

## Test Case #1

### Sample Input File

testcase1.txt
<pre>net user admin ya84*_o net group Administrators net group Administrators admin net group Users login admin ya84*_o net user alice Wvu_4_Life net user bob SHHHsecret net group Students net group Students alice net group Students bob net user tom geek_247 logout login alice Wvu_4_Life create file1.txt write file1.txt Text from Alice in file1 create file2.txt write file2.txt Text from Alice in file2 xcaccls file2.txt /E /G Users:R xcaccls file2.txt /E /G Students:RW logout login tom geek_247 read file1.txt read file2.txt write file2.txt Text from Tom in file2 login bob SHHsecret logout login bob SHHsecret login bob SHHHsecret write file2.txt Text from Bob in file2 read file2.txt logout login tom geek_247 xcaccls file1.txt /D alice logout end</pre>

### ***Line-by-Line Expected Program Execution***

Note: The lines marked with \* should appear only if the extra credit functionality has been implemented.

```
>
net user admin ya84*_o
```

Creates privileged user `admin` by adding entry to *accounts.txt* file containing username and plaintext password and UAC setting (for the extra credit question)

Display message to terminal: "User admin created",  
\*Display message to terminal: "Notify only on change"

Log message to *audit.txt* file: "User admin created"  
\*Log message to *audit.txt* file: "Notify only on change"

```
>
net group Administrators
```

Creates group `Administrators` without any users.

Display message to terminal: "Group Administrators created"

Log message to *audit.txt* file: "Group Administrators created"

```
>
net group Administrators admin
```

Adds user `admin` to group `Administrators`

Display message to terminal: "User admin added to group Administrators"

Log message to *audit.txt* file: "User admin added to group Administrators"

```
>
net group Users
```

Creates group `Users` without any users.

Display message to terminal: "Group Users created"

Log message to *audit.txt* file: "Group Users created"

```
>  
login admin ya84*_o
```

Locates entry for user `admin` in *accounts.txt* file and verifies that supplied password (or hash of supplied password) matches the one in the file

Successfully logs user `admin` into system

Display message to terminal: "User admin logged in"

Log message to *audit.txt* file: "User admin logged in"

```
>  
net user alice Wvu_4_Life
```

Creates user `alice` by adding entry to *accounts.txt* file containing username and plaintext password and UAC setting (for the extra credit question). Adds the user `alice` to group `Users`.

Display message to terminal: "User alice created"

\*Display message to terminal: "Notify only on change"

Log message to *audit.txt* file: "User alice created"

\*Log message to *audit.txt* file: "Notify only on change"

```
>  
net user bob SHHHsecret
```

Creates user `bob` by adding entry to *accounts.txt* file containing username and plaintext (or hashed) password and UAC setting (for the extra credit question). Adds the user `bob` to group `Users`.

Display message to terminal: "User bob created"

\*Display message to terminal: "Notify only on change"

Log message to *audit.txt* file: "User bob created"

\*Log message to *audit.txt* file: "Notify only on change"

```
>  
net group Students
```

Creates group `Students` without any users

Display message to terminal: "Group Students created"

Log message to *audit.txt* file: "Group Students created"

```
>
net group Students alice

Adds user alice to group Students

Display message to terminal: "User alice added to group Students"

Log message to audit.txt file: "User alice added to group Students"
```

```
>
net group Students bob

Adds user bob to group Students

Display message to terminal: "User bob added to group Students"

Log message to audit.txt file: "User bob added to group Students"
```

```
>
net user tom geek_247

Creates user tom by adding entry to accounts.txt file containing username and plaintext (or hashed)
password UAC setting (for the extra credit question). Adds the user tom to group Users.

Display message to terminal: "User tom created"
*Display message to terminal: "Notify only on change"

Log message to audit.txt file: "User tom created"
*Log message to audit.txt file: "Notify only on change"
```

```
>
logout

Logs out user admin

Display message to terminal: "User admin logged out"

Log message to audit.txt file: "User admin logged out"
```

```
>
login alice Wvu_4_Life
```

Locates entry for user *alice* in *accounts.txt* file and verifies that supplied password (or hash of the supplied password) matches the one in the file

Successfully logs user *alice* into system

Display message to terminal: "User *alice* logged in"

Log message to *audit.txt* file: "User *alice* logged in"

```
>
create file1.txt
```

Creates empty file named *file1.txt* with default permissions and *alice* as the owner

Display message to terminal: "File *file1.txt* with owner *alice* and default permissions created"

Log message to *audit.txt* file: "File *file1.txt* with owner *alice* and default permissions created "

```
>
write file1.txt Text from Alice in file1
```

Appends supplied text as new line to *file1.txt*

Display message to terminal: "User *alice* wrote to *file1.txt*: Text from Alice in *file1*"

Log message to *audit.txt* file: "User *alice* wrote to *file1.txt*: Text from Alice in *file1*"

```
>
create file2.txt
```

Creates empty file named *file2.txt* with default permissions and *alice* as the owner

Display message to terminal: "File *file2.txt* with owner *alice* and default permissions created "

Log message to *audit.txt* file: "File *file2.txt* with owner *alice* and default permissions created"

```
>  
write file2.txt Text from Alice in file2
```

Appends supplied text as new line to *file2.txt*

Display message to terminal: "User alice wrote to file2.txt: Text from Alice in file2"

Log message to *audit.txt* file: "User alice wrote to file2.txt: Text from Alice in file2"

```
>  
xcaccls file1.txt /E /G Users:R
```

Sets file permissions for *file1.txt* to allow read read for the Users group.

Display message to terminal: "The ACL for file1.txt appended by alice to include users:R"

Log message to *audit.txt* file: "The ACL for file1.txt appended by alice to include users:R"

```
>  
xcals file2.txt /E /G Students:RW
```

Sets Students group permissions for *file2.txt* to RW

Display message to terminal: "The ACL for file2.txt appended by alice to include Students:RW"

Log message to *audit.txt* file: "The ACL for file2.txt appended by alice to include Students:RW"

```
>  
logout
```

Logs out user alice

Display message to terminal: "User alice logged out"

Log message to *audit.txt* file: "User alice logged out"

```
>  
login tom geek_247
```

Locates entry for user `tom` in *accounts.txt* file and verifies that supplied password (or hash of supplied password) matches the one in the file.

Successfully logs user `tom` into system

Display message to terminal: "User tom logged in"

Log message to *audit.txt* file: "User tom logged in"

```
>  
read file1.txt
```

Display message to terminal: "User tom denied read access to file1.txt"

Log message to *audit.txt* file: "User tom denied read access to file1.txt"

```
>  
read file2.txt
```

Display the content of the file1.txt to terminal: "User tom reads file2.txt as: Text from Alice in file2"

Log message to *audit.txt* file: "User tom reads file2.txt as: Text from Alice in file2"

```
>  
write file2.txt Text from Tom in file2
```

Display message to terminal: "User tom denied write access to file2.txt"

Log message to *audit.txt* file: "User tom denied write access to file2.txt"

```
>  
login bob SHHsecret
```

Display message to terminal: "Login failed: simultaneous login not permitted"

Log message to *audit.txt* file: "Login failed: simultaneous login not permitted"

```
>  
logout
```

Logs out user tom

Display message to terminal: "User tom logged out"

Log message to *audit.txt* file: "User tom logged out"

```
>  
login bob SHHsecret
```

Display message to terminal: "Login failed: invalid username or password"

Log message to *audit.txt* file: " Login failed: invalid username or password"

```
>  
login bob SHHHsecret
```

Locates entry for user bob in *accounts.txt* file and verifies that supplied password (or hash of supplied password) matches the one in the file

Successfully logs user bob into system

Display message to terminal: "User bob logged in"

Log message to *audit.txt* file: "User bob logged in"

```
>  
write file2.txt Text from Bob in file2
```

Appends supplied text as new line to *file2.txt*

Display message to terminal: "User bob wrote to file2.txt: Text from Bob in file2"

Log message to *audit.txt* file: "User bob wrote to file2.txt: Text from Bob in file2"



```
>  
read file2.txt
```

User bob successfully reads *file2.txt*

Display message to terminal: "User bob reads file2.txt as: Text from Alice in file2 Text from Bob in file2"

Log message to *audit.txt* file: "User bob reads file2.txt as: Text from Alice in file2 Text from Bob in file2"

```
>  
logout
```

Logs out user bob

Display message to terminal: "User bob logged out"

Log message to *audit.txt* file: "User bob logged out"

```
>  
login tom geek_247
```

Locates entry for user tom in *accounts.txt* file and verifies that supplied password (or hash of supplied password) matches the one in the file

Successfully logs user tom into system

Display message to terminal: "User tom logged in"

Log message to *audit.txt* file: "User tom logged in"

```
>  
xcacls file1.txt /D alice
```

Overwrites ACL for file1.txt to include only D:alice (deny access to alice)

Display message to terminal: "Error with xcaccls: only file owner or member of Administrators group may run command"

Log message to *audit.txt* file: "Error with xcaccls: only file owner or member of Administrators group may run command"

```
>  
logout
```

Logs out user tom

Display message to terminal: "User tom logged out"

Log message to *audit.txt* file: "User tom logged out"

```
>  
end
```

Program writes out the *groups.txt* and *files.txt* files, performs necessary clean-up, and terminates

### ***Final Content of User Created Files***

file1.txt
Text from Alice in file1

file2.txt
Text from Alice in file2 Text from Bob in file2

### ***groups.txt Content***

groups.txt
Administrators: admin Users: alice bob tom Students: alice bob

### ***files.txt Content***

files.txt
file1.txt alice (alice:F,Administrators:F) file2.txt alice (alice:F,Administrators:F,Users:R,Students:RW)

### ***accounts.txt Content (An example format with plain ASCII passwords)***

accounts.txt
admin ya84*_o      Notify only on change alice Wvu_4_Life    Notify only on change bob SHHHsecret      Notify only on change tom geek_247        Notify only on change

The third column should appear only if the extra credit functionality has been implemented.

## Audit Log Content

audit.txt

```
User admin created
Notify only on change
Group Administrators created
User admin added to group Administrators
Group Users created
User admin logged in
User alice created
Notify only on change
User bob created
Notify only on change
Group Students created
User alice added to group Students
User bob added to group Students
User tom created
Notify only on change
User admin logged out
User alice logged in
File file1.txt with owner alice and default permissions created
User alice wrote to file1.txt: Text from Alice in file1
File file2.txt with owner alice and default permissions created
User alice wrote to file2.txt: Text from Alice in file2
The ACL for file2.txt appended by alice to include users:R
The ACL for file2.txt appended by alice to include Students:RW
User alice logged out
User tom logged in
User tom denied read access to file1.txt
User tom read file2.txt as:
Text from Alice in file2
User tom denied write access to file2.txt
Login failed: simultaneous login not permitted
User tom logged out
Login failed: invalid username or password
User bob logged in
User bob wrote to file2.txt: Text from Bob in file2
User bob reads file2.txt as:
Text from Alice in file2
Text from Bob in file2
User bob logged out
User tom logged in
Error with xcacls: Only file owner or member of Administrators group
may run command
User tom logged out
```

The “Notify only on change” entries should appear only if the extra credit functionality has been implemented.