```cpp
 1: // $Id: menus.cpp,v 1.4 2014-05-09 16:54:10-07 - - $
 2:
 3: #include <cmath>
 4: #include <map>
 5: #include <iostream>
 6: #include <string>
 7: using namespace std;
 8:
 9: #include <GL/freeglut.h>
10: #include <libgen.h>
11:
12: int window_width  = 256;
13: int window_height = 192;
14: string program_name;
15:
16: enum shape_type {RECTANGLE, SQUARE, DIAMOND, ELLIPSE, CIRCLE};
17: map<shape_type,string> shape_map{
18:    {RECTANGLE, "Rectangle"},
19:    {SQUARE, "Square"},
20:    {DIAMOND, "Diamond"},
21:    {ELLIPSE, "Ellipse"},
22:    {CIRCLE, "Circle"},
23: };
24:
25: void main_menu (int value) {
26:    cout << "main_menu(" << value << ")" << endl;
27: }
28:
29: void shape_menu (int value) {
30:    shape_type shape = static_cast<shape_type> (value);
31:    cout << __func__ << "(" << value << ") [" << shape_map[shape]
32:        << "]" << endl;
33: }
34:
35: void quit_menu (int value) {
36:     if (value) exit (0);
37: }
38:
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39:
40: void createmenu() {
41:     int shape_menu_id = glutCreateMenu (shape_menu);
42:     cout << __func__ << ": shape_menu_id=" << shape_menu_id << endl;
43:     glutAddMenuEntry ("Rectangle", RECTANGLE);
44:     glutAddMenuEntry ("Square", SQUARE);
45:     glutAddMenuEntry ("Diamond", DIAMOND);
46:     glutAddMenuEntry ("Ellipse", ELLIPSE);
47:     glutAddMenuEntry ("Circle", CIRCLE);
48:     int quit_menu_id = glutCreateMenu (quit_menu);
49:     glutAddMenuEntry ("Confirm", true);
50:     glutAddMenuEntry ("Cancel", false);
51:     int main_menu_id = glutCreateMenu (main_menu);
52:     cout << __func__ << ": main_menu_id=" << main_menu_id << endl;
53:     glutAddSubMenu ("Draw", shape_menu_id);
54:     glutAddSubMenu ("Quit", quit_menu_id);
55:     glutAttachMenu (GLUT_LEFT_BUTTON);
56: }
57:
58: void display() {
59:     glClear (GL_COLOR_BUFFER_BIT);
60:     glutSwapBuffers();
61: }
62:
63: void reshape (int width, int height) {
64:     cout << width << "x" << height << endl;
65:     glMatrixMode (GL_PROJECTION);
66:     glLoadIdentity();
67:     gluOrtho2D (0, window_width, 0, window_height);
68:     glClearColor (0.2, 0.2, 0.2, 1.0);
69:     glMatrixMode (GL_MODELVIEW);
70: }
71:
72: int main (int argc, char** argv) {
73:     program_name = basename (argv[0]);
74:     glutInit (&argc, argv);
75:     glutInitDisplayMode (GLUT_RGBA | GLUT_DOUBLE);
76:     glutInitWindowSize (window_width, window_height);
77:     glutCreateWindow (program_name.c_str());
78:     glutDisplayFunc (display);
79:     glutReshapeFunc (reshape);
80:     createmenu();
81:     glutMainLoop();
82:     return 0;
83: }
84:
```

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1: @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: starting menus.cpp
2: menus.cpp:
3:      $Id: menus.cpp,v 1.4 2014-05-09 16:54:10-07 - - $
4: g++ -g -O0 -Wall -Wextra -rdynamic -std=gnu++14 menus.cpp
5:          -o menus -lglut -lGLU -lGL -lX11 -lrt -lm
6: rm -f menus.o
7: @@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@ mkc: finished menus.cpp
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