Name: Basil khowaja (bk08432)
Section: T3

Chapter 3 code results:

```
bk08432@DESKTOP-BRH2KGB:~$ cal
    August 2024
Su Mo Tu We Th Fr Sa
             1  2  3
 4  5  6  7  8  9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30 31

bk08432@DESKTOP-BRH2KGB:~$ date
Tue Aug 20 15:58:22 PKT 2024
bk08432@DESKTOP-BRH2KGB:~$ whoami
bk08432
bk08432@DESKTOP-BRH2KGB:~$ hostname
DESKTOP-BRH2KGB
```

```
bk08432@DESKTOP-BRH2KGB:~$ df
Filesystem      1K-blocks      Used  Available Use% Mounted on
none              4000784         4    4000780   1% /mnt/wsl
drivers         436553696 221152380  215401316  51% /usr/lib/wsl/drivers
none              4000784         0    4000784   0% /usr/lib/modules
none              4000784         0    4000784   0% /usr/lib/modules/5.15.15
3.1-microsoft-standard-WSL2
/dev/sdc       1055762868   1876124 1000183272   1% /
none              4000784        76    4000708   1% /mnt/wslg
none              4000784         0    4000784   0% /usr/lib/wsl/lib
rootfs            3997432      2080    3995352   1% /init
none              4000784       828    3999956   1% /run
none              4000784         0    4000784   0% /run/lock
none              4000784         0    4000784   0% /run/shm
tmpfs                4096         0       4096   0% /sys/fs/cgroup
none              4000784       548    4000236   1% /mnt/wslg/versions.txt
none              4000784       548    4000236   1% /mnt/wslg/doc
C:\             436553696 221152380  215401316  51% /mnt/c
E:\             464759804  13625960  451133844   3% /mnt/e
F:\             511998972  60804556  451194416  12% /mnt/f
G:\              51199996   7703296   43496700  16% /mnt/g
snapfuse            76032     76032          0 100% /snap/core22/1380
snapfuse            76032     76032          0 100% /snap/core22/1439
snapfuse            12288     12288          0 100% /snap/nmap/3470
snapfuse            12288     12288          0 100% /snap/nmap/3514
snapfuse            39808     39808          0 100% /snap/snapd/21759
tmpfs              800156        16     800140   1% /run/user/1002
```

```
bk08432@DESKTOP-BRH2KGB:/$ free
               total        used        free      shared  buff/cache   avail
able
Mem:         8001568      671164     7358780        3716      209580     733
0404
Swap:        2097152           0     2097152
```

```
bk08432@DESKTOP-BRH2KGB:/$ date --utc
Tue Aug 20 11:06:27 UTC 2024
bk08432@DESKTOP-BRH2KGB:/$ date -u
Tue Aug 20 11:06:33 UTC 2024
```

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```
bk08432@DESKTOP-BRH2KGB:/$ who
who             whoami          whoami.exe
```

```
bk08432@DESKTOP-BRH2KGI
MAN(1)                    Manual pager utils                    MAN(1)

NAME
       man - an interface to the system reference manuals

SYNOPSIS
       man [man options] [[section] page ...] ...
       man -k [apropos options] regexp ...
       man -K [man options] [section] term ...
       man -f [whatis options] page ...
       man -l [man options] file ...
       man -w|-W [man options] page ...

DESCRIPTION
       man  is the system's manual pager.  Each page argument given to man
       is normally the name of a program, utility or function.  The manual
       page associated with each of these arguments is then found and dis-
       played.  A section, if provided, will direct man to  look  only  in
       that section of the manual.  The default action is to search in all
       of  the  available  sections following a pre-defined order (see DE-
       FAULTS), and to show only the first page found, even if page exists
       in several sections.

       The table below shows the section numbers of the manual followed by
       the types of pages they contain.

       1   Executable programs or shell commands
       2   System calls (functions provided by the kernel)
       3   Library calls (functions within program libraries)
       4   Special files (usually found in /dev)
       5   File formats and conventions, e.g. /etc/passwd
       6   Games
       7   Miscellaneous (including macro packages and conventions),  e.g.
           man(7), groff(7), man-pages(7)
       8   System administration commands (usually only for root)
       9   Kernel routines [Non standard]

       A manual page consists of several sections.

       Conventional  section  names include NAME, SYNOPSIS, CONFIGURATION,
 Manual page man(1) line 1 (press h for help or q to quit)
```

```
bk08432@DESKTOP-BRH2KGB:/$ whatis ls
ls (1)                   - list directory contents
```

```
bk08432@DESKTOP-BRH2KGB:/$ whatis ls cp rm mv
ls (1)                   - list directory contents
cp (1)                   - copy files and directories
rm (1)                   - remove files or directories
mv (1)                   - move (rename) files
```

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```
bk08432@DESKTOP-BRH2KGB:/$ hostname --help
Usage: hostname [-b] {hostname|-F file}         set host name (from file)
       hostname [-a|-A|-d|-f|-i|-I|-s|-y]       display formatted name
       hostname                                 display host name

       {yp,nis,}domainname {nisdomain|-F file}  set NIS domain name (from fi
le)
       {yp,nis,}domainname                      display NIS domain name

       dnsdomainname                            display dns domain name

       hostname -V|--version|-h|--help          print info and exit

Program name:
       {yp,nis,}domainname=hostname -y
       dnsdomainname=hostname -d

Program options:
    -a, --alias            alias names
    -A, --all-fqdns        all long host names (FQDNs)
    -b, --boot             set default hostname if none available
    -d, --domain           DNS domain name
    -f, --fqdn, --long     long host name (FQDN)
    -F, --file             read host name or NIS domain name from given file
    -i, --ip-address       addresses for the host name
    -I, --all-ip-addresses all addresses for the host
    -s, --short            short host name
    -y, --yp, --nis        NIS/YP domain name

Description:
   This command can get or set the host name or the NIS domain name. You can
   also get the DNS domain or the FQDN (fully qualified domain name).
   Unless you are using bind or NIS for host lookups you can change the
   FQDN (Fully Qualified Domain Name) and the DNS domain name (which is
   part of the FQDN) in the /etc/hosts file.
```

First I created a cpu.c using the touch command, then using the nano command I edited the code in it, removed the sleep variable which was producing error since sleep is not recognized as a function on my Ubuntu LTS.

```
bk08432@DESKTOP-BRH2KGI
  GNU nano 7.2                          cpu.c
#include <stdio.h>
#include <stdlib.h>
#include <sys/time.h>
#include <assert.h>

int main(int argc, char *argv[]) {
    if (argc != 2) {
        fprintf(stderr, "Usage: cpu <string> \n");
        fprintf(stderr, "Example: cpu \"University\" \n");
        exit(1);
    }

    char *str = argv[1];

    while (1) {
        for (long long int i = 0; i <100000000; i++) {
        }
        printf("%s\n", str);
    }

    return 0;
}
```

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```
bk08432@DESKTOP-BRH2KGB:~$ nano cpu.c
bk08432@DESKTOP-BRH2KGB:~$ gcc -o cpu cpu.c -Wall
bk08432@DESKTOP-BRH2KGB:~$ ./cpu
Usage: cpu <string>
Example: cpu "University"
bk08432@DESKTOP-BRH2KGB:~$ ./cpu "Habib university"
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
Habib university
^C
bk08432@DESKTOP-BRH2KGB:~$
```

Q1)

`argc`: this actually counts the number of arguments passed to the program.
`argv[]`: It is An array of strings, where each string is one of the command line argument which we user are giving.

Q2)

There are two ways by which I think we can increase the printing delay, one is to increase the value of sleep_seconds variable. Like if we change it from 2 to 5 then it will print each point after 5 seconds. Other way is to increase the loop count inside the while loop statement.

Q3) What is a shell, and which shell are you in?

A shell is a program that provides an interface to us to interact with the operating system. It allows us to execute commands, run programs, and manage system resources by typing text commands.

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```
bk08432@DESKTOP-BRH2KGB:~$ echo $SHELL
/bin/bash
bk08432@DESKTOP-BRH2KGB:~$
```

This shows that right now I am in the bash shell.

Q4) What is a “Home Directory,” and what is your Home Directory?

A "Home Directory" is a personal directory assigned to each user on a computer system. It works like the user's default working directory, where we have full permissions to create, modify, and delete files and directories.

```
bk08432@DESKTOP-BRH2KGB:~$ echo $HOME
/home/bk08432
bk08432@DESKTOP-BRH2KGB:~$
```

Bk08432 is my home directory.

Q5) What’s a Working Directory and which directory are you in?

A Working Directory is the directory in the file system where we are currently operating.

```
bk08432@DESKTOP-BRH2KGB:~$ pwd
/home/bk08432
```

I am currently in the /home/bk08432 directory.

Q6) Differentiate between an ‘Absolute Path’ and a ‘Relative Path’?

An absolute path is the complete path from the root directory to a specific file or directory, starting with the root, and it uniquely identifies a location in the file system regardless of the current working directory. On other hand, relative path specifies a location relative to the current working directory, starting from where we are currently located. While absolute paths always point to the same location, relative paths are more flexible in that sense, depending on out current position in the directory structure.

Q7) What’s the largest file inside the directory “/usr/bin”?

```
bk08432@DESKTOP-BRH2KGB:~$ ls -lhS /usr/bin | grep -v '^total' | head -n 1
-rwxr-xr-x 1 root root     32M Apr 14 12:31 x86_64-linux-gnu-lto-dump-13
```

x86_64-linux-gnu-lto-dump-13 is 32 MB in size.

Q8) What’s the most recently created file inside the directory /usr/bin?

The command ``ls -lt'' displays the files in descending order (in long format) by time. Therefore we can get the most recently created file using this command. It can be modified to ``ls -lt | head -n 2'' to get the top most file which is shown below:

```
bk08432@DESKTOP-BRH2KGB:~$ ls /usr/bin -lt | head -n 2
total 136356
lrwxrwxrwx 1 root root           5 Jun 29 00:17 wslinfo -> /init
```

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Q9) List all the hidden files and directories in your home directory.

Using the ls –a command we can see the hidden directories which are shown below in my case

```
bk08432@DESKTOP-BRH2KGB:~$ ls -a
.               .lesshst                  cpu                                 moogi.sh      test.sh
..              .local                    cpu.c                               my.txt        textfile.txt
.bash_history   .motd_shown               geogebra_4.0.34.0+dfsg1-7_all.deb   myscript.sh   zaki.txt
.bash_logout    .profile                  hellothere.sh                       pos.sh
.bashrc         .sudo_as_admin_successful interactiveshell.sh                 shelltest.sh
.cache          .viminfo                  m.sh                                snap
.landscape      basil.txt                 meesum.txt                          test
```

Q10) What does the command 'file' do?

The command ``file'' is used to find a file type. It works by running various tests to determine the file type and its data. The description can be further viewed by the command ``man file''.

Q11) Search for the "-h" option of "ls." What do they do? Use them

Using ``man ls -h'', we can find that the -h option displays the file in human readable format. Running the command ``ls -h'' outputs the following files:

```
bk08432@DESKTOP-BRH2KGB:~$ ls -h
basil.txt  geogebra_4.0.34.0+dfsg1-7_all.deb  m.sh        my.txt       shelltest.sh  test.sh
cpu        hellothere.sh                      meesum.txt  myscript.sh  snap          textfile.txt
cpu.c      interactiveshell.sh                moogi.sh    pos.sh       test          zaki.txt
```

Q12) Make the directory "mine/subdir/subsubdir" using one command only.

```
bk08432@DESKTOP-BRH2KGB:~$ mkdir -p mine/subdir/subsubdir
```

Q13) While staying in your home directory, create an empty file dummy.txt in mine/subdir/subsubdir.

```
bk08432@DESKTOP-BRH2KGB:~$ touch ~/mine/subdir/subsubdir/dummy.txt
bk08432@DESKTOP-BRH2KGB:~$
```

Q14) While staying in your home directory, copy the files zip, zipgrep, zipinfo from /usr/bin to mine/subdir/subsubdir

```
bk08432@DESKTOP-BRH2KGB:~$ cp /usr/bin/zip /usr/bin/zipgrep /usr/bin/zipinfo ~/mine/subdir/subsubdir/
```

Q15) Move all files from mine/subdir/subsubdir to mine/subdir/

```
bk08432@DESKTOP-BRH2KGB:~$ mv ~/mine/subdir/subsubdir/* ~/mine/subdir/
```

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Q16) List all the files in /etc whose second letter is c.

```
bk08432@DESKTOP-BRH2KGB:~$ ls /etc/?c*
/etc/ucf.conf  /etc/vconsole.conf

/etc/dconf:
db

/etc/rc0.d:
K01unattended-upgrades  K01uuidd

/etc/rc1.d:
K01uuidd

/etc/rc2.d:
S01apport  S01console-setup.sh  S01cron  S01dbus  S01rsync  S01unattended-upgrades  S01uuidd

/etc/rc3.d:
S01apport  S01console-setup.sh  S01cron  S01dbus  S01rsync  S01unattended-upgrades  S01uuidd

/etc/rc4.d:
S01apport  S01console-setup.sh  S01cron  S01dbus  S01rsync  S01unattended-upgrades  S01uuidd

/etc/rc5.d:
S01apport  S01console-setup.sh  S01cron  S01dbus  S01rsync  S01unattended-upgrades  S01uuidd

/etc/rc6.d:
K01unattended-upgrades  K01uuidd

/etc/rcS.d:
S01apparmor  S01keyboard-setup.sh  S01kmod  S01procps  S01x11-common
bk08432@DESKTOP-BRH2KGB:~$
```

Q17) Copy all of them to mine/subdir. Then delete all files that contain a digit.

First we will Copy all files in /etc whose second letter is c to mine/subdir using this command:

cp /etc/?c* ~/mine/subdir/

then we will Delete all files in mine/subdir that contain a digit using this command:

rm ~/mine/subdir/*[0-9]*

Q18) Delete the mine/subdir/ directory

we can delete the mine/subdir/ directory using this command:

rm -rf ~/mine/subdir/

Chapter 4 code results:

1) **$Nautilus**

```
bk08432@DESKTOP-BRH2KGB:~$ nautilus
** Message: 15:36:00.324: Connecting to org.freedesktop.Tracker3.Miner.Files
MESA: error: ZINK: failed to choose pdev
libEGL warning: egl: failed to create dri2 screen
MESA: error: ZINK: failed to choose pdev
glx: failed to create drisw screen

** (org.gnome.Nautilus:9619): WARNING **: 15:36:53.624: Unable to get contents of the bookmarks file: Error opening file
 /home/bk08432/.gtk-bookmarks: No such file or directory

** (org.gnome.Nautilus:9619): WARNING **: 15:36:53.624: Unable to get contents of the bookmarks file: Error opening file
 /home/bk08432/.gtk-bookmarks: No such file or directory
```

At first when I tried running the nautilus command, it didn't run because it wasn't installed on my laptop, I then ran sudo apt install nautilus, and then ran the nautilus command again and got the below output:

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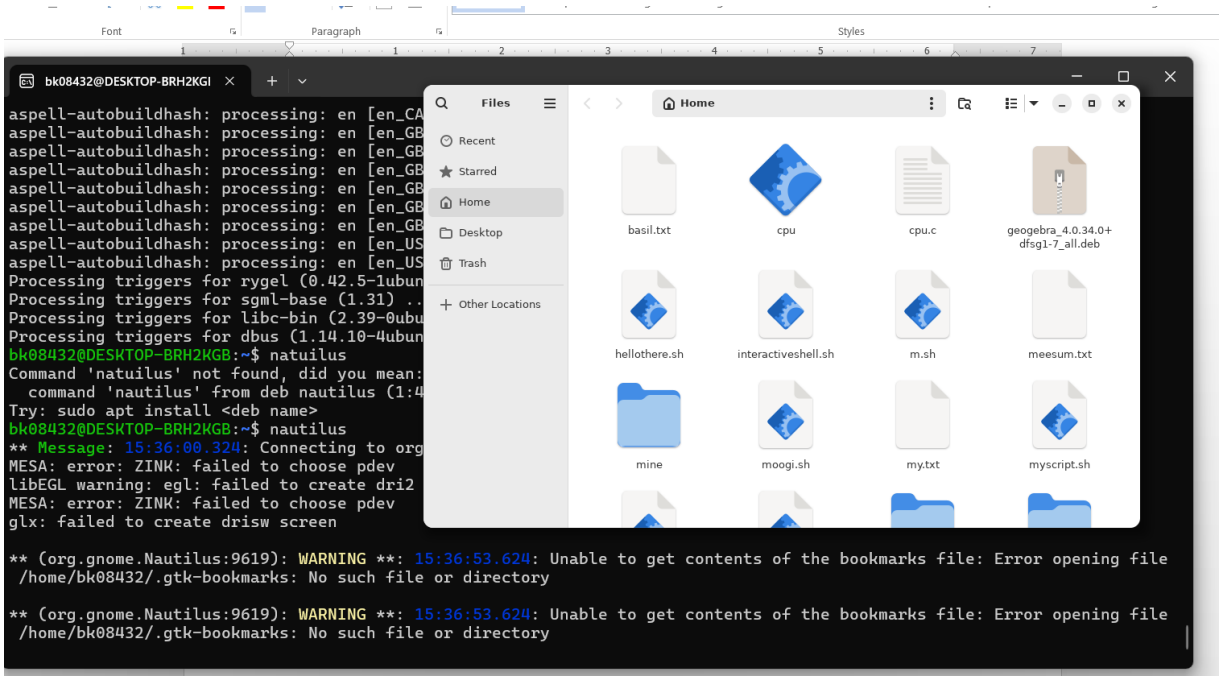
Section: T3

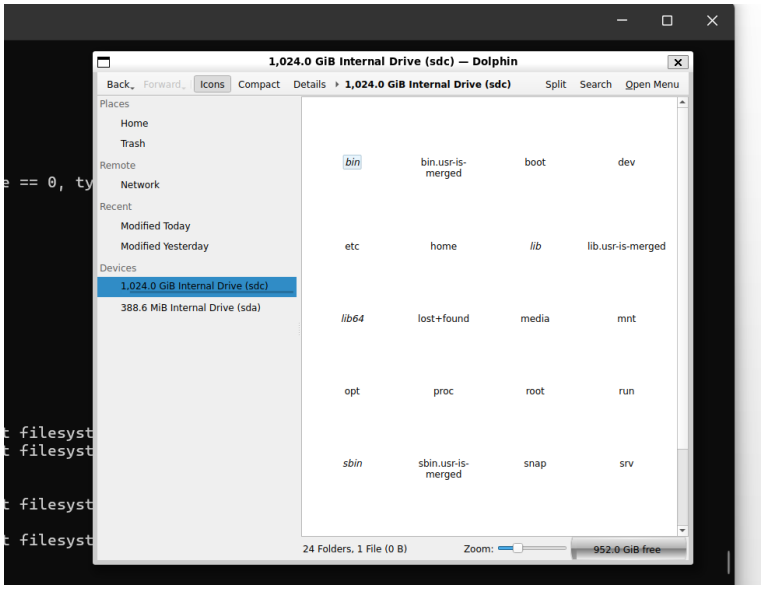


The GUI opened.

2) $dolphin

```
bk08432@DESKTOP-BRH2KGB:~$ dolphin
Command 'dolphin' not found, but can be installed with:
sudo snap install dolphin  # version 23.08.4, or
sudo apt  install dolphin  # version 4:23.08.4-0ubuntu1
See 'snap info dolphin' for additional versions.
bk08432@DESKTOP-BRH2KGB:~$ sudo apt install dolphin #version 23.08.4
```

When I installed the dolphin, this interface appeared.



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