



USER MANUAL

COMP 4981 Linux Terminal Simulator

Table of Contents

- 1 Intro to Linux Terminal Simulator2
- 2 Process Creation.....2
- 3 Program Flow | Functionality.....3














1 Intro to Linux Terminal Simulator

This application is a basic terminal process simulator for Linux to demonstrate the practical use of creating processes, communicating with pipes, and handling signals. To make the program interesting and interactive, we will be using user inputs to communicate between the processes and terminating them.

- typing 'E' will send the input to the other process to be interpreted
- typing 'T' will quit the program
- typing 'K' will remove all characters preceding it
- typing 'X' will remove the previous character
- all 'a' characters will be replaced with 'z' characters in the output

2 Process Creation

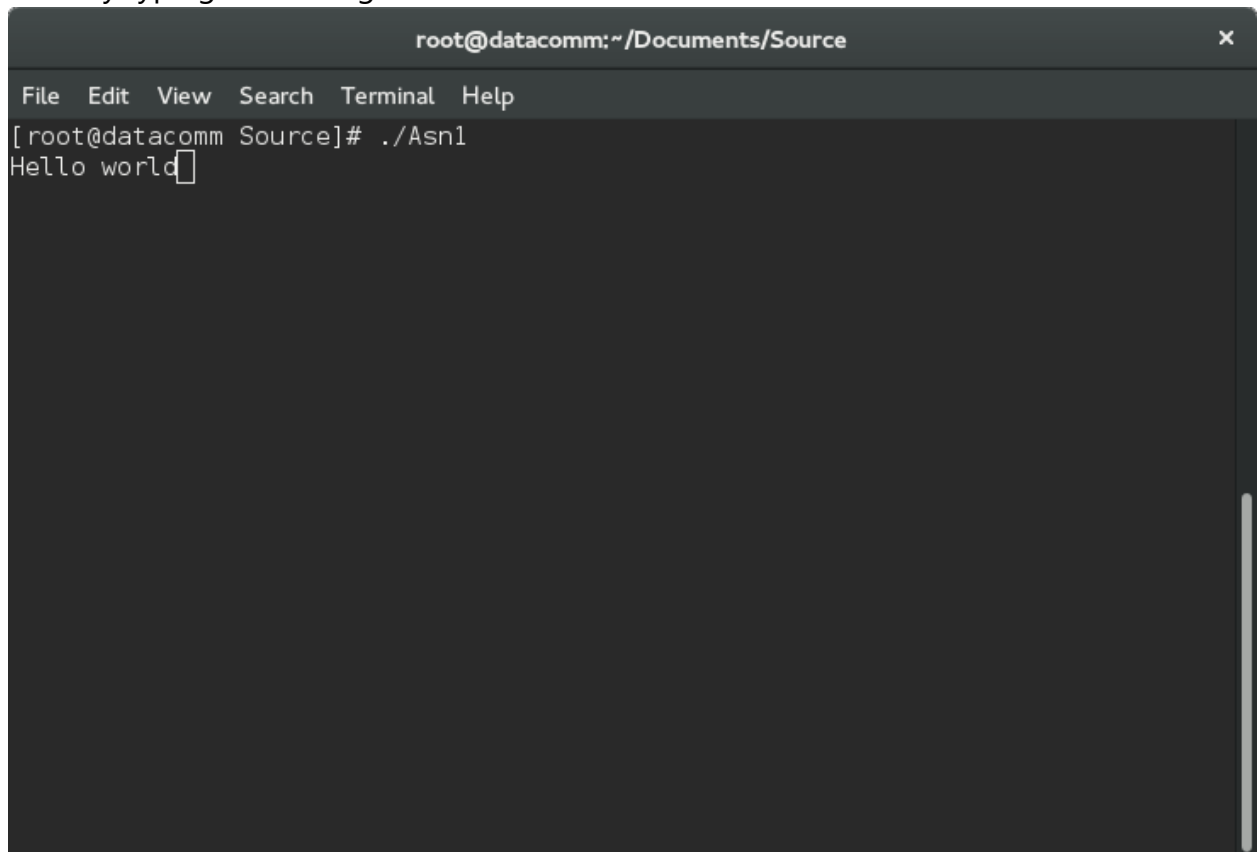
When the program is first launched, it will generate a default process to the application, which we will call it input. The input process will create a child process with the fork() API call, called the output process. After that it will create another child process, called the translate process.

Processes Resources File Systems							Q	≡	×
Process Name	User	% CPU	ID	Memory	Priority				
 abrt-applet	root	0	21931	4.4 MiB	Normal				
 abrt-d	root	0	795	1.3 MiB	Normal				
 abrt-dump-journal-oops	root	0	822	1.2 MiB	Normal				
 abrt-watch-log	root	0	824	960.0 KiB	Normal				
 accounts-daemon	root	0	756	880.0 KiB	Normal				
 acpi_thermal_pm	root	0	98	N/A	Very High				
 alsactl	root	0	746	240.0 KiB	Very Low				
 Asn1	root	0	25522	72.0 KiB	Normal				
 Asn1	root	0	25524	76.0 KiB	Normal				
 Asn1	root	0	25525	76.0 KiB	Normal				
 ata_sff	root	0	45	N/A	Very High				
 atd	root	0	829	184.0 KiB	Normal				
End Process									

3 Program Flow | Functionality

Now we have the processes ready to go, let's get into the flow of the program and its functionality.

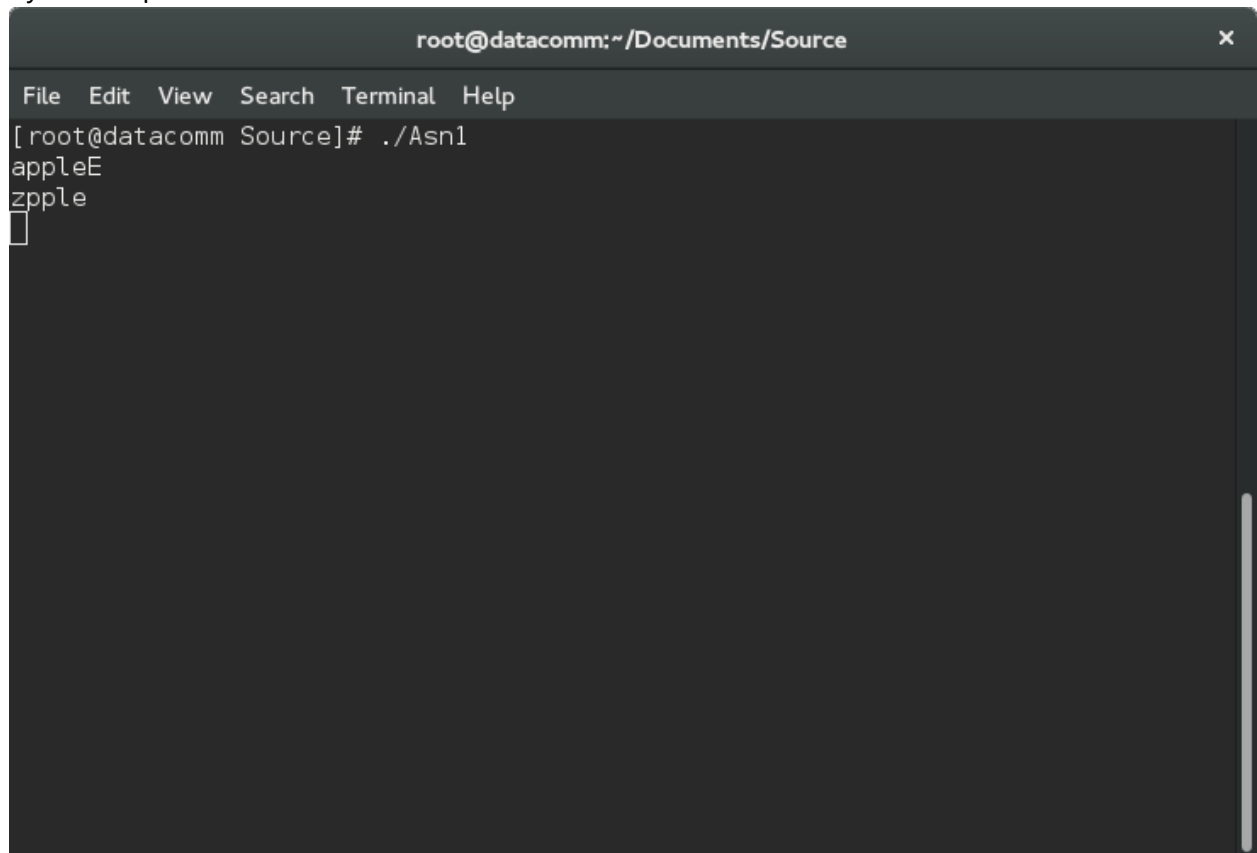
- First of all, all terminal signals will be disabled, which means that ^C, ^Z, enter, and any input echoing will be turned off
- Let's try typing something into the terminal

A screenshot of a terminal window with a dark background. The title bar at the top reads 'root@datacomm: ~/Documents/Source' and has a close button on the right. Below the title bar is a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal content shows a prompt '[root@datacomm Source]# ./Asn1' followed by the output 'Hello world' and a cursor. A vertical scrollbar is visible on the right side of the terminal area.

```
root@datacomm: ~/Documents/Source
File Edit View Search Terminal Help
[root@datacomm Source]# ./Asn1
Hello world
```

(*Note that the characters displayed is being echoed out by the output process)

- If we press 'E' after the input, it will be sent off to the translate process and echoed by the output after the translation

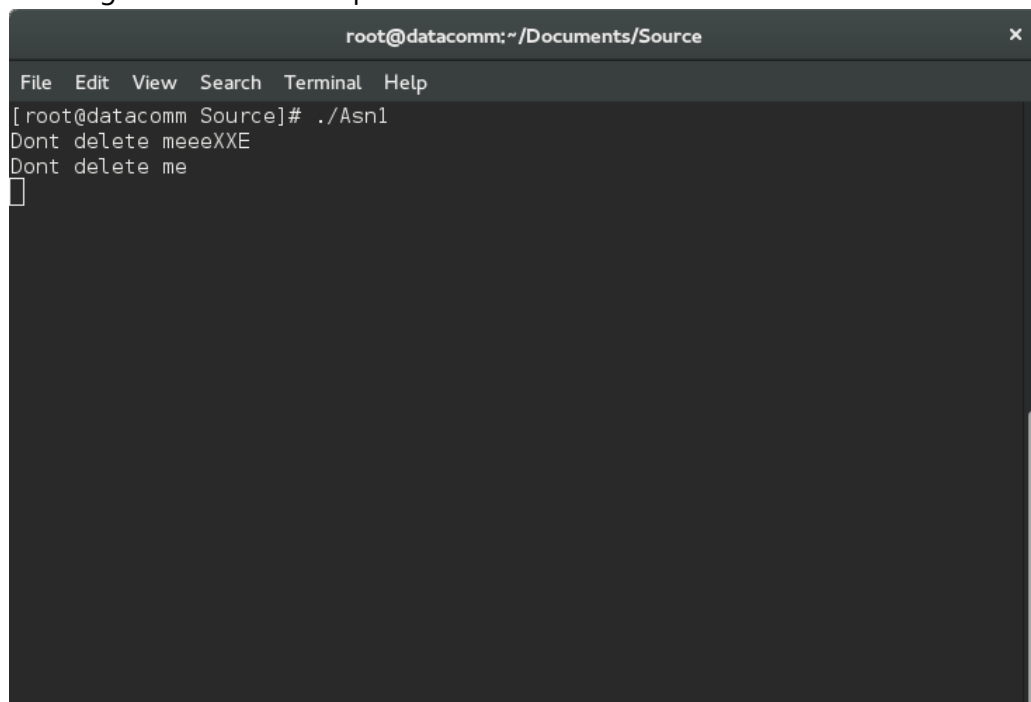


```
root@datacomm:~/Documents/Source
File Edit View Search Terminal Help
[root@datacomm Source]# ./Asn1
appleE
zpple
█
```

A terminal window titled 'root@datacomm:~/Documents/Source' with a menu bar (File, Edit, View, Search, Terminal, Help). The prompt is '[root@datacomm Source]# ./Asn1'. The user enters 'appleE' on the first line and 'zpple' on the second line. A cursor is visible at the end of the second line.

(* Note that the 'a' is translated to 'z')

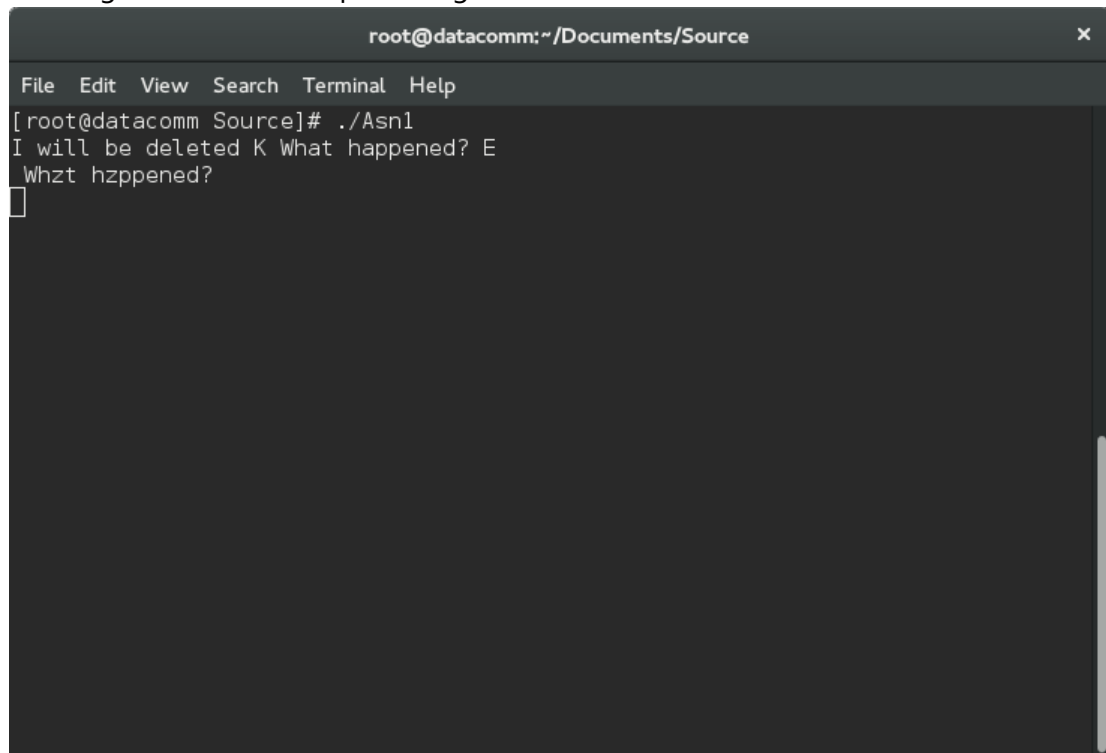
- Entering 'X' will delete the previous character



```
root@datacomm:~/Documents/Source
File Edit View Search Terminal Help
[root@datacomm Source]# ./Asn1
Dont delete meeeXXE
Dont delete me
█
```

A terminal window titled 'root@datacomm:~/Documents/Source' with a menu bar (File, Edit, View, Search, Terminal, Help). The prompt is '[root@datacomm Source]# ./Asn1'. The user enters 'Dont delete meeeXXE' on the first line and 'Dont delete me' on the second line. A cursor is visible at the end of the second line.

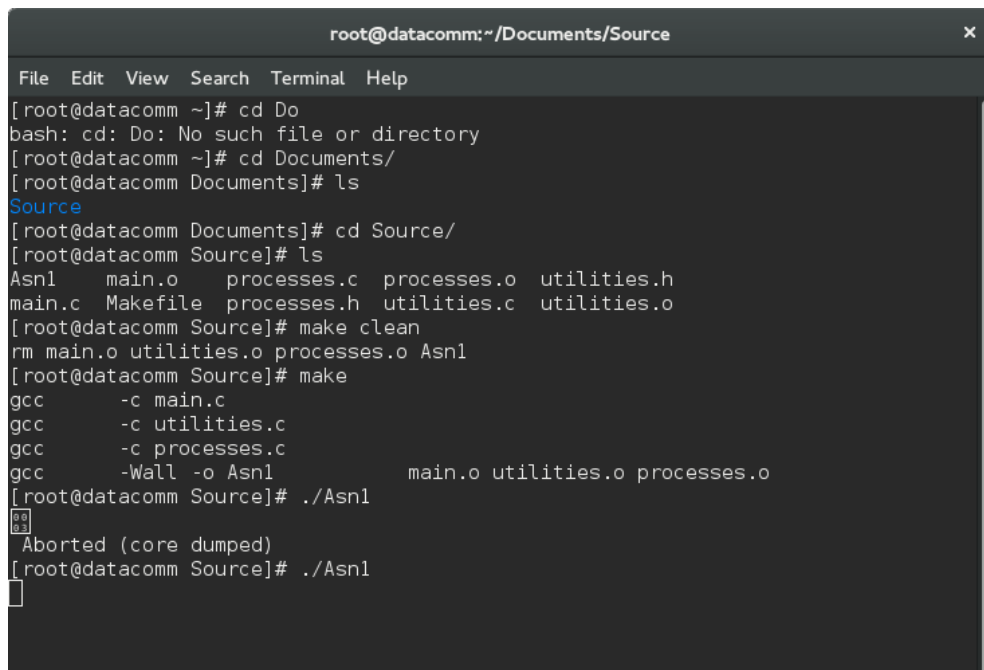
- Entering 'K' will delete all preceding characters



```
root@datacomm: ~/Documents/Source
File Edit View Search Terminal Help
[root@datacomm Source]# ./Asn1
I will be deleted K What happened? E
Whzt hzppened?
█
```

4 Terminating

Since all terminal processes are disabled, we assigned the key “^K” and “T” to terminate the program.



```
root@datacomm: ~/Documents/Source
File Edit View Search Terminal Help
[root@datacomm ~]# cd Do
bash: cd: Do: No such file or directory
[root@datacomm ~]# cd Documents/
[root@datacomm Documents]# ls
Source
[root@datacomm Documents]# cd Source/
[root@datacomm Source]# ls
Asn1  main.o  processes.c  processes.o  utilities.h
main.c  Makefile  processes.h  utilities.c  utilities.o
[root@datacomm Source]# make clean
rm main.o utilities.o processes.o Asn1
[root@datacomm Source]# make
gcc -c main.c
gcc -c utilities.c
gcc -c processes.c
gcc -Wall -o Asn1 main.o utilities.o processes.o
[root@datacomm Source]# ./Asn1
Aborted (core dumped)
[root@datacomm Source]# ./Asn1
█
```

