapa do POST:



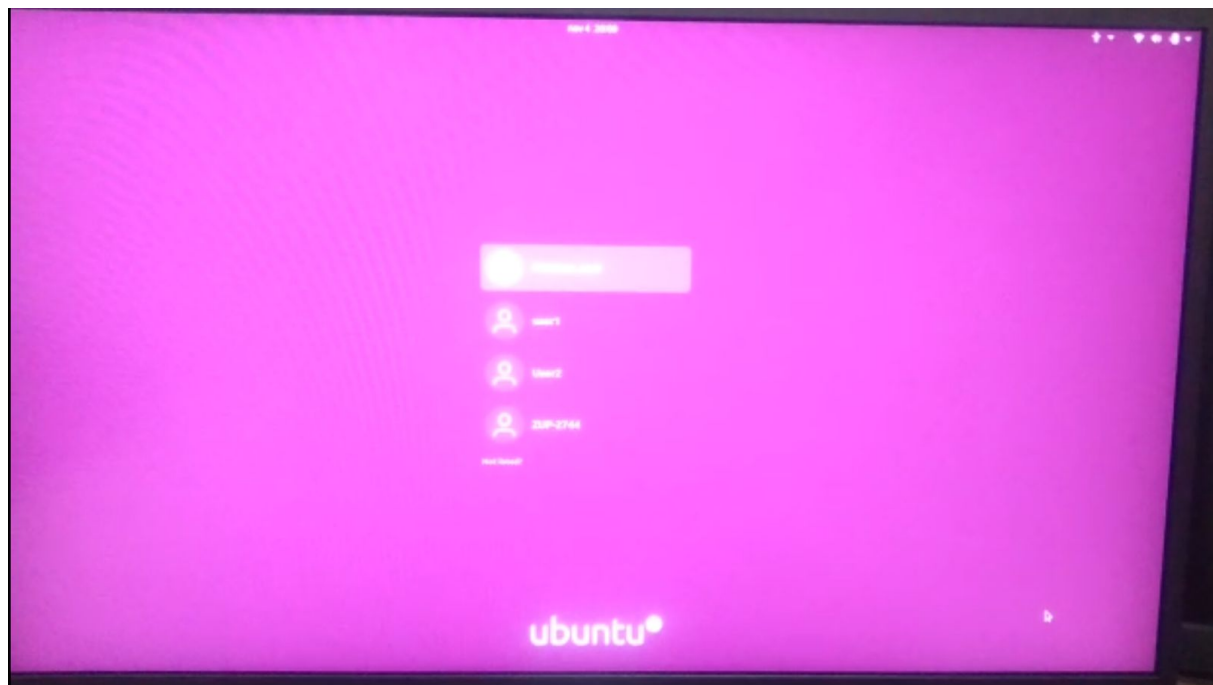
Etapa do Boot Manager:



Ao selecionar o SO, então o Boot Loader executa:



Por fim a inicialização do Sistema Operacional:




2-

E fabricante do Firmware é a Dell Inc. e a data é: 11/05/2020.

```
BIOS Information
  Vendor: Dell Inc.
  Version: 1.7.4
  Release Date: 05/11/2020
  Address: 0xF0000
  Runtime Size: 64 kB
  ROM Size: 32 MB
  Characteristics:
    PCI is supported
    PNP is supported
    BIOS is upgradeable
    BIOS shadowing is allowed
    Boot from CD is supported
    Selectable boot is supported
    EDD is supported
    Japanese floppy for NEC 9800 1.2 MB is supported (int 13h)
    5.25"/1.2 MB floppy services are supported (int 13h)
    3.5"/720 kB floppy services are supported (int 13h)
    3.5"/2.88 MB floppy services are supported (int 13h)
    Print screen service is supported (int 5h)
    8042 keyboard services are supported (int 9h)
    Serial services are supported (int 14h)
    Printer services are supported (int 17h)
    ACPI is supported
    USB legacy is supported
    Smart battery is supported
    BIOS boot specification is supported
    Function key-initiated network boot is supported
    Targeted content distribution is supported
    UEFI is supported
  BIOS Revision: 1.7

Handle 0x0001, DMI type 1, 27 bytes
System Information
  Manufacturer: Dell Inc.
  Product Name: Latitude 7300
  Version: Not Specified
  Serial Number: 22P2743
  UUID: 4c4c4544-0032-5010-8032-b2c04f373433
  Wake-up Type: Power Switch
  SKU Number: 08E0
```

4-



Device Name	zup-2744 >
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Memory	15,5 GiB
Processor	Intel® Core™ i7-8665U CPU @ 1.90GHz × 8
Graphics	Mesa Intel® UHD Graphics 620 (WHL GT2)
Disk Capacity	512,1 GB

OS Name	Ubuntu 20.04.1 LTS
OS Type	64-bit
GNOME Version	3.36.3
Windowing System	X11
Software Updates	>

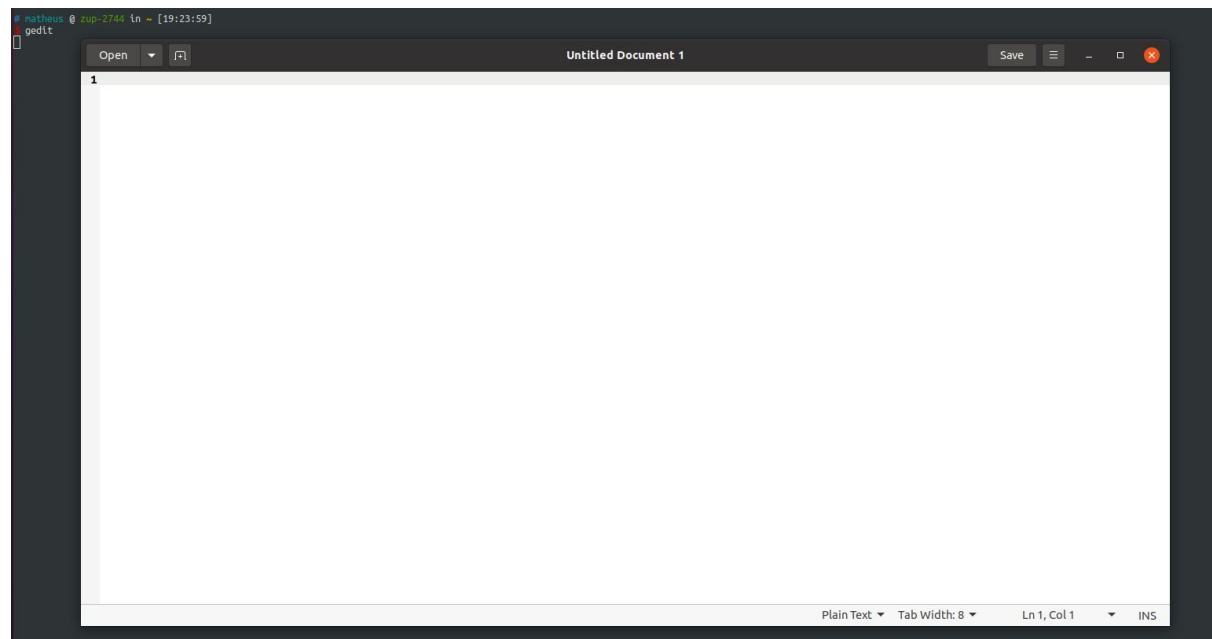
5-

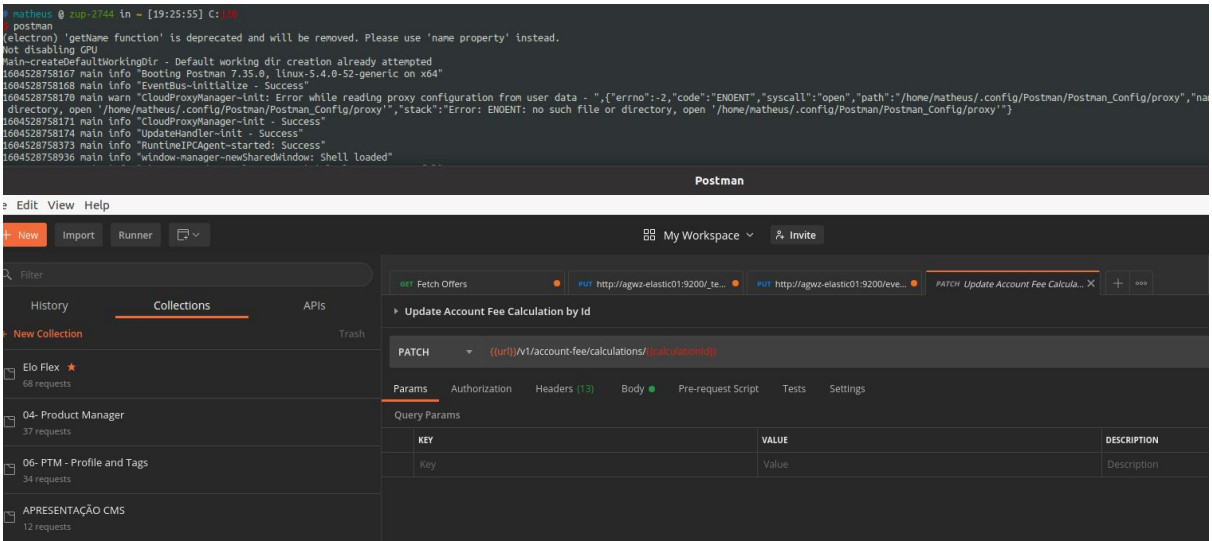
O meu sistema operacional de fato é multiusuário, utilizo o Ubuntu 20.04

```
user1@zup-2744:~$  
  
user2@zup-2744:~$  
  
# matheus @ zup-2744 in ~ [19:22:54]  
# w -f  
19:22:55 up 10:10, 3 users, load average: 1,86, 1,82, 1,51  
USER      TTY      LOGING   IDLE   JCPU   PCPU  WHAT  
matheus   :0        09:12   ?xdm?  5:14m  0.00s /usr/lib/gdm3/gdm-x-session --run-script env GNOME_SHELL_SESSION_MODE=ubuntu /usr/bin/gnome-session --systemd --session=ubuntu  
user1     pts/2    19:22   26.00s  0.02s  0.02s -bash  
user2     pts/5    19:22   3.00s   0.03s  0.03s -bash  
# matheus @ zup-2744 in ~ [19:23:59]  
#
```

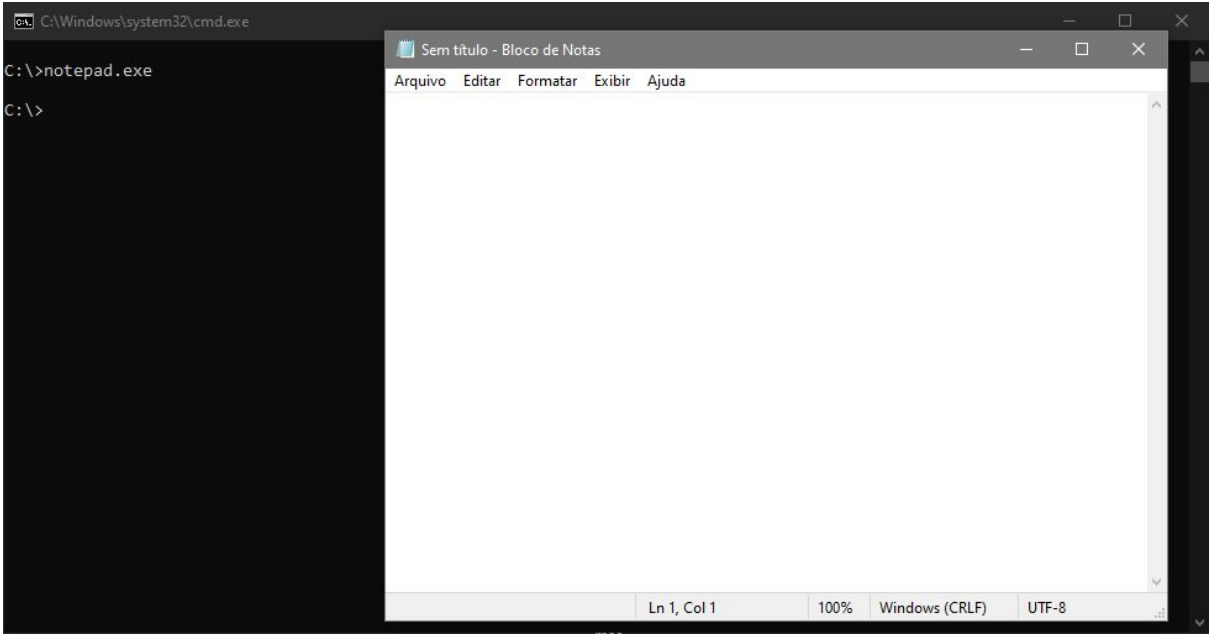
6-

No Linux:



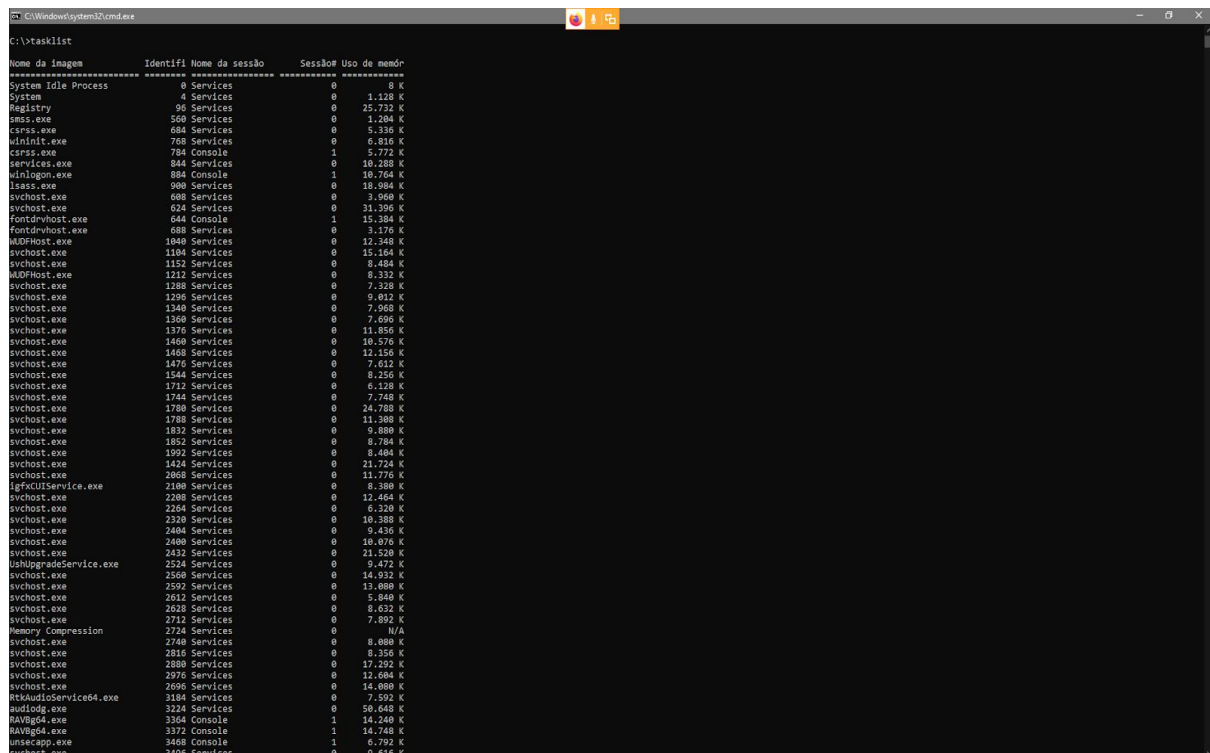


No Windows:



[illegible]

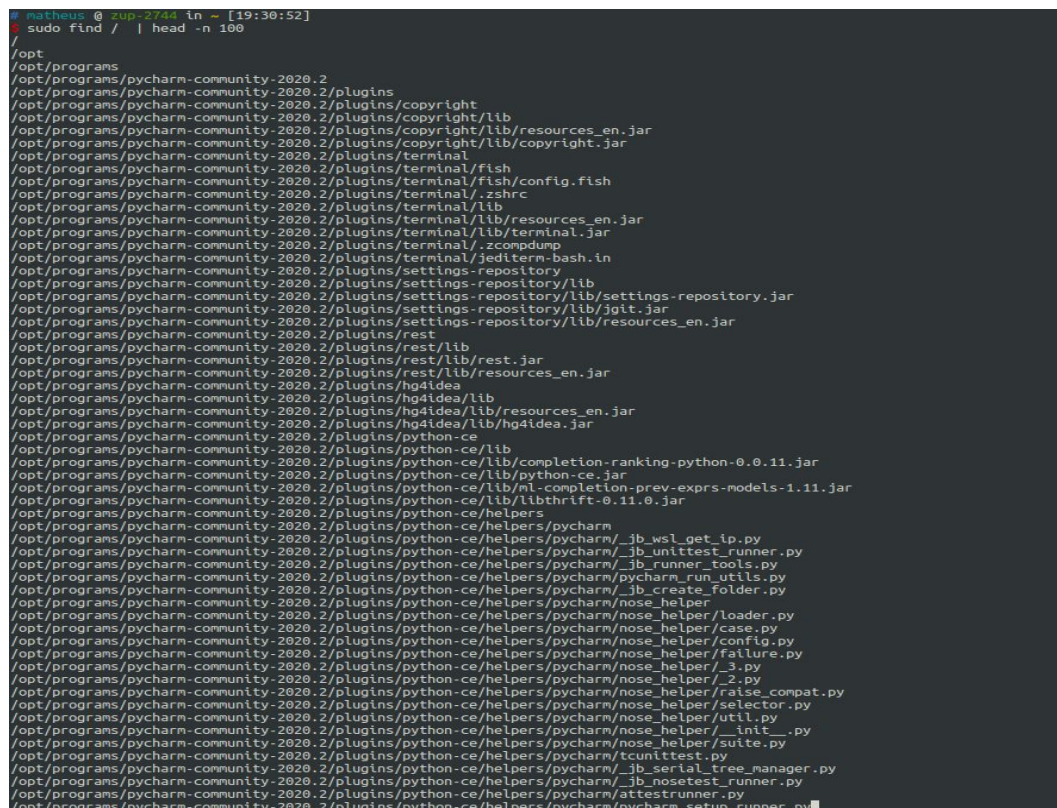
No Windows:



A screenshot of a Windows command prompt window showing the output of the 'tasklist' command. The window title is 'C:\Windows\system32\cmd.exe'. The output is a table with columns: Nome da Imagem, Identifil, Nome da sessão, Sessão, and Uso de memória. It lists various system and user processes along with their PIDs, session IDs, and memory usage.

Nome da Imagem	Identifil	Nome da sessão	Sessão	Uso de memória
System Idle Process	0	Services	0	0 K
System	4	Services	0	1.128 K
Registry	56	Services	0	25.732 K
smss.exe	568	Services	0	1.204 K
csrss.exe	684	Services	0	5.336 K
wininit.exe	768	Services	0	6.816 K
csrss.exe	784	Console	1	5.772 K
services.exe	844	Services	0	10.288 K
winlogon.exe	884	Console	1	10.764 K
lsass.exe	960	Services	0	18.984 K
svchost.exe	680	Services	0	3.960 K
svchost.exe	624	Services	0	31.396 K
fontdrvhost.exe	644	Console	1	15.884 K
fontdrvhost.exe	688	Services	0	3.176 K
WUDFHost.exe	1040	Services	0	12.348 K
svchost.exe	1184	Services	0	15.184 K
svchost.exe	1152	Services	0	5.484 K
WUDFHost.exe	1212	Services	0	8.332 K
svchost.exe	1280	Services	0	7.328 K
svchost.exe	1280	Services	0	9.012 K
svchost.exe	1340	Services	0	7.968 K
svchost.exe	1360	Services	0	7.696 K
svchost.exe	1376	Services	0	11.856 K
svchost.exe	1400	Services	0	10.576 K
svchost.exe	1468	Services	0	12.156 K
svchost.exe	1476	Services	0	7.612 K
svchost.exe	1544	Services	0	7.256 K
svchost.exe	1712	Services	0	6.128 K
svchost.exe	1744	Services	0	7.748 K
svchost.exe	1780	Services	0	24.720 K
svchost.exe	1780	Services	0	11.308 K
svchost.exe	1832	Services	0	9.880 K
svchost.exe	1832	Services	0	8.784 K
svchost.exe	1992	Services	0	8.484 K
svchost.exe	1424	Services	0	21.724 K
svchost.exe	2068	Services	0	11.776 K
lgfxcuiService.exe	2100	Services	0	8.380 K
svchost.exe	2280	Services	0	12.464 K
svchost.exe	2404	Services	0	6.340 K
svchost.exe	2350	Services	0	10.388 K
svchost.exe	2404	Services	0	9.436 K
svchost.exe	2480	Services	0	10.076 K
svchost.exe	2432	Services	0	21.520 K
ushellupgradeService.exe	2524	Services	0	9.472 K
svchost.exe	2560	Services	0	14.932 K
svchost.exe	2592	Services	0	13.680 K
svchost.exe	2612	Services	0	5.840 K
svchost.exe	2628	Services	0	8.632 K
svchost.exe	2712	Services	0	7.892 K
Memory Compression	2724	Services	0	N/A
svchost.exe	2740	Services	0	8.080 K
svchost.exe	2816	Services	0	8.336 K
svchost.exe	2880	Services	0	17.292 K
svchost.exe	2976	Services	0	12.684 K
svchost.exe	2696	Services	0	14.080 K
stmAudioService64.exe	3184	Services	0	7.592 K
audiologd.exe	3224	Services	0	50.648 K
RAVG64.exe	3364	Console	1	14.240 K
RAVG64.exe	3372	Console	1	14.748 K
unsecapp.exe	3408	Console	1	6.792 K
svchost.exe	3406	Services	0	9.616 K

8- Para listar todos os arquivos do meu computador, no Linux, utilizei o comando **sudo find / | head -n 100** para que conseguisse listar as linhas iniciais do retorno. Porém, para de fato listar todos os arquivos, bastaria um **sudo find /**



A screenshot of a Linux terminal window showing the output of the command 'sudo find / | head -n 100'. The prompt is 'matheus@zup-2744 in ~ [19:30:52]'. The output lists the first 100 files found by the 'find' command, starting from the root directory and including various system files and directories.

```
matheus@zup-2744 in ~ [19:30:52]
$ sudo find / | head -n 100
/
/opt
/opt/programs
/opt/programs/pycharm-community-2020.2
/opt/programs/pycharm-community-2020.2/plugins
/opt/programs/pycharm-community-2020.2/plugins/copyright
/opt/programs/pycharm-community-2020.2/plugins/copyright/lib
/opt/programs/pycharm-community-2020.2/plugins/copyright/lib/resources_en.jar
/opt/programs/pycharm-community-2020.2/plugins/copyright/lib/copyright.jar
/opt/programs/pycharm-community-2020.2/plugins/terminal
/opt/programs/pycharm-community-2020.2/plugins/terminal/fish
/opt/programs/pycharm-community-2020.2/plugins/terminal/fish/config.fish
/opt/programs/pycharm-community-2020.2/plugins/terminal/.zshrc
/opt/programs/pycharm-community-2020.2/plugins/terminal/lib
/opt/programs/pycharm-community-2020.2/plugins/terminal/lib/resources_en.jar
/opt/programs/pycharm-community-2020.2/plugins/terminal/lib/terminal.jar
/opt/programs/pycharm-community-2020.2/plugins/terminal/.zcompdump
/opt/programs/pycharm-community-2020.2/plugins/terminal/jediterm-bash.in
/opt/programs/pycharm-community-2020.2/plugins/settings-repository
/opt/programs/pycharm-community-2020.2/plugins/settings-repository/lib
/opt/programs/pycharm-community-2020.2/plugins/settings-repository/lib/settings-repository.jar
/opt/programs/pycharm-community-2020.2/plugins/settings-repository/lib/jgit.jar
/opt/programs/pycharm-community-2020.2/plugins/settings-repository/lib/resources_en.jar
/opt/programs/pycharm-community-2020.2/plugins/rest
/opt/programs/pycharm-community-2020.2/plugins/rest/lib
/opt/programs/pycharm-community-2020.2/plugins/rest/lib/rest.jar
/opt/programs/pycharm-community-2020.2/plugins/rest/lib/resources_en.jar
/opt/programs/pycharm-community-2020.2/plugins/hg4idea
/opt/programs/pycharm-community-2020.2/plugins/hg4idea/lib
/opt/programs/pycharm-community-2020.2/plugins/hg4idea/lib/resources_en.jar
/opt/programs/pycharm-community-2020.2/plugins/hg4idea/lib/hg4idea.jar
/opt/programs/pycharm-community-2020.2/plugins/python-ce
/opt/programs/pycharm-community-2020.2/plugins/python-ce/lib
/opt/programs/pycharm-community-2020.2/plugins/python-ce/lib/completion-ranking-python-0.0.11.jar
/opt/programs/pycharm-community-2020.2/plugins/python-ce/lib/python-ce.jar
/opt/programs/pycharm-community-2020.2/plugins/python-ce/lib/ml-completion-prev-exprs-models-1.11.jar
/opt/programs/pycharm-community-2020.2/plugins/python-ce/lib/libthrift-0.11.0.jar
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/_jb_wsl_get_ip.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/_jb_unittest_runner.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/_jb_runner_tools.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/pycharm_run_utils.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/_jb_create_folder.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/loader.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/case.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/config.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/failure.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/_3.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/_2.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/raise_compat.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/selector.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/_init_.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/nose_helper/suite.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/tcunittest.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/_jb_serial_tree_manager.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/_jb_nosetest_runner.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/attestrunner.py
/opt/programs/pycharm-community-2020.2/plugins/python-ce/helpers/pycharm/pycharm_setup_runner.py
```


No Windows:

```
C:\Windows\system32\cmd.exe
3 arquivo(s)      31.734 bytes

C:\>dir c:\ /s | more
O volume na unidade c não tem nome.
O Número de Série do Volume é FAFF-1871

Pasta de c:\

18/03/2020 19:10 <DIR>      Intel
18/03/2019 01:52 <DIR>      PerfLogs
20/10/2020 18:02 <DIR>      Program Files
20/10/2020 18:02 <DIR>      Program Files (x86)
06/10/2020 23:43 <DIR>      Riot Games
18/03/2020 17:58 <DIR>      Users
18/10/2020 21:51 <DIR>      Windows
0 arquivo(s)      0 bytes

Pasta de c:\$Recycle.Bin\S-1-5-21-129626754-3623444888-431006921-3235

18/10/2020 16:22      120 $I05HMC.zip
18/10/2020 16:22      192 $I167N2.rar
09/10/2020 23:26      184 $I13075
18/10/2020 16:22      188 $I1VW57.pdf
18/10/2020 17:44      130 $I25C2IP.mkv
18/10/2020 17:44      138 $I2BN84H.mkv
07/10/2020 22:57      178 $I2T6078.exe
18/10/2020 22:23      156 $I4KFKC3.pdf
18/10/2020 17:44      138 $I50NP88.mkv
07/10/2020 22:57      148 $I76CTD8.docx
07/10/2020 22:57      134 $I7PQ2R2.pdf
18/10/2020 22:23      124 $I8BUSSA.jpg
18/10/2020 22:23      158 $I8KQ0Q1.pdf
18/10/2020 22:23      178 $I86QV3.exe
18/10/2020 16:22      148 $I8F7I77.pdf
18/10/2020 16:22      108 $I7ZHL5P.pdf
07/10/2020 21:57      174 $I1VYV5M.odt
18/10/2020 16:22      134 $I86QW6.pdf
07/10/2020 22:57      138 $I14X12K.txt
07/10/2020 22:57      136 $I1PWV31.exe
07/10/2020 22:57      148 $I1Q1RQ0.pdf
18/10/2020 21:23      150 $I86VNF.pdf
18/10/2020 16:22      172 $I1U4V1C.pdf
09/10/2020 23:26      134 $I1XV8H8.exe
07/10/2020 23:56      3.358 $R05HMC.zip
09/10/2020 23:21      436.340.458 $R12G7N2.rar
09/10/2020 23:26 <DIR>      $R13075
07/10/2020 22:59      59.423 $R13VW57.pdf
18/10/2020 17:42      6.596.495 $R25C2IP.mkv
18/10/2020 17:42      457.473 $R2BN84H.mkv
02/10/2020 17:48      102.029.880 $R2T6078.exe
18/10/2020 19:34      71.804 $R4KFKC3.pdf
18/10/2020 17:44      2.816.499 $R50NP88.mkv
07/10/2020 13:53      11.053 $R76CTD8.docx
07/10/2020 22:38      472.672 $R7PQ2R2.pdf
18/10/2020 16:42      1.366.136 $R8BUSSA.jpg
18/10/2020 17:14      890.203 $R8KQ0Q1.pdf
18/10/2020 17:32      74.839.368 $R858CV3.exe
07/10/2020 22:48      60.150 $R8F7I77.pdf
07/10/2020 22:47      499.027 $R7ZHL5P.pdf
08/09/2020 22:51      18.196 $R1VYV5M.odt
07/10/2020 23:54      472.072 $R86QW6.pdf
01/10/2020 20:23      1.233.365 $R14X12K.txt
06/10/2020 23:42      103.485.704 $R1PWV31.exe
07/10/2020 22:55      147.003 $R1Q1RQ0.pdf
07/10/2020 21:34      761.959 $R86VNF.pdf
07/10/2020 22:57      147.003 $R1U4V1C.pdf
```

9-

Para listar a memória secundária, no Linux, utilizei o comando **df -h**

```
# matheus @ zup-2744 in ~ [19:33:56]
$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            7,7G   0  7,7G   0% /dev
tmpfs           1,6G   2,4M  1,6G   1% /run
/dev/nvme0n1p2 468G   57G  388G  13% /
tmpfs           7,8G  747M   7,0G  10% /dev/shm
tmpfs           5,0M   4,0K   5,0M   1% /run/lock
tmpfs           7,8G   0   7,8G   0% /sys/fs/cgroup
/dev/loop1       98M   98M     0 100% /snap/core/10126
/dev/loop2      147M  147M     0 100% /snap/code/47
/dev/loop4       57M   57M     0 100% /snap/bitwarden/31
/dev/loop3      143M  143M     0 100% /snap/code/48
/dev/loop7       98M   98M     0 100% /snap/core/10185
/dev/loop6       61M   61M     0 100% /snap/core20/634
/dev/loop5       56M   56M     0 100% /snap/core18/1932
/dev/loop8       63M   63M     0 100% /snap/gtk-common-themes/1506
/dev/loop9       57M   57M     0 100% /snap/bitwarden/30
/dev/loop9p9     31M   31M     0 100% /snap/snapd/9607
/dev/loop11      50M   50M     0 100% /snap/snap-store/467
/dev/loop10     218M  218M     0 100% /snap/gnome-3-34-1804/60
/dev/loop12     256M  256M     0 100% /snap/gnome-3-34-1804/36
/dev/loop13     164M  164M     0 100% /snap/spotify/41
/dev/loop14      31M   31M     0 100% /snap/snapd/9721
/dev/loop15     180M  180M     0 100% /snap/telegram-desktop/2185
/dev/loop17     162M  162M     0 100% /snap/gnome-3-28-1804/128
/dev/loop16      58M   58M     0 100% /snap/discord/115
/dev/loop19     163M  163M     0 100% /snap/gnome-3-28-1804/145
/dev/loop18      56M   56M     0 100% /snap/core18/1885
/dev/loop20      51M   51M     0 100% /snap/snap-store/481
/dev/loop21     180M  180M     0 100% /snap/telegram-desktop/2170
/dev/loop22     170M  170M     0 100% /snap/spotify/42
/dev/loop23     184M  184M     0 100% /snap/vidcutter/14
/dev/nvme0n1p1  511M   7,8M  504M   2% /boot/efi
tmpfs           1,6G   168K  1,6G   1% /run/user/1001
```

Para listar a memória primária, no Linux, utilizei o comando **free -m**

```
# matheus @ zup-2744 in ~ [19:30:59]
$ free -m
```

	total	used	free	shared	buff/cache	available
Mem:	15823	6045	1254	1707	8523	7741
Swap:	2047	0	2047			

Para listar a memória secundária, no Windows, utilizei o comando **wmic OS get FreePhysicalMemory /Value**

Para listar a memória primária, no Windows, utilizei o comando **fsutil volume diskfree c:**

```
C:\Windows\system32>wmic OS get FreePhysicalMemory /Value

FreePhysicalMemory=10809924

C:\Windows\system32>fsutil volume diskfree c:
Total de bytes livres      : 22.505.357.312 ( 21,0 GB)
Total de bytes             : 191.026.425.856 (177,9 GB)
Total de bytes livres de cotas : 22.505.357.312 ( 21,0 GB)

C:\Windows\system32>
```

10-

Segue o código com alguns prints da execução do programa:

Para executá-lo no Linux:

É necessário instalar o seguinte antes de compilar:

sudo apt install libreadline-dev

Para compilar:

gcc -o shell shell-program.c -lreadline

```

#include <stdio.h>
#include <time.h>
#include <dirent.h>
#include <string.h>

#include <readline/readline.h>

#define BADKEY -1
#define EXIT 0
#define CLS 1
#define DIRETORIO 2
#define DATE 3
#define TIME 4
#define HELP 5

typedef struct { char *key; int val; } key_value_struct;

static key_value_struct helptable[] = {
    { "exit", EXIT }, { "cls", CLS }, { "dir", DIRETORIO }, { "date",
DATE }, { "time", TIME }, { "help", HELP }
};

#define NUMBER_KEYS (sizeof(helptable)/sizeof(key_value_struct))

int keyfromstring(char *key)
{
    int i;
    for (i=0; i < NUMBER_KEYS; i++) {
        key_value_struct *key_value = malloc(sizeof(key_value_struct));
        *key_value = helptable[i];
        if (strcmp(key_value->key, key) == 0)
            return key_value->val;
    }
    return BADKEY;
}

int readInput(char* str) {
    char* buf;

    buf = readline("\nmini-shell$ ");
    if (strlen(buf) != 0) {
        strcpy(str, buf);
    }
}

```

```

        return 0;
    } else {
        return 1;
    }
}

int clear_screen() {
    printf("\e[1;1H\e[2J");

    return 0;
}

struct tm datetime() {
    time_t t = time(NULL);
    struct tm time_s = *localtime(&t);

    return time_s;
}

int list() {
    DIR *directory;
    struct dirent *ep;
    directory = opendir(".");

    if (directory != NULL) {
        while (ep = readdir(directory)) {
            if (ep->d_type == DT_DIR)
                printf("%s (dir)\n", ep->d_name);
            else
                printf("%s\n", ep->d_name);
        }
        closedir(directory);

        return 0;
    } else
        return -1;
}

void help() {
    printf("Available commands:\n"
           "cls - clear screen like 'clear' command\n"
           "date - show current date \n"
           "time - show current time \n"
    );
}

```

```

        "dir - show files and folders in current directory like 'ls'
command\n"
        "help - print this message\n"
        "exit - exit from this program\n");
}

int main() {

    char command[50];
    struct tm time_s;

    while(1) {

        readInput(command);

        switch(keyfromstring(command)) {
            case(0):
                return -1;
            case(1):
                clear_screen(); continue;
            case(2):
                list(); continue;
            case(3):
                time_s = datetime();
                printf("%02d/%02d/%02d\n", time_s.tm_mday,
                    time_s.tm_mon + 1,
                    time_s.tm_year + 1900);
                continue;
            case(4):
                time_s = datetime();
                printf("%02d/%02d/%02d\n", time_s.tm_hour,
time_s.tm_min,time_s.tm_sec);
                continue;
            case(5):
                help();
                continue;
            default:
                printf("command not found: %s\n", command);
        }
    }

    return 0;
}

```


Execução:

```
mini-shell$  
Available commands:  
cls - clear screen like 'clear' command  
date - show current date  
time - show current time  
dir - show files and folders in current directory like 'ls' command  
help - print this message  
exit - exit from this program  
  
mini-shell$  
Available commands:  
cls - clear screen like 'clear' command  
date - show current date  
time - show current time  
dir - show files and folders in current directory like 'ls' command  
help - print this message  
exit - exit from this program  
  
mini-shell$  
Available commands:  
cls - clear screen like 'clear' command  
date - show current date  
time - show current time  
dir - show files and folders in current directory like 'ls' command  
help - print this message  
exit - exit from this program  
  
mini-shell$ cls
```

Após o comando cls:

```
mini-shell$
```

Comando dir:

```
mini-shell$ dir
.. (dir)
. (dir)
shell-program.c
shell

mini-shell$
```

Comando date:

```
mini-shell$ date
04/11/2020

mini-shell$
```

Comando time:

```
mini-shell$ time
21/26/24

mini-shell$
```