Answers to Even-Numbered Exercises

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1. What is a window manager? Name two X Window System managers, and describe how they differ.

2. What happens when you position the mouse pointer in an xterm window's scrollbar and click the middle button? The right button? The left button? Do these techniques work for all scrollbars?

   Clicking the middle button moves the thumb (the moveable part of the scrollbar) to the location of the mouse pointer, adjusting the text accordingly. If you keep the button depressed, you can drag the thumb and the text with it.

   Clicking the right button scrolls the text in the window down so you can see text that appears earlier in the document, while the left button scrolls the text up.

   These techniques do not work with most other types of scrollbars.

3. Describe three ways to

   a. Change the size of a window.

   b. Delete a window.

4. When the characters you type do not appear on the screen, what might be wrong? How can you fix it?

Assuming that you are working with a GUI environment that is otherwise functioning properly and that the keyboard is plugged in, the input focus is probably not directed to a window that can receive input from the keyboard. Move the mouse over the window where you want the characters to appear, and click. Now that window should have the input focus and the characters you type should appear there.

Some windows, such as a browser, do not normally accept input from the keyboard; even though the window has the input focus nothing appears when you type.

5. Given two computer systems, **bravo** and **kudos,** that can communicate over a network, explain what the following command line does:

```
bravo% xterm –sb –title bravo –display kudos:0.0 &
```

6. Many X applications use the **–fn** option to specify a font. The following **.Xdefaults** entries exist on the system named **bravo** but not on **kudos:**

```
XTerm*saveLines: 100
*Font: 10x20
XTe*title: Terminal Emulator
```

Describe fully the characteristics of the xterm window that is opened on **bravo** by each of the following:

The XTe*title line does not affect instances of xterm because the asterisk matches only complete application names. The *font line affects all applications that have a Font resource.

a. Giving the command **xterm &**

opens an xterm window with 100 save lines, a 10x20 font, a scroll bar, and a display on **bravo.**

b. Giving the command **xterm –sb &**

opens an xterm window with 100 save lines, a 10x20 font, a scroll bar, and a display on **bravo.**

c. Giving the command **xterm –fn 5x8 &**

opens an xterm window with 100 save lines, a 5x8 font, a scroll bar, and a display on **bravo.**

d. Giving the command **xterm –display kudos:0.0 &**

opens an xterm window with 100 save lines, a 5x8 font, a scroll bar, and a display on **kudos.**

On **kudos,** what is the effect of the following command line:

```
$ xterm -display bravo:0.0 &
```

The preceding command opens an xterm window with the default values for xterm resources on **kudos** and a display on **bravo.**

7. List at least three ways that a window manager differs from a desktop manager.

8. What is the main function of the main menu? What is this menu called under KDE? GNOME?

   The main menu is an interface to many of the applications, programs, and higher-level utilities on the system. KDE refers to it as the K Menu, while GNOME calls it the GNOME Menu. Red Hat refers to both of them as the Red Hat Menu.

9. Explain the purpose of MIME. How does it facilitate your use of a GUI?

10. What is a terminal emulator? What does it allow you to do from a GUI that you would not be able to do without one?

    A terminal emulator emulates a terminal in a graphical environment. It provides a shell command line interface from which you can give shell commands, which you cannot do otherwise from a GUI (other than by using Run Command in the main menu).

11. Can you use Metacity under KDE? Explain why or why not.

12. What is input focus? When no window has the input focus, what happens to the letters you type on the keyboard? Which type of input focus do you think you would like to work with? Why?

    Input focus specifies the window that receives keyboard input. When no window has the input focus, keyboard input is lost. The final question is user specific.

13. What are the functions of a Window Operations menu? How do you display this menu?

Advanced Exercises

14. Try the experiment described in "Window Manager without a Desktop Manager" on page 181. What is missing from the screen? Based only on what you see, describe what a window manager provides. How does a desktop manager make it easier to work with a GUI?

    The desktop or root window and Panel are missing. A window manager displays a window running a program and allows you to manipulate the window. A desktop manager provides additional tools that allow you to work with windows including a Panel and root window.

15. Add the following customization: When you position the mouse pointer anywhere on the border of a window and press the middle mouse button, that window drops below any of the windows that overlap it.

16. How can you run pico (page 49) on a remote display or workstation?

    ```
    $ xterm –display bravo:0.0 –e pico
    ```

    The preceding command runs pico on the GUI interface on **bravo**. See the tip named "xhost Grants Access to a Display" on page 195 if you are not allowed access to the display you are trying to use (**bravo:0.0** in this example).

17. Write an xeyes command to display a window that is 600 pixels wide and 400 pixels tall, is located 200 pixels from the right edge of the screen and 300 pixels from the top of the screen, and contains orange eyes outlined in blue with red pupils. (*Hint:* Refer to the xeyes man page.)

18. Try the experiment described in the optional box on page 173. You may want to redirect the output to a file so that you can review it at your leisure. Name five events and explain what you did to generate the event. Make sure to include a mouse, focus, and key event.

    MotionNotify: move mouse
    Keypress: press a key
    KeyRelease: release a key
    ButtonPress: click a mouse button
    Button Release: release a mouse button
    LeaveNotify: move the mouse pointer into the box or titlebar
    EnterNotify: move the mouse pointer out of the box or titlebar (and into

the main part of the window)
Motion Notify: move the mouse pointer

a. Why would you use tee instead of a > symbol to redirect the output?

Use tee to see the output and capture it in a file.

b. What problem does using tee create?

The tee utility buffers the output so that you do not see it in real time.

c. Use grep to filter out all but the first line of motion event reports. Does this make it easier to understand the output?

```
$ xev | grep "^[A-Z]"
```

Yes, it gets rid of output that is not important to this experiment.

d. Can you think of other ways that would make the output easier to understand?

You can use uniq to filter out sequential MotionNotify events:

```
$ xev | grep "^[A-Z]" > xev.hold
$ uniq xev.hold | less
```

When you use a pipe to connect the output of grep to uniq, the buffering makes the xev report very hard to follow.

19. What is the relationship between the X Window System, a window manager, and an application program. Are applications window-manager specific? Do applications inherit properties from a window manager?

20. What parts of a window are controlled by the window manger? By the application that is running in the window?

The window manager controls the window decoration (the titlebar and everything outside the window border but belonging to the window), size, and placement. The application controls the contents of the window.