```c
#include <windows.h>
#include<stdio.h>
#include<GL/glut.h>

//////////////////// Declaration of global variables   ////////////////////////
float y=0,ang=0,i=0,k=0,n=0;

float a=900,b=880,c=900,d=900,p,q=0,s;

float m=.80,j=.50,o=.15;


/////////// sea function to display river   ////////////


void sea()
{

    glBegin(GL_POLYGON);
        glColor3f(0.0,0.50,1.0);
        glVertex2f(0.0,0.0);
        glVertex2f(2000.0,0.0);
        glVertex2f(2000.0,1600.0);
        glVertex2f(0.0,1600.0);
    glEnd();


  glPushMatrix();
  glTranslatef(0,q,0);

    glBegin(GL_LINES);
        glColor3f(1.0,1.0,1.0);
   for(p=0;p<20000;p=p+100)
       for(s=0;s<20000;s=s+100)
        glVertex2f(100.0+s,100.0+p);
        glVertex2f(200.0+s,100.0+p);
    glEnd();


  glPopMatrix();
}

////////////////////  Bridge function  ///////////////

void bridge()
{
    glBegin(GL_POLYGON);
        glColor3f(0.40,0.40,0.40);
        glVertex2f(0.0,900.0);
        glVertex2f(500.0,900.0);
        glVertex2f(500.0,1200.0);   //bridge top 1
        glVertex2f(0.0,1200.0);
    glEnd();

    glBegin(GL_POLYGON);
        glColor3f(1.0,1.0,1.0);
        glVertex2f(100.0,1030.0);
        glVertex2f(200.0,1030.0);
        glVertex2f(200.0,1040.0);   //strip1
        glVertex2f(100.0,1040.0);
    glEnd();


    glBegin(GL_POLYGON);
        glColor3f(1.0,1.0,1.0);
        glVertex2f(300.0,1030.0);
```

```
        glVertex2f(400.0,1030.0);
        glVertex2f(400.0,1040.0);   //strip2
        glVertex2f(300.0,1040.0);
    glEnd();


    glBegin(GL_POLYGON);
        glColor3f(1.0,1.0,.0);
        glVertex2f(0.0,1170.0);
        glVertex2f(500.0,1170.0);
        glVertex2f(500.0,1175.0);   //yellow strip1
        glVertex2f(0.0,1175.0);
    glEnd();


    glBegin(GL_POLYGON);
        glColor3f(1.0,1.0,0.0);
        glVertex2f(0.0,920.0);
        glVertex2f(500.0,920.0);
        glVertex2f(500.0,930.0);   //yellow strip2
        glVertex2f(0.0,930.0);
    glEnd();

    //   brige up

    glPushMatrix();

    glBegin(GL_POLYGON);
        glColor3f(0.46,0.46,0.46);
        glVertex2f(500.0,900.0);             //bridge top 2
        //up
        glVertex2f(900.0-k,900.0+n);
        glVertex2f(900.0-k,1200.0+n);
        //up
        glVertex2f(500.0,1200.0);
    glEnd();




    glBegin(GL_LINES);
        glColor3f(0.0,0.0,0.0);
        glVertex2f(20.0,1400.0);
        glVertex2f(900.0-k,900.0+n);    //pole thread front
        glVertex2f(0.0,1400.0);
        glVertex2f(900.0-k,880.0+n);
    glEnd();


    glBegin(GL_LINES);
        glColor3f(0.0,0.0,0.0);
        glVertex2f(30.0,1550.0);
        glVertex2f(900.0-k,1200.0+n);   //pole thread back
        glVertex2f(50.0,1550.0);
        glVertex2f(900.0-k,1203.0+n);
    glEnd();



    glBegin(GL_POLYGON);
        glColor3f(0.0,0.0,0.0);
        glVertex2f(500.0,880.0);
        glVertex2f(900.0-k,880.0+n); //base1
        glVertex2f(900.0-k,900.0+n);
        glVertex2f(500.0,900.0);
    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);
```

```
        glVertex2f(1900.0,1030.0);
        glVertex2f(1900.0,1040.0);   //strip5
        glVertex2f(1800.0,1040.0);
    glEnd();


    glBegin(GL_LINES);
        glColor3f(0.0,0.0,0.0);
        glVertex2f(1725.0,1550.0);
        glVertex2f(900.0+k,1200.0+n);    //rite pole thread
        glVertex2f(1745.0,1550.0);
        glVertex2f(900.0+k,1200.0+n);
        glEnd();

    glBegin(GL_LINES);
        glColor3f(0.0,0.0,0.0);
        glVertex2f(1750.0,1400.0);
        glVertex2f(900.0+k,900.0+n);    //right pole thread front
        glVertex2f(1770.0,1400.0);
        glVertex2f(900.0+k,880.0+n);
    glEnd();

    glBegin(GL_POLYGON);
        glColor3f(0.25,0.25,0.25);
        glVertex2f(200.0,800.0);   //6 point polygon 1
        glVertex2f(200.0,700.0);
        glVertex2f(300.0,700.0);
        glVertex2f(300.0,800.0);
        glVertex2f(350.0,880.0);
        glVertex2f(150.0,880.0);
        glEnd();

    glBegin(GL_POLYGON);
        glColor3f(0.0,0.0,0.0);
        glVertex2f(0.0,880.0);
        glVertex2f(500.0,880.0);   //base3
        glVertex2f(500.0,900.0);
        glVertex2f(0.0,900.0);
    glEnd();
//
    glBegin(GL_POLYGON);
        glColor3f(0.0,0.0,0.0);    //base4
        glVertex2f(1300.0,880.0);
        glVertex2f(2000.0,880.0);
        glVertex2f(2000.0,900.0);
        glVertex2f(1300.0,900.0);
    glEnd();

    glBegin(GL_POLYGON);
        glColor3f(0.25,0.25,0.25);
        glVertex2f(1500.0,800.0);
        glVertex2f(1500.0,700.0);
        glVertex2f(1600.0,700.0);  //6 point polygon2
        glVertex2f(1600.0,800.0);
        glVertex2f(1650.0,880.0);
        glVertex2f(1450.0,880.0);
    glEnd();


}

//////////////////////  Boat function  ////////////////////

void boat()
{
        //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);
```

```
        glVertex2f(770.0,350.0);
        glVertex2f(750.0,350.0);
        glVertex2f(770.0,450.0);
        glVertex2f(750.0,450.0);
        glVertex2f(770.0,250.0);
        glVertex2f(750.0,250.0);
        glVertex2f(1030.0,250.0);
        glVertex2f(1050.0,250.0);
        glVertex2f(1030.0,350.0);
        glVertex2f(1050.0,350.0);
        glVertex2f(1030.0,450.0);
        glVertex2f(1050.0,450.0);
        glVertex2f(840.0,130.0);
        glVertex2f(820.0,110.0);
        glVertex2f(975.0,110);
        glVertex2f(955.0,125.0);
    glEnd();



        glBegin(GL_POLYGON);
            glColor3f(0.10,0.10,0.);
            glVertex2f(850.0,400.0);   //boat inside polygon
            glVertex2f(950.0,400.0);
            glVertex2f(950.0,500.0);
            glVertex2f(850.0,500.0);
        glEnd();

        glBegin(GL_POLYGON);
            glColor3f(0.0,0.0,0.0);
            glVertex2f(850.0,400.0);//table on ship1
            glVertex2f(850.0,350.0);
            glVertex2f(860.0,350.0);
            glVertex2f(860.0,400.0);
            glEnd();

        glBegin(GL_POLYGON);
            glColor3f(0.0,0.0,0.0);
            glVertex2f(920.0,400.0);//2
            glVertex2f(930.0,380.0);
            glVertex2f(930.0,380.0);
            glVertex2f(920.0,400.0);
        glEnd();

        glBegin(GL_POLYGON);
            glColor3f(0.0,0.0,0.0);
            glVertex2f(950.0,400.0);//3
            glVertex2f(950.0,350.0);
            glVertex2f(940.0,350.0);
            glVertex2f(940.0,400.0);
        glEnd();

        glBegin(GL_POLYGON);
            glColor3f(0.0,0.0,0.0);
            glVertex2f(860.0,400.0);
            glVertex2f(860.0,380.0);
            glVertex2f(870.0,380.0);//4
            glVertex2f(870.0,400.0);
        glEnd();



     glPopMatrix();
    glPopMatrix();
}
```

```
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))
```

```
    {   k=k+0.1;
        n=n+0.1;
    }
    if(i>=1200 && !(k<=0 && n<=0))
    {
        k=k-0.1;
        n=n-0.1;
    }

    if(k<=0){
        g-=0.5;
    }
    if(i>1520){
        i=0;
        y=0;
        glutIdleFunc(NULL);
    }

    glutPostRedisplay();
}




void myinit()
{
    glClearColor(1.0,1.0,1.0,1.0);
    glColor3f(1.0,1.0,1.0);
    glPointSize(1.0);
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(0.0,2000.0,0.0,1600.0);
}


///////   K/B function for changing boat color  ////////

void keyboard( unsigned char key, int x, int y )
{
    switch( key )
    {
        case '1':glutIdleFunc(animate);
                 break;
        case '2':
                 glutIdleFunc(NULL);
                 break;
        case '3':
                y=0;i=0;
                 break;
        case 'r':m=1.0,j=0.0,o=0.0;
                 glutPostRedisplay();
                 break;

        case 'g':m=0.0,j=1.0,o=0.0;
                 glutPostRedisplay();
                 break;

        case 'b':m=.80,j=.50,o=0.15;
                 glutPostRedisplay();
                 break;

        case 'w':m=1.0,j=1.0,o=1.0;
                 glutPostRedisplay();
                 break;

```

```
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 
```