

Name: _____

(Put your answers on the back)

1. Use the following URL to define the term "focus" in the context of computing:

`http://en.wikipedia.org/wiki/Focus`

Copy the files needed for this lab (including the Makefile!) and build it. Answer the following questions using the textbook, the source code, by running the program, and/or by consulting on-line GLUT API documentation at

`www.opengl.org/resources/libraries/glut/spec3/spec3.html`

2. What is the purpose of the `display` callback?
3. List in order the callback(s) that is/are called when a GLUT program first begins.
4. Drag the shell window so it *completely obscures* the GLUT window. What callback(s) is/are called as a result?
5. Drag the shell window so the GLUT window is *completely exposed*. What callback(s) is/are called as a result?
6. Drag the shell window so the GLUT window is *partially exposed*. What callback(s) is/are called as a result?

For the remaining questions, assume the GLUT window has focus.

7. What callback(s) is/are called when a GLUT window is minimized?
8. What callback(s) is/are called when a GLUT window is restored?
9. What are the coordinates of each edge of the GLUT window?
10. What callback(s) did you use to answer question #9 ?
11. What callback(s) is/are called when a keyboard key is pressed once?
12. Press and hold a keyboard key down. What happens?
13. With the mouse cursor in the GLUT window and without moving the mouse, press and hold a mouse button down. What happens?
14. What callback(s) is/are called when the following sequence is performed with the mouse cursor in the GLUT window: mouse button pressed and held down, mouse moved in the window, mouse button released?
15. Specifically, how would a program determine which mouse button was pressed?
16. Specifically, how would a program determine if a mouse button went down or went up?
17. Is the `glutPassiveMotionFunc` callback called when the mouse is moved outside of the window?
18. Is the `glutMotionFunc` callback called when the mouse is outside of the window and moved?
19. Is the keyboard callback called if a keyboard key is pressed with the mouse cursor outside of the window?
20. Register a timer callback by uncommenting the following line in `init.cpp`:

```
// glutTimerFunc(1000, timer, 0);
```

Recompile and run. How many times is the timer callback called?

21. Uncomment the following line in `callbacks.cpp`:

```
// glutTimerFunc(1000, timer, val+1);
```

Recompile and run. What happens?

22. Minimize the GLUT window. Is the timer callback still called?
23. Uncomment the following line in `callbacks.cpp`:

```
// cout << "idle" << endl;
```

Recompile and run. What happens?

24. Minimize the GLUT window. Is the timer callback still called?

Answers:

1. Focus:

2. Display callback:

3. _____

4. _____

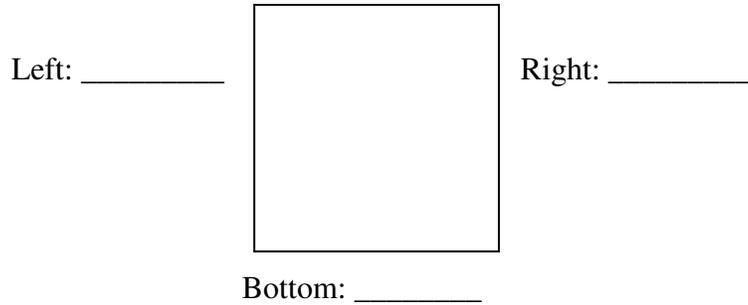
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