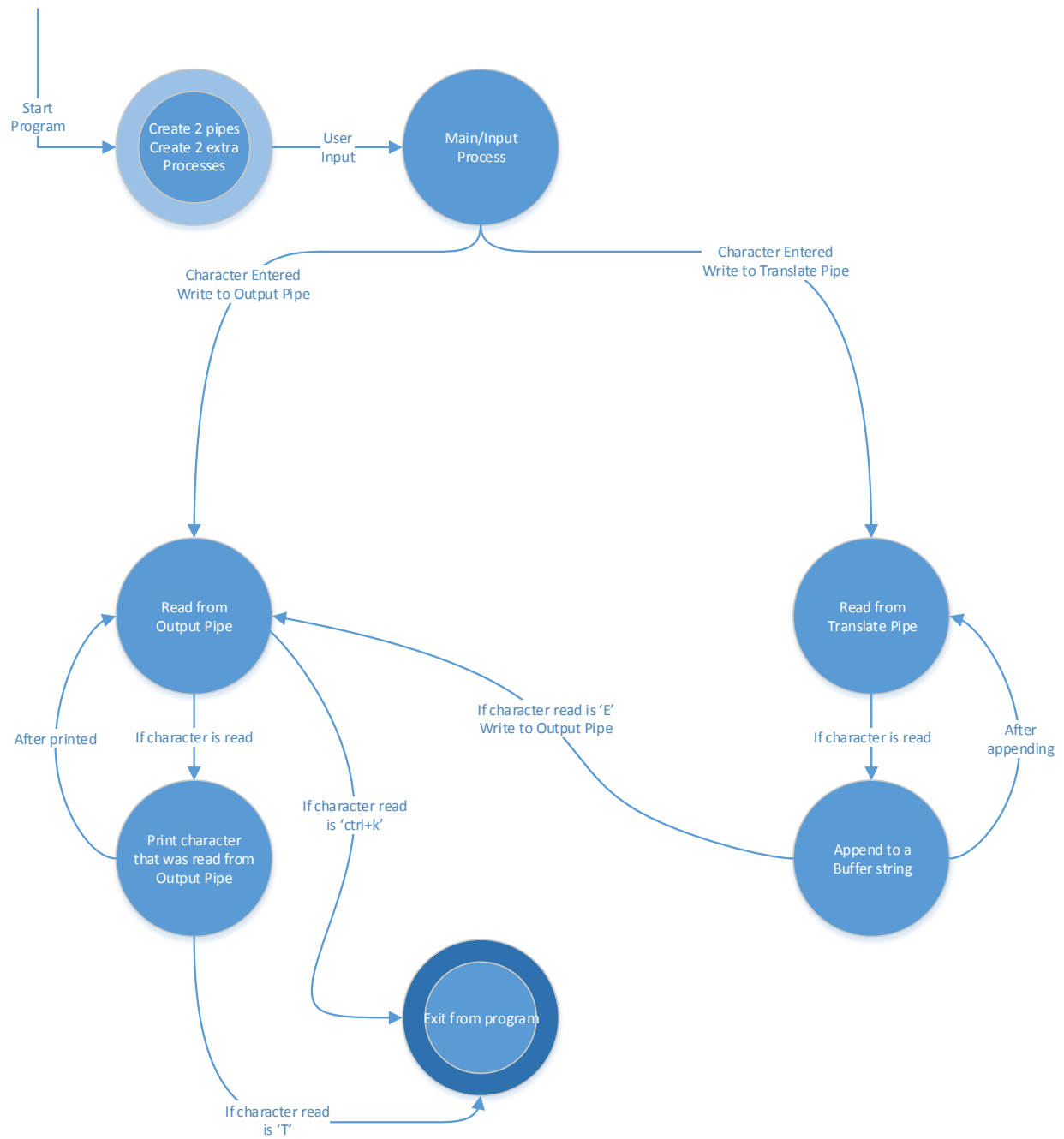




COMP 4981 ASSIGNMENT 1

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Design



Function Prototypes

```
Int main()
void catch_usr1 ()
void catch_int ()
void exit_program(pid_t translateProcess, pid_t outputProcess)
void translate_process(int translate_pipe, int c, int output_pipe, char* buffer)
void append(char* s, char c)
void backspace(char* s)
void print_translate(char* buffer, int pipe)
void output_process(int output_pipe, int c)
```

Pseudo Code

```
MainProcess()
{
    Turn off echo, turn on ignore character return and function inputs (raw)
    Create 2 pipes to use
    Create 2 processes

    If OutputProcess, call OutputProcess function
    If TranslateProcess, call TranslateProcess function
    If the ParentProcess/MainProcess
        while(1)
        {
            read in characters from keyboard (getchar)

            If the character read is Ctrl+k
            {
                kill all processes
            }

            write to output pipe
            write to translate pipe

            If the character read is 'T', then terminate (after writing to the pipes)
        }
}

OutputProcess()
{
    while(1)
    {
        read from pipe
        print character read from pipe
    }
}
```

```

TranslateProcess()
{
    while(1)
    {
        read from pipe
        if character is X
        {
            delete last character function
        }
        if character is E
        {
            write to the output process through the output pipe
        }
        if character is K
        {
            clear the buffer so nothing will be printed
        }
        else
        {
            append character function
        }
    }
    Continous loop to read from the pipe
    As characters come in,
}

```

```

append(char*, char)
{
    add character to the char array buffer
}

```

```

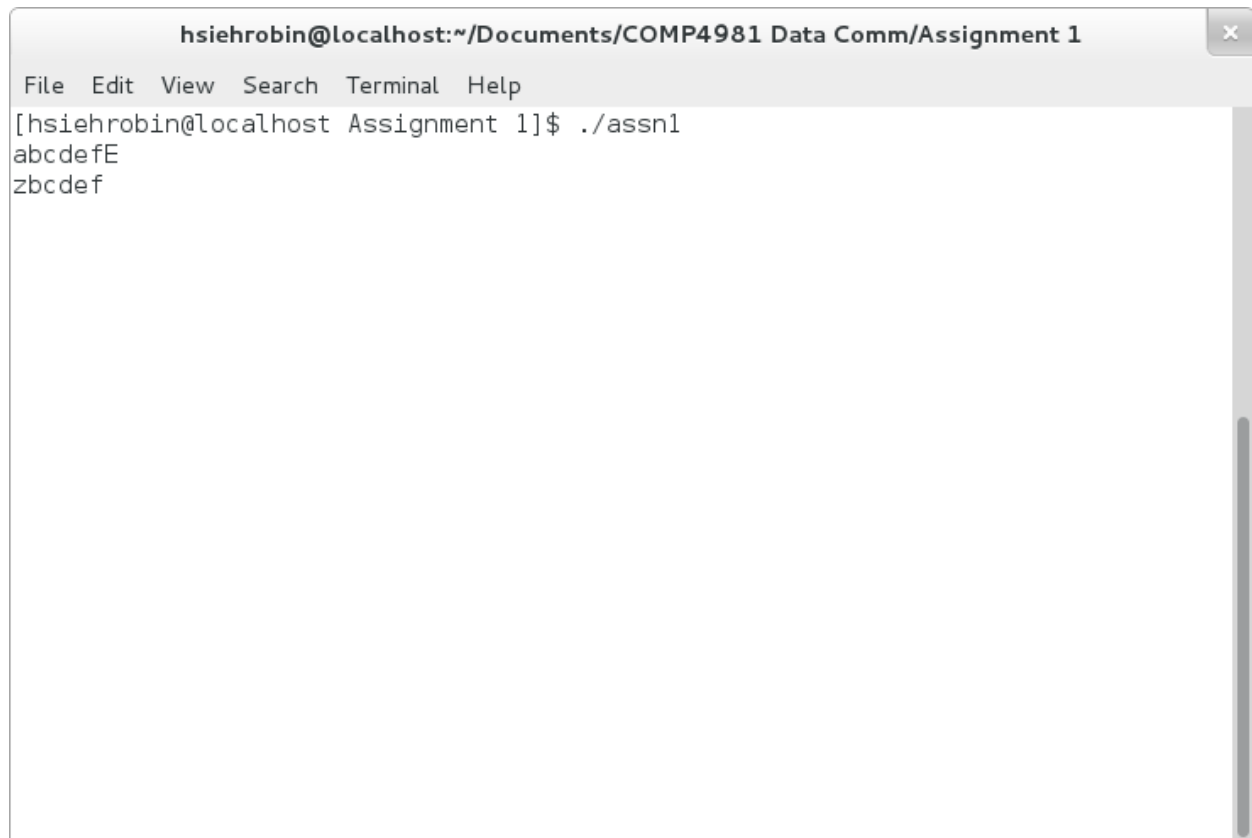
delete_last_character(char*)
{
    delete the last character in the char array buffer
}

```

Test Documents

Test	Test Description	Expected Result	Pass/Fail	Screen Shot
1	Test the 'E' to act as Enter	Print the string, as well as string after it has been translated	Pass	Figure 1
2	Test the 'X' to act as backspace	Print the string, as well as string after it has been deleted with the amount of X there are	Pass	Figure 2
3	Test the 'K' to act as line kill	Print the string, but kills the line (clearing the buffer)	Pass	Figure 3
4	Test the 'T' to terminate the program	Terminates the program after both output has been printed	Pass	Figure 4
5	Create 3 processes	3 processes displays in 'ps auxw'	Pass	Figure 5, 6
6	Control + K to terminate the program	Terminates the program immediately	Pass	Figure 7, 8
7	Running the program through all the different tests	Works with 'E', 'X', 'K', and 'T'	Pass	Figure 9

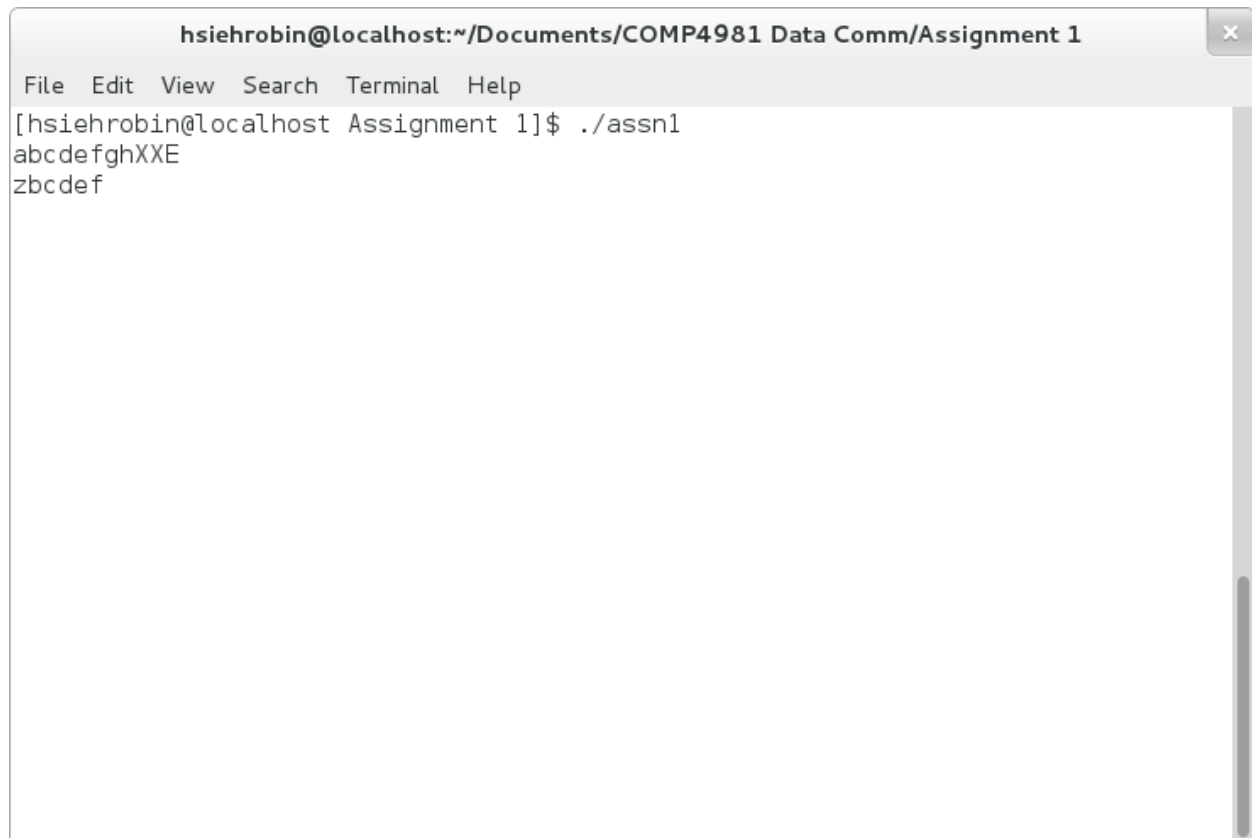
Figure 1



A terminal window titled "hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1" with a close button in the top right corner. The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content shows the command prompt "[hsiehrobin@localhost Assignment 1]\$./asn1" followed by two lines of output: "abcdefE" and "zbcdef".

```
hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1
File Edit View Search Terminal Help
[hsiehrobin@localhost Assignment 1]$ ./asn1
abcdefE
zbcdef
```

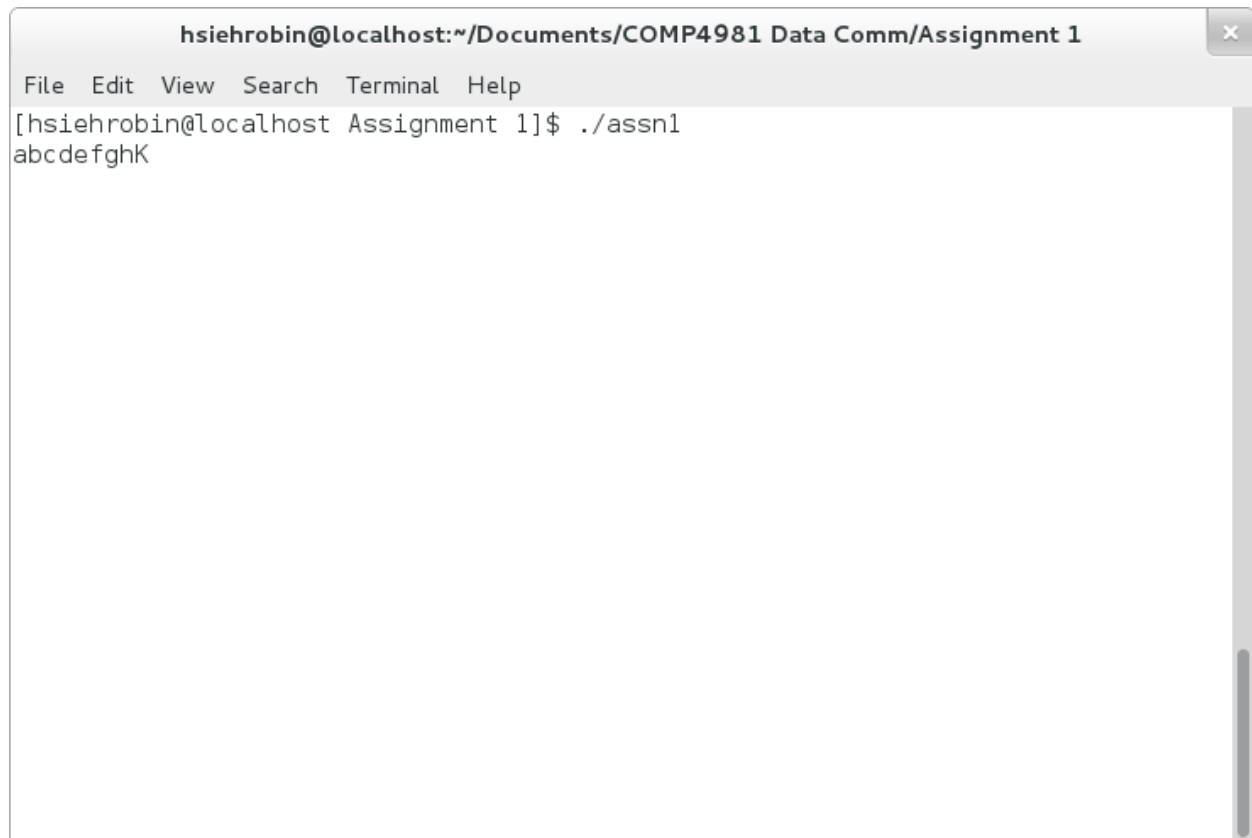
Figure 2



A terminal window titled "hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1" with a close button in the top right corner. The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content shows the command prompt "[hsiehrobin@localhost Assignment 1]\$./assn1" followed by two lines of output: "abcdefghXXE" and "zbcdef".

```
hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1
File Edit View Search Terminal Help
[hsiehrobin@localhost Assignment 1]$ ./assn1
abcdefghXXE
zbcdef
```

Figure 3



A terminal window titled "hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1" with a close button in the top right corner. The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content shows the command prompt "[hsiehrobin@localhost Assignment 1]\$./asn1" followed by the output "abcdefghK".

```
hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1
File Edit View Search Terminal Help
[hsiehrobin@localhost Assignment 1]$ ./asn1
abcdefghK
```


Figure 4



A terminal window titled "hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1" with a close button in the top right corner. The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content shows the command `./assn1` being executed, which produces the output `abcdefghijklT` and `zbcdefghj` on separate lines. The prompt `[hsiehrobin@localhost Assignment 1]$` is followed by a black cursor block.

```
hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1
File Edit View Search Terminal Help
[hsiehrobin@localhost Assignment 1]$ ./assn1
abcdefghijklT
zbcdefghj
[hsiehrobin@localhost Assignment 1]$ █
```

Figure 5

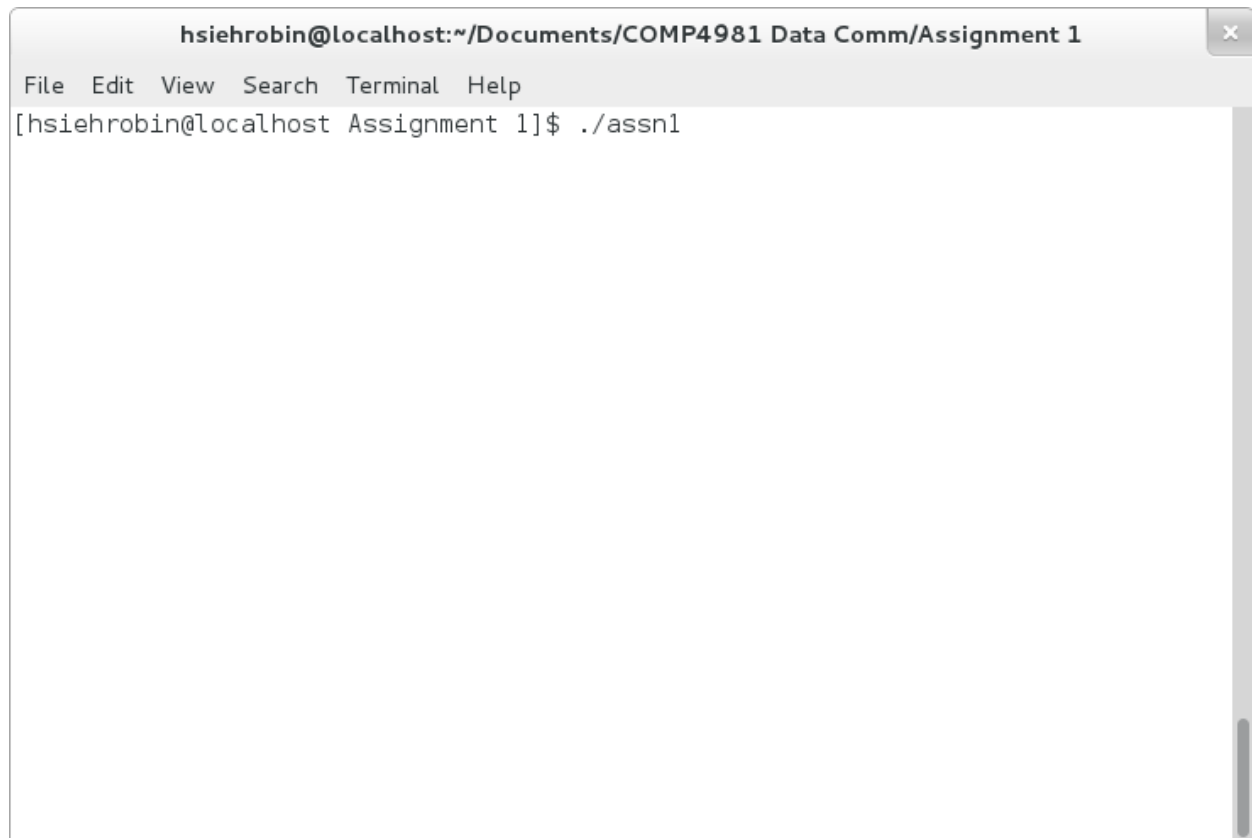


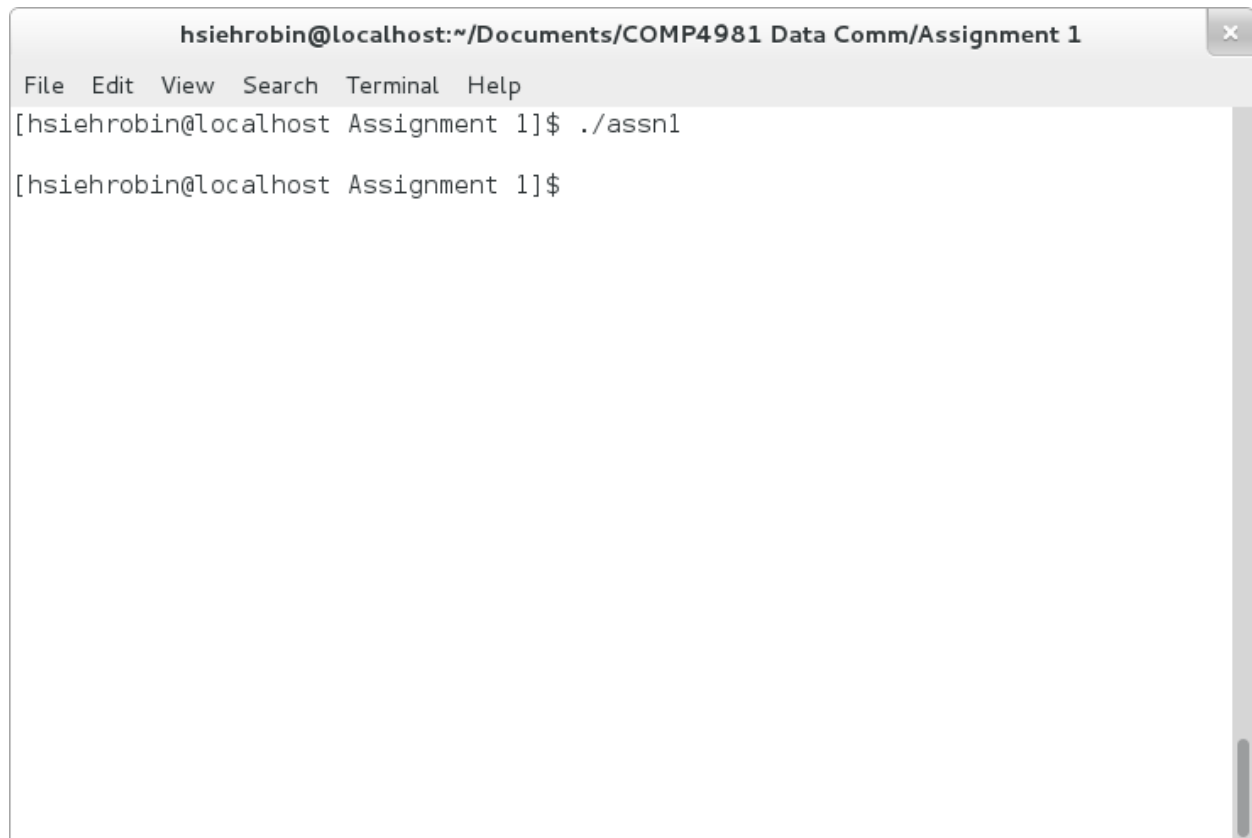
Figure 6

```

hsiehrobin@localhost:~
File Edit View Search Terminal Help
ome/chrome --type=renderer --lang=en-US --force-fiel
hsiehro+ 2120 1.2 0.7 1154204 119424 ? Sl 22:29 0:04 /opt/google/chr
ome/chrome --type=renderer --lang=en-US --force-fiel
hsiehro+ 2125 0.0 0.2 1070592 34592 ? Sl 22:29 0:00 /opt/google/chr
ome/chrome --type=renderer --lang=en-US --force-fiel
hsiehro+ 2170 0.6 0.3 1117044 64536 ? Sl 22:29 0:02 /opt/google/chr
ome/chrome --type=renderer --disable-databases --lan
hsiehro+ 2259 0.1 0.2 1081076 48064 ? Sl 22:31 0:00 /opt/google/chr
ome/chrome --type=renderer --disable-databases --lan
hsiehro+ 2336 0.5 0.1 636224 17572 ? Dl 22:31 0:01 /usr/libexec/gn
ome-terminal-server
hsiehro+ 2339 0.0 0.0 8460 736 ? S 22:31 0:00 gnome-pty-helpe
r
hsiehro+ 2340 0.0 0.0 116144 2848 pts/0 Ss 22:31 0:00 bash
hsiehro+ 2455 0.0 0.0 229956 4564 ? Sl 22:32 0:00 /usr/libexec/gv
fsd-metadata
root 2499 0.1 0.0 0 0 ? S 22:33 0:00 [kworker/u16:0]
root 2500 0.0 0.0 0 0 ? S 22:33 0:00 [kworker/3:1]
hsiehro+ 2592 0.0 0.0 116012 2632 pts/1 Ss 22:34 0:00 bash
hsiehro+ 2621 0.0 0.0 4168 324 pts/0 S+ 22:35 0:00 ./assn1
hsiehro+ 2623 0.0 0.0 4164 80 pts/0 S+ 22:35 0:00 ./assn1
hsiehro+ 2624 0.0 0.0 4164 80 pts/0 S+ 22:35 0:00 ./assn1
hsiehro+ 2628 0.0 0.0 114868 1224 pts/1 R+ 22:35 0:00 ps auxw
[hsiehrobin@localhost ~]$

```

Figure 7

A terminal window titled "hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1" with a close button in the top right corner. The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content shows the prompt "[hsiehrobin@localhost Assignment 1]\$./assn1" followed by a new line with the prompt "[hsiehrobin@localhost Assignment 1]\$".

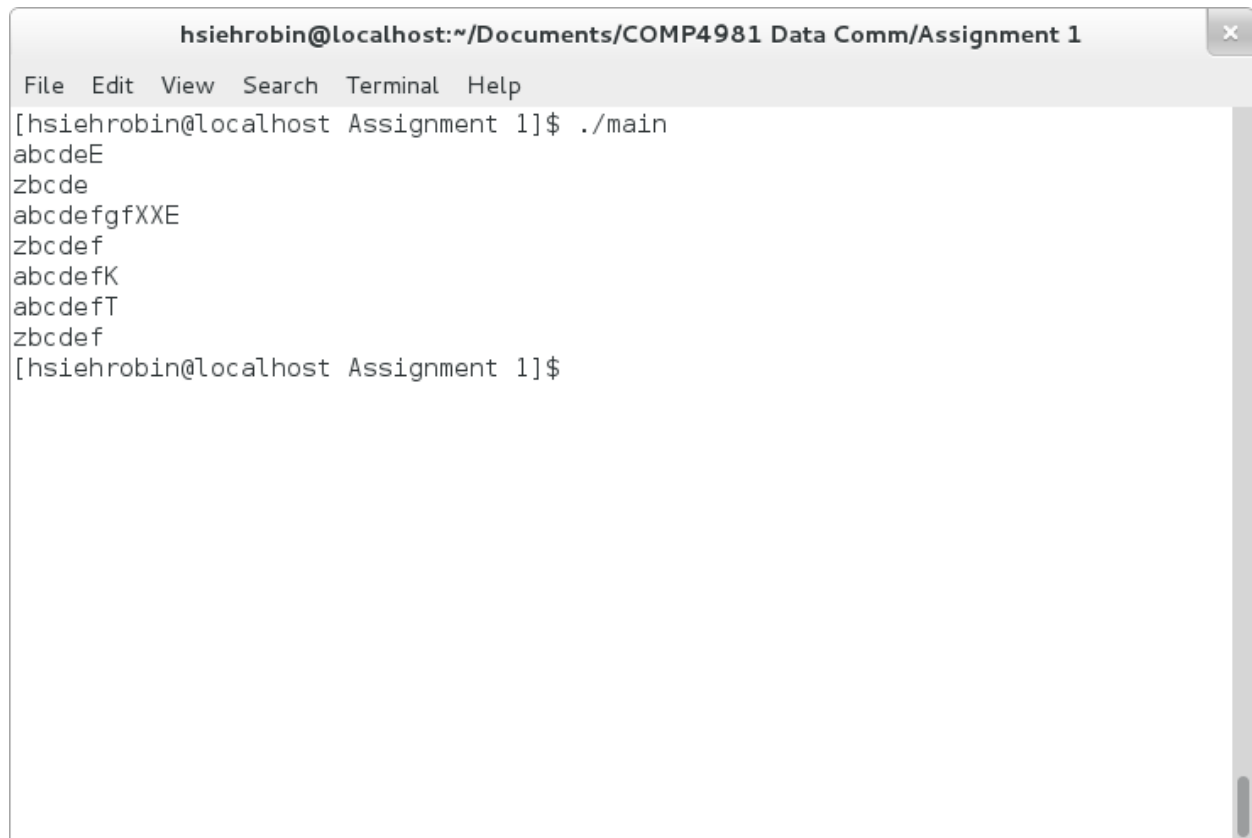
```
hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1
File Edit View Search Terminal Help
[hsiehrobin@localhost Assignment 1]$ ./assn1
[hsiehrobin@localhost Assignment 1]$
```

```

hsiehrobin@localhost:~
File Edit View Search Terminal Help
hsiehro+ 2115 0.0 0.2 1074688 36052 ? Sl 22:29 0:00 /opt/google/chr
ome/chrome --type=renderer --lang=en-US --force-fiel
hsiehro+ 2120 1.1 0.7 1154204 119424 ? Sl 22:29 0:04 /opt/google/chr
ome/chrome --type=renderer --lang=en-US --force-fiel
hsiehro+ 2125 0.0 0.2 1070592 34592 ? Sl 22:29 0:00 /opt/google/chr
ome/chrome --type=renderer --lang=en-US --force-fiel
hsiehro+ 2170 0.5 0.3 1117044 64536 ? Sl 22:29 0:02 /opt/google/chr
ome/chrome --type=renderer --disable-databases --lan
hsiehro+ 2259 0.1 0.2 1081076 48068 ? Sl 22:31 0:00 /opt/google/chr
ome/chrome --type=renderer --disable-databases --lan
hsiehro+ 2336 0.5 0.1 636224 17572 ? Sl 22:31 0:01 /usr/libexec/gn
ome-terminal-server
hsiehro+ 2339 0.0 0.0 8460 736 ? S 22:31 0:00 gnome-pty-helpe
r
hsiehro+ 2340 0.0 0.0 116144 2848 pts/0 Ss+ 22:31 0:00 bash
hsiehro+ 2455 0.0 0.0 229956 4564 ? Sl 22:32 0:00 /usr/libexec/gv
fsd-metadata
root 2499 0.0 0.0 0 0 ? S 22:33 0:00 [kworker/u16:0]
root 2500 0.0 0.0 0 0 ? S 22:33 0:00 [kworker/3:1]
hsiehro+ 2592 0.0 0.0 116012 2636 pts/1 Ss 22:34 0:00 bash
hsiehro+ 2639 0.1 0.0 546672 9508 ? SNL 22:35 0:00 /usr/libexec/tr
acker-extract
hsiehro+ 2677 0.0 0.0 114868 1224 pts/1 R+ 22:36 0:00 ps auxw
[hsiehrobin@localhost ~]$

```

Figure 9

A terminal window titled "hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1" with a standard menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the execution of a program named "main" which outputs several lines of text. The prompt is "[hsiehrobin@localhost Assignment 1]\$".

```
hsiehrobin@localhost:~/Documents/COMP4981 Data Comm/Assignment 1
File Edit View Search Terminal Help
[hsiehrobin@localhost Assignment 1]$ ./main
abcdeE
zbcde
abcdefgfXXE
zbcdef
abcdefK
abcdefT
zbcdef
[hsiehrobin@localhost Assignment 1]$
```