

```

1  #include <windows.h>
2  #include<stdio.h>
3  #include<GL/glut.h>
4
5  ////////////////////////////////////////////////// Declaration of global variables ///////////////////////////////////
6  float y=0,ang=0,i=0,k=0,n=0;
7
8  float a=900,b=880,c=900,d=900,p,q=0,s;
9
10 float m=.80,j=.50,o=.15;
11
12
13 /////////////// sea function to display river ///////////////////
14
15
16 void sea()
17 {
18
19     glBegin(GL_POLYGON);
20     glColor3f(0.0,0.50,1.0);
21     glVertex2f(0.0,0.0);
22     glVertex2f(2000.0,0.0);
23     glVertex2f(2000.0,1600.0);
24     glVertex2f(0.0,1600.0);
25     glEnd();
26
27
28     glPushMatrix();
29     glTranslatef(0,q,0);
30
31     glBegin(GL_LINES);
32     glColor3f(1.0,1.0,1.0);
33     for(p=0;p<20000;p=p+100)
34         for(s=0;s<20000;s=s+100)
35             glVertex2f(100.0+s,100.0+p);
36             glVertex2f(200.0+s,100.0+p);
37     glEnd();
38
39
40     glPopMatrix();
41 }
42
43 /////////////// Bridge function ///////////////////////////////////
44
45 void bridge()
46 {
47     glBegin(GL_POLYGON);
48     glColor3f(0.40,0.40,0.40);
49     glVertex2f(0.0,900.0);
50     glVertex2f(500.0,900.0);
51     glVertex2f(500.0,1200.0); //bridge top 1
52     glVertex2f(0.0,1200.0);
53     glEnd();
54
55     glBegin(GL_POLYGON);
56     glColor3f(1.0,1.0,1.0);
57     glVertex2f(100.0,1030.0);
58     glVertex2f(200.0,1030.0);
59     glVertex2f(200.0,1040.0); //stripl
60     glVertex2f(100.0,1040.0);
61     glEnd();
62
63
64     glBegin(GL_POLYGON);
65     glColor3f(1.0,1.0,1.0);
66     glVertex2f(300.0,1030.0);

```

```

67     glVertex2f(400.0,1030.0);
68     glVertex2f(400.0,1040.0);    //strip2
69     glVertex2f(300.0,1040.0);
70 glEnd();
71
72
73 glBegin(GL_POLYGON);
74     glColor3f(1.0,1.0,.0);
75     glVertex2f(0.0,1170.0);
76     glVertex2f(500.0,1170.0);
77     glVertex2f(500.0,1175.0);    //yellow strip1
78     glVertex2f(0.0,1175.0);
79 glEnd();
80
81
82 glBegin(GL_POLYGON);
83     glColor3f(1.0,1.0,0.0);
84     glVertex2f(0.0,920.0);
85     glVertex2f(500.0,920.0);
86     glVertex2f(500.0,930.0);    //yellow strip2
87     glVertex2f(0.0,930.0);
88 glEnd();
89
90 //   brige up
91
92 glPushMatrix();
93
94 glBegin(GL_POLYGON);
95     glColor3f(0.46,0.46,0.46);
96     glVertex2f(500.0,900.0);    //bridge top 2
97     //up
98     glVertex2f(900.0-k,900.0+n);
99     glVertex2f(900.0-k,1200.0+n);
100    //up
101    glVertex2f(500.0,1200.0);
102 glEnd();
103
104
105
106
107 glBegin(GL_LINES);
108     glColor3f(0.0,0.0,0.0);
109     glVertex2f(20.0,1400.0);
110     glVertex2f(900.0-k,900.0+n);    //pole thread front
111     glVertex2f(0.0,1400.0);
112     glVertex2f(900.0-k,880.0+n);
113 glEnd();
114
115
116 glBegin(GL_LINES);
117     glColor3f(0.0,0.0,0.0);
118     glVertex2f(30.0,1550.0);
119     glVertex2f(900.0-k,1200.0+n);    //pole thread back
120     glVertex2f(50.0,1550.0);
121     glVertex2f(900.0-k,1203.0+n);
122 glEnd();
123
124
125
126 glBegin(GL_POLYGON);
127     glColor3f(0.0,0.0,0.0);
128     glVertex2f(500.0,880.0);
129     glVertex2f(900.0-k,880.0+n); //base1
130     glVertex2f(900.0-k,900.0+n);
131     glVertex2f(500.0,900.0);
132 glEnd();

```

```

133
134
135     glBegin(GL_POLYGON);
136         glColor3f(0.46,0.46,0.46);
137         glVertex2f(900.0+k,900.0+n);
138         //up
139         glVertex2f(1300.0,900.0);    // bridge top3
140         glVertex2f(1300.0,1200.0);
141         //up
142         glVertex2f(900.0+k,1200.0+n);
143     glEnd();
144
145
146     glBegin(GL_POLYGON);
147         glColor3f(0.0,0.0,0.0);
148         glVertex2f(900.0+k,880.0+n);
149         glVertex2f(1300.0,880.0);    // base 2
150         glVertex2f(1300.0,900.0);
151         glVertex2f(900.0+k,900.0+n);
152     glEnd();
153 glPopMatrix();
154
155
156
157     glBegin(GL_POLYGON);
158         glColor3f(0.40,0.40,0.40);
159         glVertex2f(1300.0,900.0);
160         glVertex2f(2000.0,900.0);    //bridge top 4
161         glVertex2f(2000.0,1200.0);
162         glVertex2f(1300.0,1200.0);
163     glEnd();
164
165     glBegin(GL_POLYGON);
166         glColor3f(1.0,1.0,0.0);
167         glVertex2f(1300.0,1170.0);
168         glVertex2f(2000.0,1170.0);
169         glVertex2f(2000.0,1175.0);    //yellow strip3
170         glVertex2f(1300.0,1175.0);
171     glEnd();
172     glBegin(GL_POLYGON);
173         glColor3f(1.0,1.0,0.0);
174         glVertex2f(1300.0,920.0);
175         glVertex2f(2000.0,920.0);
176         glVertex2f(2000.0,930.0);    // yellow strip4
177         glVertex2f(1300.0,930.0);
178     glEnd();
179
180     glBegin(GL_POLYGON);
181         glColor3f(1.0,1.0,1.0);
182         glVertex2f(1400.0,1030.0);
183         glVertex2f(1500.0,1030.0);
184         glVertex2f(1500.0,1040.0);    //strip3
185         glVertex2f(1400.0,1040.0);
186     glEnd();
187
188     glBegin(GL_POLYGON);
189         glColor3f(1.0,1.0,1.0);
190         glVertex2f(1600.0,1030.0);
191         glVertex2f(1700.0,1030.0);
192         glVertex2f(1700.0,1040.0);    //strip4
193         glVertex2f(1600.0,1040.0);
194     glEnd();
195
196     glBegin(GL_POLYGON);
197         glColor3f(1.0,1.0,1.0);
198         glVertex2f(1800.0,1030.0);

```

```

199     glVertex2f(1900.0,1030.0);
200     glVertex2f(1900.0,1040.0);    //strip5
201     glVertex2f(1800.0,1040.0);
202 glEnd();
203
204
205 glBegin(GL_LINES);
206     glColor3f(0.0,0.0,0.0);
207     glVertex2f(1725.0,1550.0);
208     glVertex2f(900.0+k,1200.0+n);    //rite pole thread
209     glVertex2f(1745.0,1550.0);
210     glVertex2f(900.0+k,1200.0+n);
211 glEnd();
212
213 glBegin(GL_LINES);
214     glColor3f(0.0,0.0,0.0);
215     glVertex2f(1750.0,1400.0);
216     glVertex2f(900.0+k,900.0+n);    //right pole thread front
217     glVertex2f(1770.0,1400.0);
218     glVertex2f(900.0+k,880.0+n);
219 glEnd();
220
221 glBegin(GL_POLYGON);
222     glColor3f(0.25,0.25,0.25);
223     glVertex2f(200.0,800.0);    //6 point polygon 1
224     glVertex2f(200.0,700.0);
225     glVertex2f(300.0,700.0);
226     glVertex2f(300.0,800.0);
227     glVertex2f(350.0,880.0);
228     glVertex2f(150.0,880.0);
229 glEnd();
230
231 glBegin(GL_POLYGON);
232     glColor3f(0.0,0.0,0.0);
233     glVertex2f(0.0,880.0);
234     glVertex2f(500.0,880.0);    //base3
235     glVertex2f(500.0,900.0);
236     glVertex2f(0.0,900.0);
237 glEnd();
238 //
239 glBegin(GL_POLYGON);
240     glColor3f(0.0,0.0,0.0);    //base4
241     glVertex2f(1300.0,880.0);
242     glVertex2f(2000.0,880.0);
243     glVertex2f(2000.0,900.0);
244     glVertex2f(1300.0,900.0);
245 glEnd();
246
247 glBegin(GL_POLYGON);
248     glColor3f(0.25,0.25,0.25);
249     glVertex2f(1500.0,800.0);
250     glVertex2f(1500.0,700.0);
251     glVertex2f(1600.0,700.0);    //6 point polygon2
252     glVertex2f(1600.0,800.0);
253     glVertex2f(1650.0,880.0);
254     glVertex2f(1450.0,880.0);
255 glEnd();
256
257
258 }
259
260 ////////////////////////////////////////////////// Boat function //////////////////////////////////////
261
262 void boat()
263 {
264     //glTranslatef(0,-250,0);

```

```

265     glPushMatrix();
266
267     glTranslatef(0,y,0);
268     glPushMatrix();
269     glBegin(GL_POLYGON);
270     glColor3f(m,j,o);
271     glVertex2f(900.0,700.0);
272     glVertex2f(800.0,620.0);
273     glVertex2f(750.0,500.0);
274     glVertex2f(750.0,200.0);    //ship
275     glVertex2f(900.0,50.0);
276     glVertex2f(1050.0,200.0);
277     glVertex2f(1050.0,500.0);
278     glVertex2f(1000.0,620.0);
279
280     glEnd();
281
282
283     glBegin(GL_POLYGON);
284     glColor3f(0.0,0.0,0.0);    // ship back 1
285     glVertex2f(750.0,200.0);
286     glVertex2f(900.0,0.0);
287     glVertex2f(900.0,50.0);
288     glVertex2f(751.0,200.0);
289     glEnd();
290
291     glBegin(GL_POLYGON);
292     glColor3f(0.1,0.1,0.1);
293     glVertex2f(901.0,0.0);    //ship back 2
294     glVertex2f(1050.0,200.0);
295     glVertex2f(901.0,50.0);
296     glEnd();
297
298
299     glBegin(GL_LINES);
300     glColor3f(0.0,0.0,0.0);
301     glVertex2f(900.0,700.0);
302     glVertex2f(820.0,600.0);    //boat grill
303     glVertex2f(820.0,600.0);
304     glVertex2f(800.0,620.0);
305     glVertex2f(820.0,600.0);
306     glVertex2f(770.0,500.0);
307     glVertex2f(770.0,500.0);
308     glVertex2f(750.0,500.0);
309     glVertex2f(770.0,500.0);
310     glVertex2f(770.0,200.0);
311     glVertex2f(770.0,200.0);
312     glVertex2f(750.0,200.0);
313     glVertex2f(770.0,200.0);
314     glVertex2f(900.0,70.0);
315     glVertex2f(900.0,70.0);
316     glVertex2f(900.0,50.0);
317     glVertex2f(900.0,70.0);
318     glVertex2f(1030.0,200.0);
319     glVertex2f(1030.0,200.0);
320     glVertex2f(1050.0,200.0);
321     glVertex2f(1030.0,200.0);
322     glVertex2f(1030.0,500.0);
323     glVertex2f(1030.0,500.0);
324     glVertex2f(1050.0,500.0);
325     glVertex2f(1030.0,500.0);
326     glVertex2f(980.0,620.0);
327     glVertex2f(980.0,620.0);
328     glVertex2f(1000.0,620.0);
329     glVertex2f(980.0,620.0);
330     glVertex2f(900.0,700.0);

```

```

331     glVertex2f(770.0,350.0);
332     glVertex2f(750.0,350.0);
333     glVertex2f(770.0,450.0);
334     glVertex2f(750.0,450.0);
335     glVertex2f(770.0,250.0);
336     glVertex2f(750.0,250.0);
337     glVertex2f(1030.0,250.0);
338     glVertex2f(1050.0,250.0);
339     glVertex2f(1030.0,350.0);
340     glVertex2f(1050.0,350.0);
341     glVertex2f(1030.0,450.0);
342     glVertex2f(1050.0,450.0);
343     glVertex2f(840.0,130.0);
344     glVertex2f(820.0,110.0);
345     glVertex2f(975.0,110);
346     glVertex2f(955.0,125.0);
347 glEnd();
348
349
350
351 glBegin(GL_POLYGON);
352     glColor3f(0.10,0.10,0.);
353     glVertex2f(850.0,400.0); //boat inside polygon
354     glVertex2f(950.0,400.0);
355     glVertex2f(950.0,500.0);
356     glVertex2f(850.0,500.0);
357 glEnd();
358
359 glBegin(GL_POLYGON);
360     glColor3f(0.0,0.0,0.0);
361     glVertex2f(850.0,400.0); //table on ship1
362     glVertex2f(850.0,350.0);
363     glVertex2f(860.0,350.0);
364     glVertex2f(860.0,400.0);
365 glEnd();
366
367 glBegin(GL_POLYGON);
368     glColor3f(0.0,0.0,0.0);
369     glVertex2f(920.0,400.0); //2
370     glVertex2f(930.0,380.0);
371     glVertex2f(930.0,380.0);
372     glVertex2f(920.0,400.0);
373 glEnd();
374
375 glBegin(GL_POLYGON);
376     glColor3f(0.0,0.0,0.0);
377     glVertex2f(950.0,400.0); //3
378     glVertex2f(950.0,350.0);
379     glVertex2f(940.0,350.0);
380     glVertex2f(940.0,400.0);
381 glEnd();
382
383 glBegin(GL_POLYGON);
384     glColor3f(0.0,0.0,0.0);
385     glVertex2f(860.0,400.0);
386     glVertex2f(860.0,380.0);
387     glVertex2f(870.0,380.0); //4
388     glVertex2f(870.0,400.0);
389 glEnd();
390
391
392
393
394 glPopMatrix();
395 glPopMatrix();
396 }

```

```

397
398
399 ////////////// Pole Function //////////////
400 void poles()
401 {
402     glBegin(GL_POLYGON);                // left pole behind
403         glColor3f(0.0,0.0,0.0);
404         glVertex2f(30.0,1200.0);
405         glVertex2f(50.0,1200.0);
406         glVertex2f(50.0,1550.0);
407         glVertex2f(30.0,1550.0);
408     glEnd();
409
410
411
412     glBegin(GL_POLYGON);                // right pole behind
413         glColor3f(0.0,0.0,0.0);
414         glVertex2f(1725.0,1200.0);
415         glVertex2f(1745.0,1200.0);
416         glVertex2f(1745.0,1550.0);
417         glVertex2f(1725.0,1550.0);
418     glEnd();
419
420     glBegin(GL_POLYGON);                // left pole front
421         glColor3f(0.0,0.0,0.0);
422         glVertex2f(0.0,900.0);
423         glVertex2f(20.0,900.0);
424         glVertex2f(20.0,1400.0);
425         glVertex2f(0.0,1400.0);
426     glEnd();
427 //
428 //
429 //
430     glBegin(GL_POLYGON);                // right pole front
431         glColor3f(0.0,0.0,0.0);
432         glVertex2f(1750.0,900.0);
433         glVertex2f(1770.0,900.0);
434         glVertex2f(1770.0,1400.0);
435         glVertex2f(1750.0,1400.0);
436     glEnd();
437 }
438
439 ////////////// display function //////////////
440
441 void display(void)
442 {
443     glClear(GL_COLOR_BUFFER_BIT|GL_DEPTH_BUFFER_BIT);
444     sea();
445     bridge();
446     boat();
447     poles();
448
449     glFlush();
450     glutSwapBuffers();
451 }
452
453
454 ////////////// functio to animate bridge stripes //////////////
455
456 void animate()
457 {
458     q=q-.5;
459     y=y+0.2;
460
461     i+=0.2;
462     if((i>=135) && (i<=439))

```

```

463     {   k=k+0.1;
464         n=n+0.1;
465     }
466     if(i>=1200 && !(k<=0 && n<=0))
467     {
468         k=k-0.1;
469         n=n-0.1;
470     }
471
472     if(k<=0){
473         g-=0.5;
474     }
475     if(i>1520){
476         i=0;
477         y=0;
478         glutIdleFunc(NULL);
479     }
480
481     glutPostRedisplay();
482 }
483
484
485
486
487
488 void myinit()
489 {
490     glClearColor(1.0,1.0,1.0,1.0);
491     glColor3f(1.0,1.0,1.0);
492     glPointSize(1.0);
493     glMatrixMode(GL_PROJECTION);
494     glLoadIdentity();
495     gluOrtho2D(0.0,2000.0,0.0,1600.0);
496 }
497
498
499 //K/B function for changing boat color //
500
501 void keyboard( unsigned char key, int x, int y )
502 {
503     switch( key )
504     {
505         case '1':glutIdleFunc(animate);
506                 break;
507         case '2':
508                 glutIdleFunc(NULL);
509                 break;
510         case '3':
511                 y=0;i=0;
512                 break;
513         case 'r':m=1.0,j=0.0,o=0.0;
514                 glutPostRedisplay();
515                 break;
516
517         case 'g':m=0.0,j=1.0,o=0.0;
518                 glutPostRedisplay();
519                 break;
520
521         case 'b':m=.80,j=.50,o=0.15;
522                 glutPostRedisplay();
523                 break;
524
525         case 'w':m=1.0,j=1.0,o=1.0;
526                 glutPostRedisplay();
527                 break;
528

```



```

529         case 'm':m=1.0,j=.0,o=1.0;
530             glutPostRedisplay();
531             break;
532
533         case 'c':m=.0,j=1.0,o=1.0;
534             glutPostRedisplay();
535             break;
536
537         case 'y':m=.75,j=0.75,o=.75;
538             glutPostRedisplay();
539             break;
540
541     };
542 }
543
544
545 int main(int argc,char **argv)
546 {
547     glutInit(&argc,argv);
548     glutInitDisplayMode(GLUT_DOUBLE|GLUT_RGB);
549     glutInitWindowSize(2000,1600);
550     glutInitWindowPosition(0,0);
551     glutCreateWindow("Lift BRIDGE");
552     myinit();
553     glutDisplayFunc(display);
554
555     glClearColor (1.0, 1.0, 0.0, 1.0);
556     glutKeyboardFunc(keyboard);
557     glutMainLoop();
558     return 0;
559 }
560
561

```