20. At the command prompt, type **asample** and press Enter. What happened and why? What environment file could you add this alias to so that it is executed each time a new BASH shell is created?
21. Type **exit** and press Enter to log out of your shell.

Project 7-4

In this hands-on project, you create a basic shell script and execute it on the system.

1. Switch to a command-line terminal (tty2) by pressing Ctrl+Alt+F2 and log in to the terminal using the user name of root and the password of secret.
2. At the command prompt, type **vi myscript** and press Enter to open a new file for editing called myscript in your home directory.
3. Enter the following text into the myscript2 file. When finished, save and quit the vi editor.

```
#!/bin/bash
echo -e "This is a sample shell script. \t It displays mounted
 filesystems \a"
mount
```

4. At the command prompt, type **ls -l myscript** and press Enter. What permissions does the myscript file have? Next, type **bash myscript** at the command prompt and press Enter. Did the shell script execute? What do the \t and \a escape sequences do?
5. Next, type **./myscript** at the command prompt and press Enter. What error message did you receive and why?
6. At the command prompt, type **chmod u+x myscript** and press Enter. Next, type **./myscript** at the command prompt and press Enter. Did the script execute? Why?
7. Type **exit** and press Enter to log out of your shell.

Project 7-5

In this hands-on project, you create a shell script that uses decision and loop constructs to analyze user input.

1. Switch to a command-line terminal (tty2) by pressing Ctrl+Alt+F2 and log in to the terminal using the user name of root and the password of secret.
2. At the command prompt, type **vi myscript2** and press Enter to open a new file for editing called myscript2 in your home directory.
3. Enter the following text into the myscript2 file. When finished, save and quit the vi editor.

```
#!/bin/bash
echo -e "This program adds entries to a family database file.\n"
echo -e "Please enter the name of the family member --> \c"
read NAME
echo -e "Please enter the family member's relation to you
(e.g., mother) --> \c"
```

```
read RELATION
echo -e "Please enter the family member's telephone number --> \c"
read PHONE
echo -e "$NAME\t$RELATION\t$PHONE" >> database
```

4. At the command prompt, type **chmod u+x myscript2** and press Enter. Next, type **./myscript2** at the command prompt and press Enter. Answer the questions with information regarding one of your family members.
5. At the command prompt, type **cat database** and press Enter. Was the entry from Step 4 present? Why?
6. Re-execute the myscript2 script (from Step 4) several times to populate the database file with entries.
7. At the command prompt, type **vi myscript2** and press Enter. Edit the text inside the myscript2 shell script so that it reads:

```
#!/bin/bash
echo -e "Would you like to add an entry to the family database file?\n"
read ANSWER1
if [ $ANSWER1 = "y" -o $ANSWER1 = "Y" ]
then
echo -e "Please enter the name of the family member --> \c"
read NAME
echo -e "Please enter the family member's relation to you (i.e. mother)
  --> \c"
read RELATION
echo -e "Please enter the family member's telephone number --> \c"
read PHONE
echo -e "$NAME\t$RELATION\t$PHONE" >> database
fi
echo -e "Would you like to search an entry in the family database
  file?\n"
read ANSWER2
if [ $ANSWER2 = "y" -o $ANSWER2 = "Y" ]
then
echo -e "What word would you like to look for? --> \c"
read WORD
grep "$WORD" database
fi
```

8. At the command prompt, type **./myscript2** and press Enter. When prompted to enter an entry into the database, choose **y** and press Enter. Answer the questions with information regarding one of your family members. Next, when prompted to search the database, answer **y** and press Enter. Search for the name that you just entered a few seconds ago. Is it there?
9. At the command prompt, type **./myscript2** and press Enter. When prompted to enter an entry into the database, choose **n** and press Enter. Next, when prompted to search the database, answer **y** and press Enter. Search for a name that you entered in Step 6. Was it there? Why?

10. At the command prompt, type **vi myscript2** and press Enter. Edit the text inside the myscript2 shell script so that it reads:

```
#!/bin/bash
echo -e "What would you like to do?
Add an entry (a)
Search an entry (s)
Enter your choice (a/s)-->\c"
read ANSWER
case $ANSWER in
a|A ) echo -e "Please enter the name of the family member --> \c"
    read NAME
    echo -e "Please enter the family member's relation to you
(i.e. mother)-->\c"
    read RELATION
    echo -e "Please enter the family member's telephone number --> \c"
    read PHONE
    echo -e "$NAME\t$RELATION\t$PHONE" >> database
    ;;
s|S ) echo -e "What word would you like to look for? --> \c"
    read WORD
    grep "$WORD" database
    ;;
 *) echo "You must enter either the letter a or s."
    ;;
esac
```

11. At the command prompt, type **./myscript2** and press Enter. Choose **y** and press Enter. What error message do you receive and why?
12. At the command prompt, type **./myscript2** and press Enter. Choose **a** and press Enter. Enter information about another family member. Does it matter whether you entered a or A at the prompt earlier? Why?
13. At the command prompt, type **./myscript2** and press Enter. Choose **s** and press Enter. Search for the family member entered in Step 12. Does it matter whether you entered s or S at the prompt earlier? Why?
14. At the command prompt, type **vi myscript2** and press Enter. Edit the text inside the myscript2 shell script so that it reads:

```
#!/bin/bash
while true
do
clear
echo -e "What would you like to do?
Add an entry (a)
Search an entry (s)
Quit (q)
Enter your choice (a/s/q)-->\c"
read ANSWER
```

```
case $ANSWER in
a|A ) echo -e "Please enter the name of the family member --> \c"
    read NAME
    echo -e "Please enter the family member's relation to you
(i.e. mother)-->\c"
    read RELATION
    echo -e "Please enter the family member's telephone number --> \c"
    read PHONE
    echo-e "$NAME\t$RELATION\t$PHONE" >> database
    ;;
s|S ) echo-e "What word would you like to look for? --> \c"
    read WORD
    grep "$WORD" database
    sleep 4
    ;;
q|Q ) exit
    ;;
*)    echo "You must enter either the letter a or s."
    sleep 4
    ;;
esac
done
```

15. At the command prompt, type **./myscript2** and press Enter. Choose **a** and press Enter. Enter information about another family member. Does the menu appear again after you were finished? Why? Choose **s** and press Enter. Search for the family member that you just entered. Choose **q** to quit the shell script.
16. At the command prompt, type **vi myscript3** and press Enter to edit a new file called myscript3 in your home directory.
17. Enter the following text into the myscript3 file. When finished, save and quit the vi editor.

```
#!/bin/bash
echo -e "This program copies a file to the /stuff directory.\n"
echo -e "Which file would you like to copy? --> \c"
read FILENAME
mkdir /stuff || echo "The /stuff directory could not be created."
cp -f $FILENAME /stuff && echo "$FILENAME was successfully copied to
  /stuff"
```

18. At the command prompt, type **chmod u+x myscript3** and press Enter. Next, type **./myscript3** at the command prompt and press Enter. When prompted for a filename, type **/etc/hosts** and press Enter. Was the /stuff directory created successfully? Why or why not? Was the /etc/hosts file copied successfully to the /stuff directory? Why or why not?
19. Type **./myscript3** at the command prompt and press Enter. When prompted for a filename, type **/etc/inittab** and press Enter. Was the /stuff directory created successfully? Why or why not? Was the /etc/inittab file copied successfully to the /stuff directory? Why or why not?

20. At the command prompt, type **vi myscript4** and press Enter to edit a new file called myscript4 in your home directory.
21. Enter the following text into the myscript4 file. When finished, save and quit the vi editor.

```
#!/bin/bash
echo "These are the scripts that you have created previously:"
ls -l myscript myscript2 myscript3
sleep 2
echo "This script will now change the permissions on each script
such that the root user has exclusive rights only."
sleep 3
for FILE in myscript myscript2 myscript3
do
chmod 700 $FILE
done

echo "The new permissions are listed below:"
ls -l myscript myscript2 myscript3
```

22. At the command prompt, type **chmod u+x myscript4** and press Enter. Next, type **./myscript4** at the command prompt and press Enter. Were the permissions changed to rwx------ for myscript, myscript2, and myscript3?
23. Type **exit** and press Enter to log out of your shell.

Discovery Exercises

1. Name the command that can be used to:
   a. Create an alias called mm that displays only those filesystems that are mounted and contain an ext2 filesystem.
   b. Create and export a variable called NEWHOME that is equivalent to the value contained in the HOME variable.
   c. Find all files that start with the word "host" starting from the /etc directory and save the stdout to a file called file1 and the stderr to the same file.
   d. Display only the lines from the output of the `set` command that have the word "bash" in them. This output on the terminal screen should be sorted alphabetically.
   e. Display only the user name (first field) in the colon-delimited /etc/password file and save the output to a file called users in the current directory.
2. What would happen if the user executed the following command?

   ```
   tr a A </etc/hosts | sort -r | pr -d >/etc/hosts
   ```

   Explain the output.
3. Recall that only stdout can be sent across a pipe to another command. Using the information presented in this chapter, how could you send stderr across the pipe in the following command?

   ```
   ls /etc/hosts /etc/h | tr h H
   ```