GRAFIKA KOMPUTER

GAME SIMULASI PARKIR MOBIL

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UNIVERSITAS UDAYANA

2019

DAFTAR ISI

PENDAHULUAN

1.1 Latar Belakang

Transportasi merupakan hal yang sangat penting bagi kelangsungan kehidupan manusia, dimana transportasi menjadi sebuah kendaraan yang digunakan untuk berpindah dari satu tempat ke tempat lainnya. Transportasi sudah tidak bisa dipisahkan dalam kehidupan manusia khususnya di Indonesia, lebih dari 138 juta kendaraan yang digunakan oleh orang Indonesia.

Mobil merupakan salah satu transportasi yang digunakan oleh manusia, kendaraan ini biasanya menampung sebanyak 4 orang. Namun tidak banyak pula manusia yang bisa mengendarai kendaraan tersebut tanpa latihan, latihan disini sangatlah penting sebelum mengendarai mobil di jalan sungguhan. Maka diperlukan adanya latihan agar pengemudi/manusia tersebut dapat memahami bagaimana cara mengemudi mobil yang baik dan benar, dan yang tersulit dari mengemudikan mobil adalah bagaimana cara kita memakirkan mobil, belum lagi terdapat banyak rintangan seperti tempat parkirnya kecil, dan sebagainya.

Karena permasalahan tersebut, kami memiliki ide untuk membuat sebuah simulasi yang dimana dalam simulasi tersebut, pengguna bisa mengemudikan mobilnya dengan leluasa. Simulasi ini kami buat menggunakan OpenGL yang terdapat pada C++.

OpenGL merupakan library yang terdapat pada IDE yang terdiri dari berbagai macam fungsi dan biasanya digunakan untuk menggambarkan sebuah atau beberapa objek 2 dimensi maupun 3 dimensi. Library-library ini mendefinisikan sebuah cross-bahasa, cross-platform API (antarmuka pemrograman aplikasi) untuk menulis aplikasi yang menghasilkan komputer 2D dan 3D grafis. Bahasa pemrograman yang digunakan pada umumnya adalah pemrograman C/C++.

1.2 Tujuan

Terdapat tujuan dari pembuatan laporan ini, sebagai berikut:

- Mengetahui bagaimana cara menggunakan OpenGL pada C++
- Mengetahui bagaimana cara membuat gambar 3 dimensi menggunakan OpenGL

1.3 Manfaat

Selain tujuan, terdapat pula manfaat dari pembuatan laporan ini, sebagai berikut:

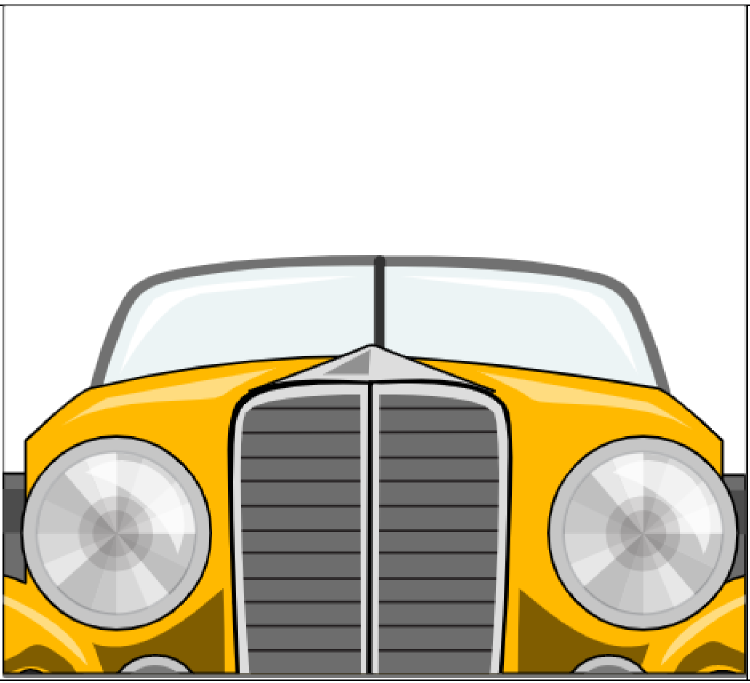
- Mahasiswa dapat memahami dan mengetahui bagaimana cara menggunakan OpenGL pada C++ untuk membuat sebuah gambar 3 dimensi.

BAB II
METODE PENELITIAN

2.1 Story Board

Scene	Board	Keterangan
1		Terdapat tempat parkir, yang dimana tempar parkir ini digunakan sebagai tempat parkir mobil.
2		Terdapat beberapa mobil pada parkiran, yang dimana digunakan sebagai penghalang agar mobil utama tidak mudah untuk masuk/mencapai garasi.

3		Terdapat rumah yang berisi garasi, yang dimana mobil utama harus sampai pada tempat ini dengan melewati penghalang yang berada pada tempat parkir.
4		Garasi merupakan tempat finish, yang dimana mobil utama harus berhasil parkir di garasi.

5		Ini merupakan mobil utama, kita bisa menggerakkan mobil tersebut dengan melewati penghalang agar bisa sampai pada garasi rumah dan memarkirkannya dengan benar

2.2 Object

- Mobil

  Dalam pembuatan mobil, kami menggunakan source code sebagai berikut:

```
void drawcarr()
{
glTranslatef(.0,0.8,0.0);
glEnable(GL_BLEND);//TRANCPARENCY1
  glBlendFunc(GL_ONE, GL_ZERO);//TRANCPARENCY2
   //glColor3f(1.0,1.0,1.0);
  // glBegin(
   //glVertex3f(

glBegin(GL_LINE_LOOP);
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-.42,-.2,0.7);//d
 glVertex3f(-0.3,-.48,0.7);//e
 glVertex3f(.81,-0.48,0.7);//f
 glVertex3f(.94,-0.2,0.7);//g
 glVertex3f(1.24,-.2,0.7);//h
 glVertex3f(1.38,-.48,0.7);//i
 glVertex3f(1.52,-.44,0.7);//j
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.14,0.22,0.7);//l
 glVertex3f(0.76,.22,0.7);//m
 glVertex3f(.52,0.56,0.7);//n
 glVertex3f(-0.1,0.6,0.7);//0
 glVertex3f(-1.02,0.6,0.7);//p
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,-.28,0.7);//r
 glEnd();

glBegin(GL_LINE_LOOP);
 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,.14,-0.7);//k'
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(0.76,.22,-0.7);//m'
 glVertex3f(.52,0.56,-0.7);//n'
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(-1.02,0.6,-0.7);//p'
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,-0.7);//r'
 glEnd();

glBegin(GL_LINES);
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.42,-.2,0.7);//d
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-0.3,-.48,0.7);//e
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(.81,-0.48,0.7);//f
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.94,-0.2,0.7);//g
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(1.24,-.2,0.7);//h
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.38,-.48,0.7);//i
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.52,-.44,0.7);//j
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.52,.14,-0.7);//k'
 glVertex3f(1.14,0.22,0.7);//l
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(0.76,.22,0.7);//m
 glVertex3f(0.76,.22,-0.7);//m'
 glVertex3f(.52,0.56,0.7);//n
 glVertex3f(.52,0.56,-0.7);//n'
 glVertex3f(-0.1,0.6,0.7);//0
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(-1.02,0.6,0.7);//p
 glVertex3f(-1.02,0.6,-0.7);//p'
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,0.7);//r
 glVertex3f(-1.2,-.28,-0.7);//r'
glEnd();


// top filling
glBegin(GL_POLYGON);
 glVertex3f(-0.1,0.6,0.7);//o
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(-1.02,0.6,-0.7);//p'
 glVertex3f(-1.02,0.6,0.7);//p
glEnd();


glBegin(GL_POLYGON);
 glVertex3f(-0.1,0.6,0.7);//o
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(.52,0.56,-0.7);//n'
 glVertex3f(.52,0.56,0.7);//n
glEnd();

//back filling
glBegin(GL_POLYGON);
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,-0.7);//r'
 glVertex3f(-1.2,-.28,0.7);//r
glEnd();





glBegin(GL_POLYGON);
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.14,0.22,0.7);//l
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(1.52,.14,-0.7);//k'
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(0.76,.22,0.7);//m
 glVertex3f(0.76,.22,-0.7);//m'
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(1.14,0.22,0.7);//l
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-0.64,0.22,0.7);//cc
 glVertex3f(-1.08,0.22,0.7);//dd
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,-.28,0.7);//r
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-.74,-0.2,0.7);//c
glVertex3f(-0.64,0.22,0.7);//cc
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(-0.5,-0.2,0.7);//pp
glEnd();
glBegin(GL_POLYGON);
glVertex3f(0.0,0.22,0.7);//gg
glVertex3f(1.14,0.22,0.7);//l
glVertex3f(1.24,-.2,0.7);//h
glVertex3f(0.0,-0.2,0.7);//oo



glEnd();
//
glBegin(GL_POLYGON);

 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-0.64,0.22,-0.7);//cc'
 glVertex3f(-1.08,0.22,-0.7);//dd'
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,-0.7);//r'
glEnd();

glBegin(GL_POLYGON);

glVertex3f(-.74,-0.2,-0.7);//c'
```

```
glVertex3f(-0.64,0.22,-0.7);//cc'
glVertex3f(-0.5,0.22,-0.7);//hh'
glVertex3f(-0.5,-0.2,-0.7);//pp'

glEnd();
glBegin(GL_POLYGON);
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(1.14,0.22,-0.7);//l'
glVertex3f(1.24,-.2,-0.7);//h'
glVertex3f(0.0,-0.2,-0.7);//oo'

glEnd();


glBegin(GL_POLYGON);
glVertex3f(-1.2,0.22,0.7);//q
glVertex3f(-1.08,0.22,0.7);//dd
glVertex3f(-0.98,0.5,0.7);//aa
glVertex3f(-1.02,0.6,0.7);//p
glEnd();


glBegin(GL_POLYGON);
glVertex3f(-1.02,0.6,0.7);//p
glVertex3f(-0.98,0.5,0.7);//aa
glVertex3f(0.44,0.5,0.7);//jj
glVertex3f(.52,0.56,0.7);//n
glVertex3f(-0.1,0.6,0.7);//0
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-0.64,0.5,0.7);//bb
glVertex3f(-0.64,0.22,0.7);//cc
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(-0.5,0.5,0.7);//ee
glEnd();

glBegin(GL_POLYGON);
glVertex3f(0.0,0.5,0.7);//ff
glVertex3f(0.0,0.22,0.7);//gg
glVertex3f(0.12,0.22,0.7);//ll
glVertex3f(0.12,0.5,0.7);//ii
glEnd();

glBegin(GL_POLYGON);
glVertex3f(.52,0.56,0.7);//n
glVertex3f(0.44,0.5,0.7);//jj
glVertex3f(0.62,0.22,0.7);//kk
glVertex3f(0.76,.22,0.7);//m
glEnd();
```

```
glBegin(GL_POLYGON);
glVertex3f(-.42,-.2,0.7);//d
glVertex3f(.94,-0.2,0.7);//g
glVertex3f(.81,-0.48,0.7);//f
glVertex3f(-0.3,-.48,0.7);//e
glEnd();

glBegin(GL_POLYGON);
glVertex3f(1.14,0.22,0.7);//l
glVertex3f(1.52,.14,0.7);//k
glVertex3f(1.52,-.44,0.7);//j
glVertex3f(1.38,-.48,0.7);//i
glVertex3f(1.24,-.2,0.7);//h
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-1.2,0.22,-0.7);//q'
glVertex3f(-1.08,0.22,-0.7);//dd'
glVertex3f(-0.98,0.5,-0.7);//aa'
glVertex3f(-1.02,0.6,-0.7);//p'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-1.02,0.6,-0.7);//p'
glVertex3f(-0.98,0.5,-0.7);//aa'
glVertex3f(0.44,0.5,-0.7);//jj'
glVertex3f(.52,0.56,-0.7);//n'
glVertex3f(-0.1,0.6,-0.7);//0'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-0.64,0.5,-0.7);//bb'
glVertex3f(-0.64,0.22,-0.7);//cc'
glVertex3f(-0.5,0.22,-0.7);//hh'
glVertex3f(-0.5,0.5,-0.7);//ee'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(0.0,0.5,-0.7);//ff'
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(0.12,0.22,-0.7);//ll'
glVertex3f(0.12,0.5,-0.7);//ii'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(.52,0.56,-0.7);//n'
glVertex3f(0.44,0.5,-0.7);//jj'
glVertex3f(0.62,0.22,-0.7);//kk'
glVertex3f(0.76,.22,-0.7);//m'
```

```
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-.42,-.2,-0.7);//d'
glVertex3f(.94,-0.2,-0.7);//g'
glVertex3f(.81,-0.48,-0.7);//f'
glVertex3f(-0.3,-.48,-0.7);//e'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(1.14,0.22,-0.7);//l'
glVertex3f(1.52,.14,-0.7);//k'
glVertex3f(1.52,-.44,-0.7);//j'
glVertex3f(1.38,-.48,-0.7);//i'
glVertex3f(1.24,-.2,-0.7);//h'
glEnd();


// door1 body- rear, near
glBegin(GL_POLYGON);
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(0.0,0.22,0.7);//gg
glVertex3f(0.0,-0.2,0.7);//oo
glVertex3f(-0.5,-0.2,0.7);//pp
glEnd();

// door body- rear, far
glBegin(GL_POLYGON);
glVertex3f(-0.5,0.22,-0.7);//hh'
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(0.0,-0.2,-0.7);//oo'
glVertex3f(-0.5,-0.2,-0.7);//pp'
glEnd();

// door2  body- near, driver

glBegin(GL_POLYGON);
glVertex3f(0.12,0.22,0.7);//ll
glVertex3f(0.62,0.22,0.7);//kk
glVertex3f(0.62,-0.2,0.7);//mm
glVertex3f(0.12,-0.2,0.7);//nn
glEnd();



// door2  body- far, driver

glBegin(GL_POLYGON);
 glVertex3f(0.12,0.22,-0.7);//ll'
glVertex3f(0.62,0.22,-0.7);//kk'
```

```
glVertex3f(0.62,-0.2,-0.7);//mm'
glVertex3f(0.12,-0.2,-0.7);//nn'
glEnd();

glBegin(GL_POLYGON);//front**
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.52,.14,-0.7);//k'
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,-.44,0.7);//j
glEnd();

glTranslatef(-.58,-.52,0.7);//translate to 1st tyre
glColor3f(0.09,0.09,0.09);// tyre color********
glutSolidTorus(0.12f, .14f, 10, 25);
glTranslatef(1.68,0.0,0.0);//translate to 2nd tyre
glutSolidTorus(0.12f, .14f, 10, 25);

glTranslatef(0.0,0.0,-1.4);//translate to 3rd tyre
glutSolidTorus(0.12f, .14f, 10, 25);
glTranslatef(-1.68,0.0,0.0);//translate to 4th tyre which is
behind 1st tyre i.e rear .back
glutSolidTorus(0.12f, .14f, 10, 25);
glTranslatef(.58,.52,0.7);//translate to origin
glRotatef(90.0,0.0,1.0,0.0);
glTranslatef(0.0,0.0,-1.40);

glutSolidTorus(0.2f, .2f, 10, 25);

glTranslatef(0.0,0.0,1.40);
glRotatef(270.0,0.0,1.0,0.0);


//bottom filling
glBegin(GL_POLYGON);
glColor3f(0.25,0.25,0.25);
 glVertex3f(-0.3,-.48,0.7);//e
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.81,-0.48,0.7);//f
glEnd();




glBegin(GL_POLYGON);
 glVertex3f(-.42,-.2,0.7);//d
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(-0.3,-.48,0.7);//e
glEnd();
```

```
glBegin(GL_POLYGON);

glVertex3f(-1.2,-.28,0.7);//r
glVertex3f(-1.2,-.28,-0.7);//r'
glVertex3f(-1.12,-.48,-0.7);//a'
glVertex3f(-1.12,-.48,0.7);//a

glEnd();

glBegin(GL_POLYGON);
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-0.86,-.48,0.7);//b
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.74,-0.2,0.7);//c
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-.42,-.2,0.7);//d
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(.81,-0.48,0.7);//f
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(.94,-0.2,0.7);//g
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(.94,-0.2,0.7);//g
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.24,-.2,0.7);//h
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(1.24,-.2,0.7);//h
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.38,-.48,0.7);//i
```

```
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(1.38,-.48,0.7);//i
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,-.44,0.7);//j
glEnd();



//*********************************************************
**********************************8


// door outline- rear, front
glBegin(GL_LINE_LOOP);
glColor3f(1.0,1.0,1.0);
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(0.0,0.22,0.7);//gg
glVertex3f(0.0,-0.2,0.7);//oo
glVertex3f(-0.5,-0.2,0.7);//pp


glEnd();



// door2 outline- near, driver

glBegin(GL_LINE_LOOP);

glVertex3f(0.12,0.22,0.7);//ll
glVertex3f(0.62,0.22,0.7);//kk
glVertex3f(0.62,-0.2,0.7);//mm
glVertex3f(0.12,-0.2,0.7);//nn
glEnd();


glColor3f(0.0,0.0,0.0);
// door2  outline- far, driver

glBegin(GL_LINE_LOOP);

glVertex3f(0.12,0.22,-0.7);//ll'
glVertex3f(0.62,0.22,-0.7);//kk'
glVertex3f(0.62,-0.2,-0.7);//mm'
glVertex3f(0.12,-0.2,-0.7);//nn'
glEnd();
```

```
// door outline- rear, far
glBegin(GL_LINE_LOOP);

glVertex3f(-0.5,0.22,-0.7);//hh'
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(0.0,-0.2,-0.7);//oo'
glVertex3f(-0.5,-0.2,-0.7);//pp'


glEnd();
glBegin(GL_POLYGON);//front**
glVertex3f(1.52,.14,0.7);//k
glVertex3f(1.52,.14,-0.7);//k'
glVertex3f(1.52,-.44,-0.7);//j'
glVertex3f(1.52,-.44,0.7);//j

glEnd();

glColor3f(0.0,0.0,1.0);

// transparent objects are placed next ..

 glBlendFunc(GL_SRC_ALPHA,
GL_ONE_MINUS_SRC_ALPHA);//TRANCPARENCY3

//windscreen
 glBegin(GL_POLYGON);
glColor4f(0.0,0.0,0.0,0.7);   //COLOR =WHITE TRANSPARENT
 glVertex3f(0.562,.5,.6);//AAA
 glVertex3f(.562,.5,-.6);//AAA'
 glVertex3f(.76,.22,-.6);//MMM'
 glVertex3f(.76,.22,.6);//MMM

glEnd();
//rear window
glBegin(GL_POLYGON);
   //COLOR =WHITE TRANSPARENT

 glVertex3f(-1.068,0.5,0.6);//pp
 glVertex3f(-1.068,0.5,-0.6);//pp'
 glVertex3f(-1.2,0.22,-0.6);//qq'
 glVertex3f(-1.2,0.22,0.6);//qq

glEnd();
//leftmost window front
glBegin(GL_POLYGON);
 glVertex3f(-0.98,0.5,0.7);//aa
 glVertex3f(-0.64,0.5,0.7);//bb
 glVertex3f(-0.64,0.22,0.7);//cc
 glVertex3f(-1.08,0.22,0.7);//dd
glEnd();

//leftmost window back
glBegin(GL_POLYGON);

 glVertex3f(-0.98,0.5,-0.7);//aa
 glVertex3f(-0.64,0.5,-0.7);//bb
 glVertex3f(-0.64,0.22,-0.7);//cc
 glVertex3f(-1.08,0.22,-0.7);//dd
glEnd();

//middle window front

glBegin(GL_POLYGON);

glVertex3f(-0.5,0.5,0.7);
glVertex3f(0.0,0.5,0.7);
glVertex3f(0.0,0.22,0.7);
glVertex3f(-0.5,0.22,0.7);

glEnd();




//middle window back

glBegin(GL_POLYGON);

glVertex3f(-0.5,0.5,-0.7);
glVertex3f(0.0,0.5,-0.7);
glVertex3f(0.0,0.22,-0.7);
glVertex3f(-0.5,0.22,-0.7);

glEnd();
//rightmost window front

glBegin(GL_POLYGON);

glVertex3f(0.12,0.5,0.7);//ii
glVertex3f(0.44,0.5,0.7);//jj
glVertex3f(0.62,0.22,0.7);//kk
glVertex3f(0.12,0.22,0.7);//ll


glEnd();


//rightmost window back
```

```
glBegin(GL_POLYGON);

glVertex3f(0.12,0.5,-0.7);//ii'
glVertex3f(0.44,0.5,-0.7);//jj'
glVertex3f(0.62,0.22,-0.7);//kk'
glVertex3f(0.12,0.22,-0.7);//ll'


glEnd();


////car code ends here
glColor3f(0.0,0.0,1.0);

}
```

Source code di atas menjelaskan bahwa dalam pembuatan mobil, kami membuat garis berulang, garis, polygon untuk membuat sebuah mobil dengan jumlah yang bisa ditentukan.

- Rumah

  Dalam pembuatan rumah, kami gunakan source code sebagai berikut:

```
void drawhouse()
{
 glBegin(GL_LINE_LOOP);

    glVertex3f(-2.6,-.84,2.5);//m
    glVertex3f(-2.6,0.84,2.5);//n
    glVertex3f(-3.04,0.84,2.8);//o
    glVertex3f(0,1.95,2.8);//p
    glVertex3f(3.04,0.84,2.8);//w
    glVertex3f(2.6,0.84,2.5);//q
    glVertex3f(2.6,-0.84,2.5);//r
       glVertex3f(1.59,-0.84,2.5);//s
    glVertex3f(1.59,0.16,2.5);//t
    glVertex3f(-1.59,0.16,2.5);//u
    glVertex3f(-1.59,-0.84,2.5);//v
    glEnd();
    glBegin(GL_LINES);
    glVertex3f(1.59,-0.84,2.5);//s
       glVertex3f(-1.59,-0.84,2.5);//v
    glEnd();

    glBegin(GL_LINE_LOOP);
       glVertex3f(-2.6,-.84,-2.5);//m'
    glVertex3f(-2.6,0.84,-2.5);//n'
    glVertex3f(-3.04,0.84,-2.8);//o'
    glVertex3f(0,1.95,-2.8);//p'
```

```
  glVertex3f(3.04,0.84,-2.8);//w'
  glVertex3f(2.6,0.84,-2.5);//q'
  glVertex3f(2.6,-0.84,-2.5);//r'
     glVertex3f(1.59,-0.84,-2.5);//s'
  glVertex3f(1.59,0.16,-2.5);//t'
  glVertex3f(-1.59,0.16,-2.5);//u'
  glVertex3f(-1.59,-0.84,-2.5);//v'
     glEnd();

     glBegin(GL_LINES);
     glVertex3f(-2.6,-.84,2.5);//m
   glVertex3f(-2.6,-.84,-2.5);//m'
      glVertex3f(-2.6,0.84,2.5);//n
glVertex3f(-2.6,0.84,-2.5);//n'
       glVertex3f(-3.04,0.84,2.8);//o
 glVertex3f(-3.04,0.84,-2.8);//o'
 glVertex3f(0,1.95,2.8);//p
  glVertex3f(0,1.95,-2.8);//p'

  glVertex3f(3.04,0.84,2.8);//w
     glVertex3f(3.04,0.84,-2.8);//w'
  glVertex3f(2.6,0.84,2.5);//q
  glVertex3f(2.6,0.84,-2.5);//q'
  glVertex3f(2.6,-0.84,2.5);//r
  glVertex3f(2.6,-0.84,-2.5);//r'
     glVertex3f(1.59,-0.84,2.5);//s
     glVertex3f(1.59,-0.84,-2.5);//s'

  glVertex3f(-1.59,-0.84,2.5);//v
     glVertex3f(-1.59,-0.84,-2.5);//v'


  glEnd();
  glColor3ub(255,185,1);//*************

  glBegin(GL_QUADS);
      glVertex3f(-2.6,-.84,2.5);//m
glVertex3f(-2.6,0.16,2.5);//uu
glVertex3f(-1.59,0.16,2.5);//u
glVertex3f(-1.59,-0.84,2.5);//v

     glVertex3f(-2.6,0.16,2.5);//uu
     glVertex3f(-2.6,0.84,2.5);//n
   glVertex3f(2.6,0.84,2.5);//q
glVertex3f(2.6,0.16,2.5);//tt


   glVertex3f(1.59,-0.84,2.5);//s
  glVertex3f(1.59,0.16,2.5);//t
      glVertex3f(2.6,0.16,2.5);//tt
```

```
    glVertex3f(2.6,-0.84,2.5);//r


         glVertex3f(-2.6,-.84,-2.5);//m'
   glVertex3f(-2.6,0.16,-2.5);//uu'
   glVertex3f(-1.59,0.16,-2.5);//u'
   glVertex3f(-1.59,-0.84,-2.5);//v'

        glVertex3f(-2.6,0.16,-2.5);//uu'
        glVertex3f(-2.6,0.84,-2.5);//n'
      glVertex3f(2.6,0.84,-2.5);//q'
   glVertex3f(2.6,0.16,-2.5);//tt'


      glVertex3f(1.59,-0.84,-2.5);//s'
     glVertex3f(1.59,0.16,-2.5);//t'
         glVertex3f(2.6,0.16,-2.5);//tt'
    glVertex3f(2.6,-0.84,-2.5);//r'

    glVertex3f(-2.6,-.84,2.5);//m
      glVertex3f(-2.6,-.84,-2.5);//m'
         glVertex3f(-2.6,0.84,-2.5);//n'
   glVertex3f(-2.6,0.84,2.5);//n

   glVertex3f(2.6,0.84,2.5);//q
     glVertex3f(2.6,0.84,-2.5);//q'
     glVertex3f(2.6,-0.84,-2.5);//r'
     glVertex3f(2.6,-0.84,2.5);//r

     glEnd();




    glBegin(GL_TRIANGLES);
glVertex3f(0,1.95,2.5);//p
      glVertex3f(3.04,0.84,2.5);//w
         glVertex3f(-3.04,0.84,2.5);//o
   glVertex3f(0,1.95,-2.5);//p'
      glVertex3f(3.04,0.84,-2.5);//w'
         glVertex3f(-3.04,0.84,-2.5);//o'

glEnd();
  glColor3ub(255,102,0);//***********top color

    glBegin(GL_QUADS);

     glVertex3f(0,1.95,2.8);//p
    glVertex3f(0,1.95,-2.8);//p'
```

```
                glVertex3f(3.04,0.84,-2.8);//w'
                glVertex3f(3.04,0.84,2.8);//w

              glVertex3f(-3.04,0.84,2.8);//o
            glVertex3f(-3.04,0.84,-2.8);//o'
            glVertex3f(0,1.95,-2.8);//p'
             glVertex3f(0,1.95,2.8);//p

                   glEnd();

              glColor3ub(116,18,0);//*******base color

             glBegin(GL_QUADS);
             glVertex3f(-2.6,-.84,2.5);//m
                   glVertex3f(2.6,-0.84,2.5);//r
             glVertex3f(2.6,-0.84,-2.5);//r'
             glVertex3f(-2.6,-.84,-2.5);//m'
             glEnd();



        }
```

2.3 Animasi

Dalam pembuatan animasi pada mobil dan rumah, kami menggunakan GL_QUADS dan GL_TRIANGELS

2.4 Pencahayaan

Pencahayaan disini kami menggunakan source code sebagai berikut yang dimana untuk membuat pencahayaan pada mobil dan rumah yang kami buat, seperti berikut:

```
GLuint createDL() {

 GLuint carrDL;


 // Create the id for the list

 carrDL = glGenLists(1);


 // start list

 glNewList(carrDL,GL_COMPILE);


 // call the function that contains the rendering commands

  drawcarr();
 // endList
 glEndList();

 return(carrDL);
}
GLuint createDL2()//******************
{
 GLuint houseDL;

 // Create the id for the list
 houseDL = glGenLists(1);

 // start list
 glNewList(houseDL,GL_COMPILE);

 // call the function that contains the rendering commands
  drawhouse();

 // endList
 glEndList();

 return(houseDL);
}//**************

void initScene()
{

 glEnable(GL_DEPTH_TEST);
 carr_display_list = createDL();
 house_display_list= createDL2();//***********
```

```
}
```

2.5 Texture

Kami menggunakan Transparency mapping untuk mengatur intensitas cahaya permukaan tembus pandang.

Pemetaan Transparansi adalah metode lain menggunakan Bitmap untuk membuat bahan. Perbedaannya adalah bahwa ini adalah menggunakan alpha channel untuk menyingkirkan bagian yang tidak diinginkan dari Bitmap, hanya menyimpan bagian yang tertutup oleh alpha channel. Ini disebut topeng.

2.6 Pembagian Pekerjaan

- Sandi
  Membuat renderScene “void renderScene(void)”

- I Putu Denny Indra Putra
  Membuat rumah “void drawhouse()”

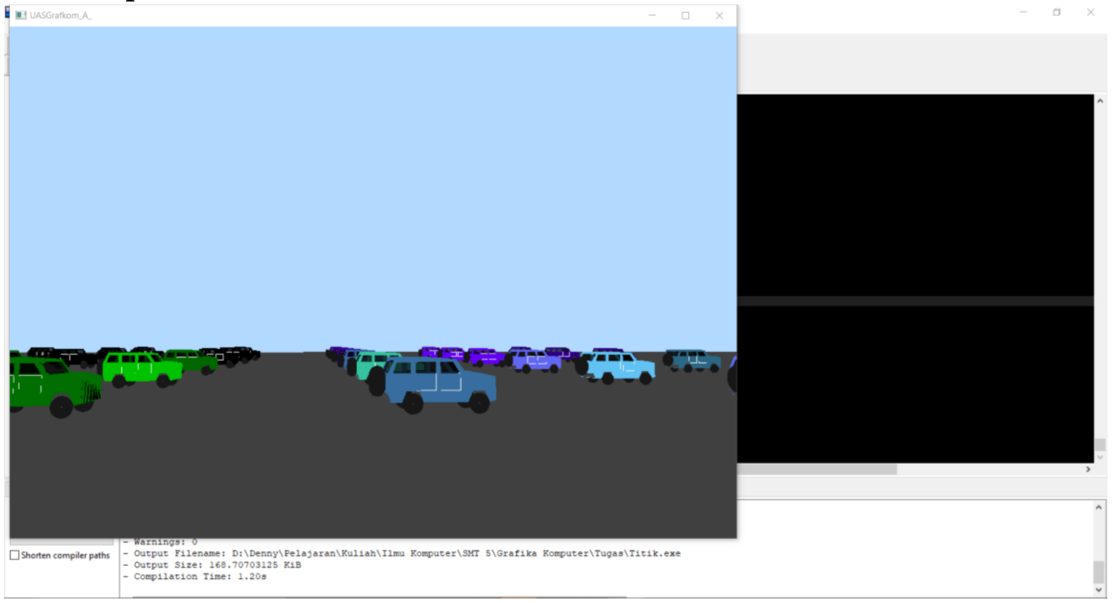
- I Gede Teguh Satya Dharma
  Membuat pergerakan mobil “void movecar(int key, int x, int y)”

- Yuriko Christian
  Membuat mobil “void drawcarr()”

- Gede Agus Surya Atmaja
  Membuat proses menu dan menu “void menu() dan void Processmenu1()”

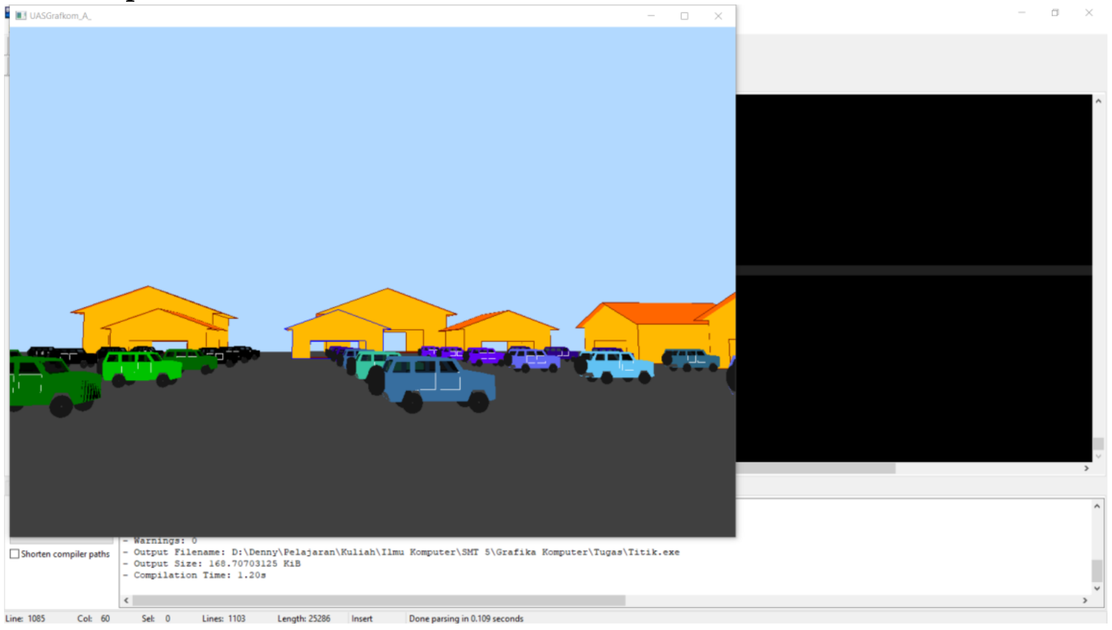
BAB III
HASIL DAN PEMBAHASAN

3.1 Tampilan Awal



```
- Warnings: 0
- Output Filename: D:\Denny\Pelajaran\Kuliah\Ilmu Komputer\SMT 5\Grafika Komputer\Tugas\Titik.exe
- Output Size: 168.70703125 KiB
- Compilation Time: 1.20s
```

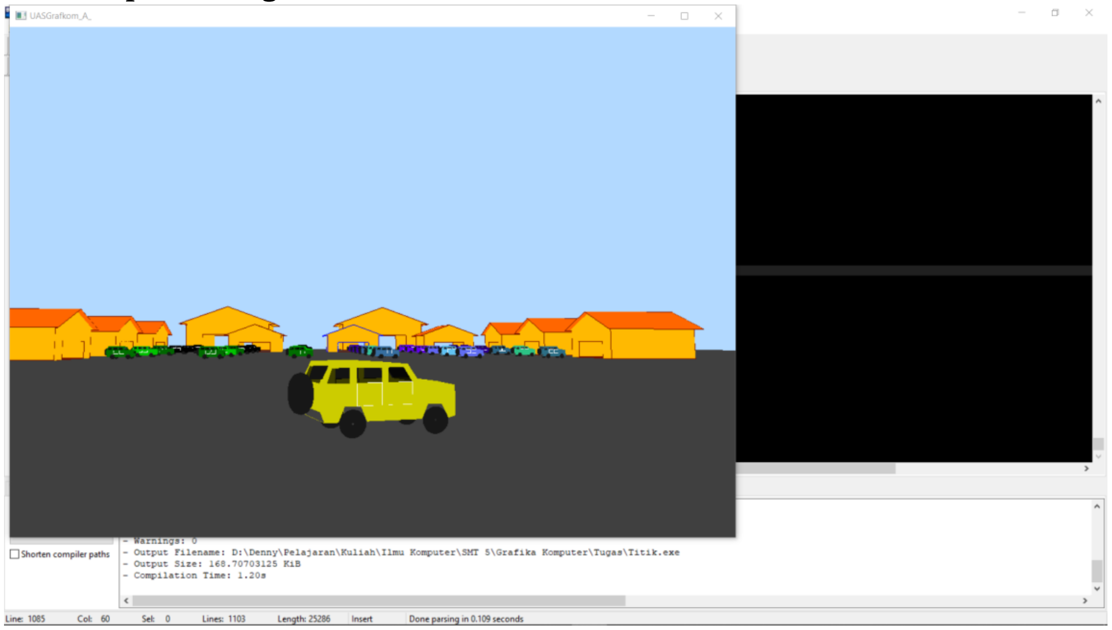
3.2 Tampilan Kedua



```
- Warnings: 0
- Output Filename: D:\Denny\Pelajaran\Kuliah\Ilmu Komputer\SMT 5\Grafika Komputer\Tugas\Titik.exe
- Output Size: 168.70703125 KiB
- Compilation Time: 1.20s
```

Line: 1085 Col: 60 Sel: 0 Lines: 1103 Length: 25286 Insert Done parsing in 0.109 seconds

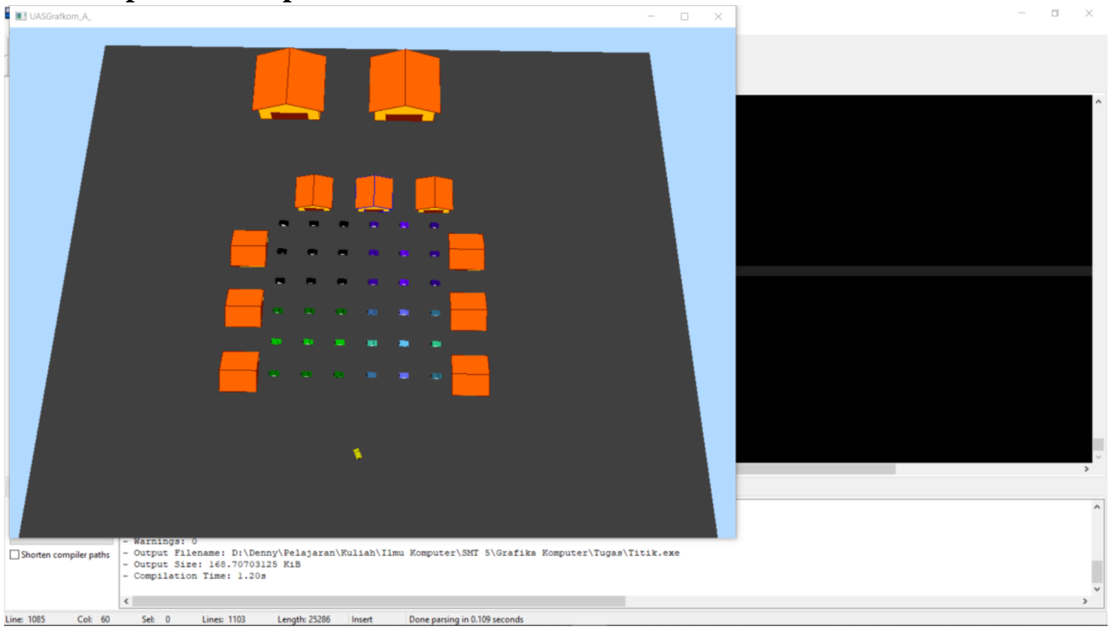
3.3 Tampilan Ketiga



```
- Warnings: 0
- Output Filename: D:\Denny\Pelajaran\Kuliah\Ilmu Komputer\SMT 5\Grafika Komputer\Tugas\Titik.exe
- Output Size: 168.70703125 KiB
- Compilation Time: 1.20s
```

```
Line: 1085    Col: 60    Sel: 0    Lines: 1103    Length: 25286    Insert    Done parsing in 0.109 seconds
```

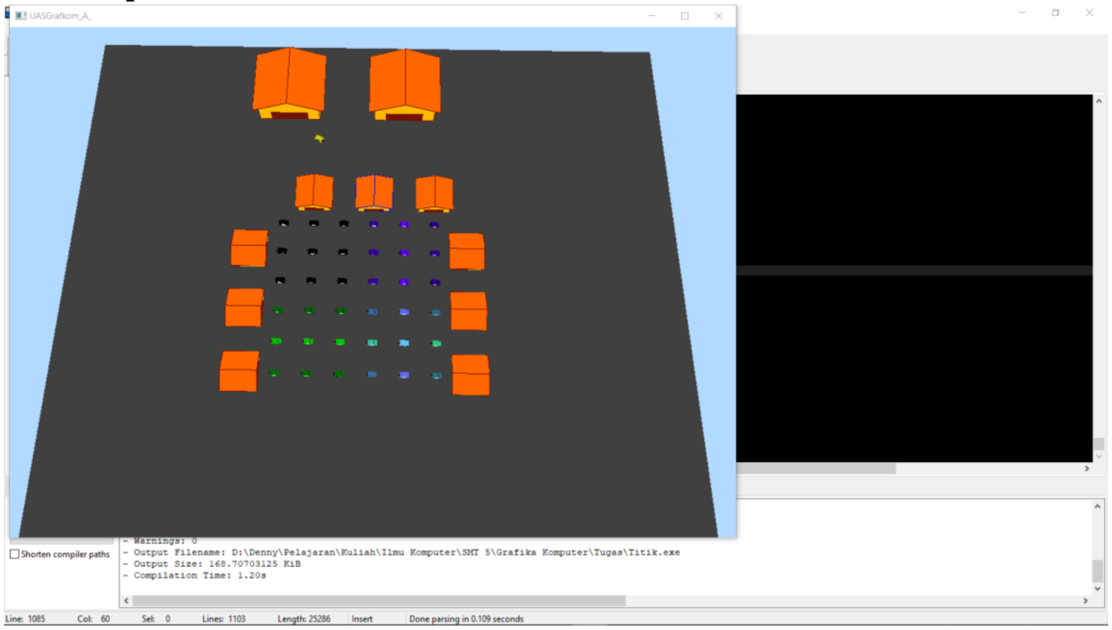
3.4 Tampilan Keempat



```
- Warnings: 0
- Output Filename: D:\Denny\Pelajaran\Kuliah\Ilmu Komputer\SMT 5\Grafika Komputer\Tugas\Titik.exe
- Output Size: 168.70703125 KiB
- Compilation Time: 1.20s
```

```
Line: 1085    Col: 60    Sel: 0    Lines: 1103    Length: 25286    Insert    Done parsing in 0.109 seconds
```

3.5 Tampilan Kelima



```
- Warnings: 0
- Output Filename: D:\Denny\Pelajaran\Kuliah\Ilmu Komputer\SMT 5\Grafika Komputer\Tugas\Titik.exe
- Output Size: 168.70703125 KiB
- Compilation Time: 1.20s
```

```
Line: 1085   Col: 60   Sel: 0   Lines: 1103   Length: 25286   Insert   Done parsing in 0.109 seconds
```

LAMPIRAN SCRIPT CODE

```
#include <GL/glut.h>

#include <math.h>

#include <stdlib.h>


static float angle=0.0,ratio;

static float x=0.0f,y=1.75f,z=5.0f;

static float lx=0.10f,ly=0.10f,lz=-1.0f;

static GLint carr_display_list,house_display_list;

float theta=0.01,fxincr=0.1,fzincr=0,temp,theta1,fx=-10,fz=80;

int xxxx=0,yyyy=0,kk=0,housevisible=0,movecarvar=0;

int
a[36]={55,97,44,152,55,171,108,86,168,99,147,207,238,55,233,167,105,
80,134,29,253,130,32,240,110,199,224,121,93,199,180,61,110,251,77,23
7};

int
b[36]={102,194,110,152,153,184,137,113,55,138,104,43,240,255,203,8,1
00,53,88,64,127,64,87,5,2,144,211,128,10,89,27,11,175,185,157,241};

int
c[36]={159,243,133,253,233,228,141,18,46,195,75,52,253,204,169,30,78
,94,68,117,4,2,33,12,2,25,195,76,26,54,98,103,205,173,65,242};



void changeSize(int w, int h)

{


 // Prevent a divide by zero, when window is too short

 // (you cant make a window of zero width).

if(h == 0)

h = 1;

ratio = 1.0f * w / h;
```

```
 // Reset the coordinate system before modifying
glMatrixMode(GL_PROJECTION);
glLoadIdentity();

 // Set the viewport to be the entire window
    glViewport(0, 0, w, h);

 // Set the clipping volume
 gluPerspective(45,ratio,1,1000);
 glMatrixMode(GL_MODELVIEW);
 glLoadIdentity();
 gluLookAt(x, y, z,
        x + lx,y + ly,z + lz,
     0.0f,1.0f,0.0f);



 }



void drawcarr()
{

glTranslatef(.0,0.8,0.0);
glEnable(GL_BLEND);//TRANCPARENCY1
  glBlendFunc(GL_ONE, GL_ZERO);//TRANCPARENCY2
   //glColor3f(1.0,1.0,1.0);
  // glBegin(
   //glVertex3f(

glBegin(GL_LINE_LOOP);
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-.42,-.2,0.7);//d
 glVertex3f(-0.3,-.48,0.7);//e
 glVertex3f(.81,-0.48,0.7);//f
 glVertex3f(.94,-0.2,0.7);//g
 glVertex3f(1.24,-.2,0.7);//h
 glVertex3f(1.38,-.48,0.7);//i
 glVertex3f(1.52,-.44,0.7);//j
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.14,0.22,0.7);//l
 glVertex3f(0.76,.22,0.7);//m
 glVertex3f(.52,0.56,0.7);//n
 glVertex3f(-0.1,0.6,0.7);//0
 glVertex3f(-1.02,0.6,0.7);//p
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,-.28,0.7);//r
 glEnd();

glBegin(GL_LINE_LOOP);
 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,.14,-0.7);//k'
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(0.76,.22,-0.7);//m'
 glVertex3f(.52,0.56,-0.7);//n'
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(-1.02,0.6,-0.7);//p'
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,-0.7);//r'
 glEnd();

glBegin(GL_LINES);
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.42,-.2,0.7);//d
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-0.3,-.48,0.7);//e
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(.81,-0.48,0.7);//f
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.94,-0.2,0.7);//g
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(1.24,-.2,0.7);//h
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.38,-.48,0.7);//i
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.52,-.44,0.7);//j
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.52,.14,-0.7);//k'
 glVertex3f(1.14,0.22,0.7);//l
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(0.76,.22,0.7);//m
 glVertex3f(0.76,.22,-0.7);//m'
 glVertex3f(.52,0.56,0.7);//n
 glVertex3f(.52,0.56,-0.7);//n'
 glVertex3f(-0.1,0.6,0.7);//0
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(-1.02,0.6,0.7);//p
 glVertex3f(-1.02,0.6,-0.7);//p'
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,0.7);//r
 glVertex3f(-1.2,-.28,-0.7);//r'
glEnd();


// top filling
glBegin(GL_POLYGON);
 glVertex3f(-0.1,0.6,0.7);//o
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(-1.02,0.6,-0.7);//p'
 glVertex3f(-1.02,0.6,0.7);//p
glEnd();


glBegin(GL_POLYGON);
 glVertex3f(-0.1,0.6,0.7);//o
 glVertex3f(-0.1,0.6,-0.7);//o'
 glVertex3f(.52,0.56,-0.7);//n'
 glVertex3f(.52,0.56,0.7);//n
glEnd();

//back filling
glBegin(GL_POLYGON);
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,-0.7);//r'
 glVertex3f(-1.2,-.28,0.7);//r
glEnd();







glBegin(GL_POLYGON);
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.14,0.22,0.7);//l
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(1.52,.14,-0.7);//k'
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(0.76,.22,0.7);//m
 glVertex3f(0.76,.22,-0.7);//m'
 glVertex3f(1.14,0.22,-0.7);//l'
 glVertex3f(1.14,0.22,0.7);//l
glEnd();

glBegin(GL_POLYGON);
```

```
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-0.64,0.22,0.7);//cc
 glVertex3f(-1.08,0.22,0.7);//dd
 glVertex3f(-1.2,0.22,0.7);//q
 glVertex3f(-1.2,-.28,0.7);//r
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-.74,-0.2,0.7);//c
glVertex3f(-0.64,0.22,0.7);//cc
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(-0.5,-0.2,0.7);//pp
glEnd();
glBegin(GL_POLYGON);
glVertex3f(0.0,0.22,0.7);//gg
glVertex3f(1.14,0.22,0.7);//l
glVertex3f(1.24,-.2,0.7);//h
glVertex3f(0.0,-0.2,0.7);//oo



glEnd();
//
glBegin(GL_POLYGON);

 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-0.64,0.22,-0.7);//cc'
 glVertex3f(-1.08,0.22,-0.7);//dd'
 glVertex3f(-1.2,0.22,-0.7);//q'
 glVertex3f(-1.2,-.28,-0.7);//r'
glEnd();

glBegin(GL_POLYGON);

glVertex3f(-.74,-0.2,-0.7);//c'
glVertex3f(-0.64,0.22,-0.7);//cc'
glVertex3f(-0.5,0.22,-0.7);//hh'
glVertex3f(-0.5,-0.2,-0.7);//pp'

glEnd();
glBegin(GL_POLYGON);
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(1.14,0.22,-0.7);//l'
glVertex3f(1.24,-.2,-0.7);//h'
glVertex3f(0.0,-0.2,-0.7);//oo'

glEnd();



glBegin(GL_POLYGON);
glVertex3f(-1.2,0.22,0.7);//q
glVertex3f(-1.08,0.22,0.7);//dd
glVertex3f(-0.98,0.5,0.7);//aa
glVertex3f(-1.02,0.6,0.7);//p
glEnd();



glBegin(GL_POLYGON);
```

```
glVertex3f(-1.02,0.6,0.7);//p
glVertex3f(-0.98,0.5,0.7);//aa
glVertex3f(0.44,0.5,0.7);//jj
glVertex3f(.52,0.56,0.7);//n
glVertex3f(-0.1,0.6,0.7);//0
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-0.64,0.5,0.7);//bb
glVertex3f(-0.64,0.22,0.7);//cc
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(-0.5,0.5,0.7);//ee
glEnd();

glBegin(GL_POLYGON);
glVertex3f(0.0,0.5,0.7);//ff
glVertex3f(0.0,0.22,0.7);//gg
glVertex3f(0.12,0.22,0.7);//ll
glVertex3f(0.12,0.5,0.7);//ii
glEnd();

glBegin(GL_POLYGON);
glVertex3f(.52,0.56,0.7);//n
glVertex3f(0.44,0.5,0.7);//jj
glVertex3f(0.62,0.22,0.7);//kk
glVertex3f(0.76,.22,0.7);//m
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-.42,-.2,0.7);//d
glVertex3f(.94,-0.2,0.7);//g
```

```
glVertex3f(.81,-0.48,0.7);//f
glVertex3f(-0.3,-.48,0.7);//e
glEnd();

glBegin(GL_POLYGON);
glVertex3f(1.14,0.22,0.7);//l
glVertex3f(1.52,.14,0.7);//k
glVertex3f(1.52,-.44,0.7);//j
glVertex3f(1.38,-.48,0.7);//i
glVertex3f(1.24,-.2,0.7);//h
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-1.2,0.22,-0.7);//q'
glVertex3f(-1.08,0.22,-0.7);//dd'
glVertex3f(-0.98,0.5,-0.7);//aa'
glVertex3f(-1.02,0.6,-0.7);//p'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-1.02,0.6,-0.7);//p'
glVertex3f(-0.98,0.5,-0.7);//aa'
glVertex3f(0.44,0.5,-0.7);//jj'
glVertex3f(.52,0.56,-0.7);//n'
glVertex3f(-0.1,0.6,-0.7);//0'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-0.64,0.5,-0.7);//bb'
glVertex3f(-0.64,0.22,-0.7);//cc'
glVertex3f(-0.5,0.22,-0.7);//hh'
```

```
glVertex3f(-0.5,0.5,-0.7);//ee'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(0.0,0.5,-0.7);//ff'
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(0.12,0.22,-0.7);//ll'
glVertex3f(0.12,0.5,-0.7);//ii'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(.52,0.56,-0.7);//n'
glVertex3f(0.44,0.5,-0.7);//jj'
glVertex3f(0.62,0.22,-0.7);//kk'
glVertex3f(0.76,.22,-0.7);//m'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(-.42,-.2,-0.7);//d'
glVertex3f(.94,-0.2,-0.7);//g'
glVertex3f(.81,-0.48,-0.7);//f'
glVertex3f(-0.3,-.48,-0.7);//e'
glEnd();

glBegin(GL_POLYGON);
glVertex3f(1.14,0.22,-0.7);//l'
glVertex3f(1.52,.14,-0.7);//k'
glVertex3f(1.52,-.44,-0.7);//j'
glVertex3f(1.38,-.48,-0.7);//i'
glVertex3f(1.24,-.2,-0.7);//h'
glEnd();
```

```
// door1 body- rear, near
glBegin(GL_POLYGON);
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(0.0,0.22,0.7);//gg
glVertex3f(0.0,-0.2,0.7);//oo
glVertex3f(-0.5,-0.2,0.7);//pp
glEnd();

// door body- rear, far
glBegin(GL_POLYGON);
glVertex3f(-0.5,0.22,-0.7);//hh'
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(0.0,-0.2,-0.7);//oo'
glVertex3f(-0.5,-0.2,-0.7);//pp'
glEnd();

// door2  body- near, driver

glBegin(GL_POLYGON);
glVertex3f(0.12,0.22,0.7);//ll
glVertex3f(0.62,0.22,0.7);//kk
glVertex3f(0.62,-0.2,0.7);//mm
glVertex3f(0.12,-0.2,0.7);//nn
glEnd();



// door2  body- far, driver
```

```
glBegin(GL_POLYGON);
 glVertex3f(0.12,0.22,-0.7);//ll'
glVertex3f(0.62,0.22,-0.7);//kk'
glVertex3f(0.62,-0.2,-0.7);//mm'
glVertex3f(0.12,-0.2,-0.7);//nn'
glEnd();

glBegin(GL_POLYGON);//front**
 glVertex3f(1.52,.14,0.7);//k
 glVertex3f(1.52,.14,-0.7);//k'
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,-.44,0.7);//j
glEnd();

glTranslatef(-.58,-.52,0.7);//translate to 1st tyre
glColor3f(0.09,0.09,0.09);// tyre color********
glutSolidTorus(0.12f, .14f, 10, 25);
glTranslatef(1.68,0.0,0.0);//translate to 2nd tyre
glutSolidTorus(0.12f, .14f, 10, 25);

glTranslatef(0.0,0.0,-1.4);//translate to 3rd tyre
glutSolidTorus(0.12f, .14f, 10, 25);
glTranslatef(-1.68,0.0,0.0);//translate to 4th tyre which is behind
1st tyre i.e rear .back
glutSolidTorus(0.12f, .14f, 10, 25);
glTranslatef(.58,.52,0.7);//translate to origin
glRotatef(90.0,0.0,1.0,0.0);
glTranslatef(0.0,0.0,-1.40);

glutSolidTorus(0.2f, .2f, 10, 25);
```

```
glTranslatef(0.0,0.0,1.40);
glRotatef(270.0,0.0,1.0,0.0);


//bottom filling
glBegin(GL_POLYGON);
glColor3f(0.25,0.25,0.25);
 glVertex3f(-0.3,-.48,0.7);//e
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.81,-0.48,0.7);//f
glEnd();




glBegin(GL_POLYGON);
 glVertex3f(-.42,-.2,0.7);//d
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-0.3,-.48,-0.7);//e'
 glVertex3f(-0.3,-.48,0.7);//e
glEnd();

glBegin(GL_POLYGON);

glVertex3f(-1.2,-.28,0.7);//r
glVertex3f(-1.2,-.28,-0.7);//r'
glVertex3f(-1.12,-.48,-0.7);//a'
glVertex3f(-1.12,-.48,0.7);//a

glEnd();
```

```
glBegin(GL_POLYGON);
 glVertex3f(-1.12,-.48,0.7);//a
 glVertex3f(-1.12,-.48,-0.7);//a'
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-0.86,-.48,0.7);//b
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(-0.86,-.48,0.7);//b
 glVertex3f(-0.86,-.48,-0.7);//b'
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.74,-0.2,0.7);//c
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(-.74,-0.2,0.7);//c
 glVertex3f(-.74,-0.2,-0.7);//c'
 glVertex3f(-.42,-.2,-0.7);//d'
 glVertex3f(-.42,-.2,0.7);//d
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(.81,-0.48,0.7);//f
 glVertex3f(.81,-0.48,-0.7);//f'
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(.94,-0.2,0.7);//g
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(.94,-0.2,0.7);//g
 glVertex3f(.94,-0.2,-0.7);//g'
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.24,-.2,0.7);//h
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(1.24,-.2,0.7);//h
 glVertex3f(1.24,-.2,-0.7);//h'
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.38,-.48,0.7);//i
glEnd();

glBegin(GL_POLYGON);
 glVertex3f(1.38,-.48,0.7);//i
 glVertex3f(1.38,-.48,-0.7);//i'
 glVertex3f(1.52,-.44,-0.7);//j'
 glVertex3f(1.52,-.44,0.7);//j
glEnd();




//*******************************************************************
*************************8


// door outline- rear, front
glBegin(GL_LINE_LOOP);
glColor3f(1.0,1.0,1.0);
glVertex3f(-0.5,0.22,0.7);//hh
glVertex3f(0.0,0.22,0.7);//gg
```

```
glVertex3f(0.0,-0.2,0.7);//oo
glVertex3f(-0.5,-0.2,0.7);//pp


glEnd();




// door2 outline- near, driver

glBegin(GL_LINE_LOOP);

glVertex3f(0.12,0.22,0.7);//ll
glVertex3f(0.62,0.22,0.7);//kk
glVertex3f(0.62,-0.2,0.7);//mm
glVertex3f(0.12,-0.2,0.7);//nn
glEnd();



glColor3f(0.0,0.0,0.0);
// door2  outline- far, driver

glBegin(GL_LINE_LOOP);

glVertex3f(0.12,0.22,-0.7);//ll'
glVertex3f(0.62,0.22,-0.7);//kk'
glVertex3f(0.62,-0.2,-0.7);//mm'
glVertex3f(0.12,-0.2,-0.7);//nn'
glEnd();

// door outline- rear, far
```

```
glBegin(GL_LINE_LOOP);

glVertex3f(-0.5,0.22,-0.7);//hh'
glVertex3f(0.0,0.22,-0.7);//gg'
glVertex3f(0.0,-0.2,-0.7);//oo'
glVertex3f(-0.5,-0.2,-0.7);//pp'



glEnd();
glBegin(GL_POLYGON);//front**
glVertex3f(1.52,.14,0.7);//k
glVertex3f(1.52,.14,-0.7);//k'
glVertex3f(1.52,-.44,-0.7);//j'
glVertex3f(1.52,-.44,0.7);//j

glEnd();

glColor3f(0.0,0.0,1.0);

// transparent objects are placed next ..

 glBlendFunc(GL_SRC_ALPHA, GL_ONE_MINUS_SRC_ALPHA);//TRANCPARENCY3

//windscreen
 glBegin(GL_POLYGON);
glColor4f(0.0,0.0,0.0,0.7);   //COLOR =WHITE TRANSPARENT
 glVertex3f(0.562,.5,.6);//AAA
 glVertex3f(.562,.5,-.6);//AAA'
 glVertex3f(.76,.22,-.6);//MMM'
 glVertex3f(.76,.22,.6);//MMM
```

```
glEnd();

//rear window

glBegin(GL_POLYGON);

   //COLOR =WHITE TRANSPARENT


 glVertex3f(-1.068,0.5,0.6);//pp

 glVertex3f(-1.068,0.5,-0.6);//pp'

 glVertex3f(-1.2,0.22,-0.6);//qq'

 glVertex3f(-1.2,0.22,0.6);//qq


glEnd();

//leftmost window front

glBegin(GL_POLYGON);

 glVertex3f(-0.98,0.5,0.7);//aa

 glVertex3f(-0.64,0.5,0.7);//bb

 glVertex3f(-0.64,0.22,0.7);//cc

 glVertex3f(-1.08,0.22,0.7);//dd

glEnd();


//leftmost window back

glBegin(GL_POLYGON);


 glVertex3f(-0.98,0.5,-0.7);//aa

 glVertex3f(-0.64,0.5,-0.7);//bb

 glVertex3f(-0.64,0.22,-0.7);//cc

 glVertex3f(-1.08,0.22,-0.7);//dd

glEnd();


//middle window front


glBegin(GL_POLYGON);
```

```
glVertex3f(-0.5,0.5,0.7);

glVertex3f(0.0,0.5,0.7);

glVertex3f(0.0,0.22,0.7);

glVertex3f(-0.5,0.22,0.7);


glEnd();





//middle window back


glBegin(GL_POLYGON);


glVertex3f(-0.5,0.5,-0.7);

glVertex3f(0.0,0.5,-0.7);

glVertex3f(0.0,0.22,-0.7);

glVertex3f(-0.5,0.22,-0.7);


glEnd();

//rightmost window front


glBegin(GL_POLYGON);


glVertex3f(0.12,0.5,0.7);//ii

glVertex3f(0.44,0.5,0.7);//jj

glVertex3f(0.62,0.22,0.7);//kk

glVertex3f(0.12,0.22,0.7);//ll
```

```
glEnd();



//rightmost window back

glBegin(GL_POLYGON);

glVertex3f(0.12,0.5,-0.7);//ii'
glVertex3f(0.44,0.5,-0.7);//jj'
glVertex3f(0.62,0.22,-0.7);//kk'
glVertex3f(0.12,0.22,-0.7);//ll'



glEnd();



////car code ends here
glColor3f(0.0,0.0,1.0);

}
void drawhouse()
{
 glBegin(GL_LINE_LOOP);

    glVertex3f(-2.6,-.84,2.5);//m
    glVertex3f(-2.6,0.84,2.5);//n
    glVertex3f(-3.04,0.84,2.8);//o
    glVertex3f(0,1.95,2.8);//p
    glVertex3f(3.04,0.84,2.8);//w
    glVertex3f(2.6,0.84,2.5);//q
    glVertex3f(2.6,-0.84,2.5);//r
```

```
      glVertex3f(1.59,-0.84,2.5);//s
   glVertex3f(1.59,0.16,2.5);//t
   glVertex3f(-1.59,0.16,2.5);//u
   glVertex3f(-1.59,-0.84,2.5);//v
   glEnd();
   glBegin(GL_LINES);
   glVertex3f(1.59,-0.84,2.5);//s
      glVertex3f(-1.59,-0.84,2.5);//v
   glEnd();

   glBegin(GL_LINE_LOOP);
      glVertex3f(-2.6,-.84,-2.5);//m'
   glVertex3f(-2.6,0.84,-2.5);//n'
   glVertex3f(-3.04,0.84,-2.8);//o'
   glVertex3f(0,1.95,-2.8);//p'
   glVertex3f(3.04,0.84,-2.8);//w'
   glVertex3f(2.6,0.84,-2.5);//q'
   glVertex3f(2.6,-0.84,-2.5);//r'
      glVertex3f(1.59,-0.84,-2.5);//s'
   glVertex3f(1.59,0.16,-2.5);//t'
   glVertex3f(-1.59,0.16,-2.5);//u'
   glVertex3f(-1.59,-0.84,-2.5);//v'
      glEnd();

      glBegin(GL_LINES);
      glVertex3f(-2.6,-.84,2.5);//m
    glVertex3f(-2.6,-.84,-2.5);//m'
       glVertex3f(-2.6,0.84,2.5);//n
glVertex3f(-2.6,0.84,-2.5);//n'
        glVertex3f(-3.04,0.84,2.8);//o
 glVertex3f(-3.04,0.84,-2.8);//o'
 glVertex3f(0,1.95,2.8);//p
  glVertex3f(0,1.95,-2.8);//p'

  glVertex3f(3.04,0.84,2.8);//w
     glVertex3f(3.04,0.84,-2.8);//w'
  glVertex3f(2.6,0.84,2.5);//q
  glVertex3f(2.6,0.84,-2.5);//q'
  glVertex3f(2.6,-0.84,2.5);//r
  glVertex3f(2.6,-0.84,-2.5);//r'
     glVertex3f(1.59,-0.84,2.5);//s
     glVertex3f(1.59,-0.84,-2.5);//s'

  glVertex3f(-1.59,-0.84,2.5);//v
     glVertex3f(-1.59,-0.84,-2.5);//v'



  glEnd();
  glColor3ub(255,185,1);//*************

  glBegin(GL_QUADS);
      glVertex3f(-2.6,-.84,2.5);//m
glVertex3f(-2.6,0.16,2.5);//uu
glVertex3f(-1.59,0.16,2.5);//u
glVertex3f(-1.59,-0.84,2.5);//v

     glVertex3f(-2.6,0.16,2.5);//uu
     glVertex3f(-2.6,0.84,2.5);//n
   glVertex3f(2.6,0.84,2.5);//q
glVertex3f(2.6,0.16,2.5);//tt
```

```
   glVertex3f(1.59,-0.84,2.5);//s
  glVertex3f(1.59,0.16,2.5);//t
      glVertex3f(2.6,0.16,2.5);//tt
 glVertex3f(2.6,-0.84,2.5);//r



      glVertex3f(-2.6,-.84,-2.5);//m'
glVertex3f(-2.6,0.16,-2.5);//uu'
glVertex3f(-1.59,0.16,-2.5);//u'
glVertex3f(-1.59,-0.84,-2.5);//v'

     glVertex3f(-2.6,0.16,-2.5);//uu'
     glVertex3f(-2.6,0.84,-2.5);//n'
   glVertex3f(2.6,0.84,-2.5);//q'
glVertex3f(2.6,0.16,-2.5);//tt'



   glVertex3f(1.59,-0.84,-2.5);//s'
  glVertex3f(1.59,0.16,-2.5);//t'
      glVertex3f(2.6,0.16,-2.5);//tt'
 glVertex3f(2.6,-0.84,-2.5);//r'

 glVertex3f(-2.6,-.84,2.5);//m
   glVertex3f(-2.6,-.84,-2.5);//m'
      glVertex3f(-2.6,0.84,-2.5);//n'
glVertex3f(-2.6,0.84,2.5);//n

glVertex3f(2.6,0.84,2.5);//q
  glVertex3f(2.6,0.84,-2.5);//q'
  glVertex3f(2.6,-0.84,-2.5);//r'
  glVertex3f(2.6,-0.84,2.5);//r
```

```
    glEnd();







   glBegin(GL_TRIANGLES);
glVertex3f(0,1.95,2.5);//p
      glVertex3f(3.04,0.84,2.5);//w
         glVertex3f(-3.04,0.84,2.5);//o
   glVertex3f(0,1.95,-2.5);//p'
      glVertex3f(3.04,0.84,-2.5);//w'
         glVertex3f(-3.04,0.84,-2.5);//o'

glEnd();
  glColor3ub(255,102,0);//***********top color

    glBegin(GL_QUADS);

     glVertex3f(0,1.95,2.8);//p
    glVertex3f(0,1.95,-2.8);//p'
       glVertex3f(3.04,0.84,-2.8);//w'
       glVertex3f(3.04,0.84,2.8);//w

     glVertex3f(-3.04,0.84,2.8);//o
   glVertex3f(-3.04,0.84,-2.8);//o'
   glVertex3f(0,1.95,-2.8);//p'
    glVertex3f(0,1.95,2.8);//p

          glEnd();
     glColor3ub(116,18,0);//*******base color

    glBegin(GL_QUADS);
    glVertex3f(-2.6,-.84,2.5);//m
          glVertex3f(2.6,-0.84,2.5);//r
    glVertex3f(2.6,-0.84,-2.5);//r'
    glVertex3f(-2.6,-.84,-2.5);//m'
    glEnd();



}




GLuint createDL() {
 GLuint carrDL;

 // Create the id for the list
 carrDL = glGenLists(1);

 // start list
 glNewList(carrDL,GL_COMPILE);

 // call the function that contains the rendering commands
  drawcarr();

 // endList
 glEndList();
 return(carrDL);
}
GLuint createDL2()//******************
{
 GLuint houseDL;

 // Create the id for the list
 houseDL = glGenLists(1);

 // start list
 glNewList(houseDL,GL_COMPILE);

 // call the function that contains the rendering commands
  drawhouse();

 // endList
 glEndList();

 return(houseDL);
}//**************

void initScene()
{

 glEnable(GL_DEPTH_TEST);
 carr_display_list = createDL();
 house_display_list= createDL2();//***********

}
```

```
void renderScene(void)
{
 int i,j;
 glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);
 glClearColor(.7,0.85,1.0,1.0);

// Draw ground

 glColor3f(0.25f, 0.25f, 0.25f);
 glBegin(GL_QUADS);
  glVertex3f(-100.0f, 0.0f, -100.0f);
  glVertex3f(-100.0f, 0.0f,  100.0f);
  glVertex3f( 100.0f, 0.0f,  100.0f);
  glVertex3f( 100.0f, 0.0f, -100.0f);
 glEnd();

// Draw 36 car

 for( i = -3; i < 3; i++)
  for( j=-3; j < 3; j++)
  {
   glPushMatrix();
   glTranslatef((i)*10.0,0,(j) * 10.0);
   glColor3ub(a[i],b[j],c[i]);
   glCallList(carr_display_list);
   glPopMatrix();
  }
```

```
if(housevisible)
{
glPushMatrix();
  glScalef(2.0,2.0,2.0);
  glTranslatef(0.0,.85,-20.0);
  glCallList(house_display_list);
          glTranslatef(10.0,0.0,0.0);
    glCallList(house_display_list);
         glTranslatef(-20.0,0.0,0.0);
    glCallList(house_display_list);

  glRotatef(90,0.0,1.0,0.0);
        glTranslatef(-10.0,0.0,-10.0);
  glCallList(house_display_list);

  glTranslatef(-10.0,0.0,0.0);
  glCallList(house_display_list);
  glTranslatef(-10.0,0.0,0.0);
  glCallList(house_display_list);
  glPopMatrix();

 glPushMatrix();
        glTranslatef(10.0,3.4,-80.0);
        glScalef(4.0,4.0,4.0);
  glCallList(house_display_list);
  glTranslatef(-10.0,0.0,0.0);
  glCallList(house_display_list);
 glPopMatrix();

        glPushMatrix();
           glRotatef(90,0.0,1.0,0.0);
```

```
   glScalef(2.0,2.0,2.0);

   glTranslatef(0.0,0.85,15.0);

            glCallList(house_display_list);

   glTranslatef(10.0,0.,0.0);

            glCallList(house_display_list);

                 glTranslatef(-20.0,0.,0.0);

            glCallList(house_display_list);

        glPopMatrix();


}

if(fxincr!=0)

theta1=(atan(fzincr/fxincr)*180)/3.141;

else if(fzincr>0)

 theta1=-90.0;

else theta1=90.0;


if(fxincr>0&&fzincr<0)

{

 theta1=-theta1;

}

else if(fxincr<0&&fzincr<0)

{

 theta1=180-theta1;

}

else if(fxincr<0&&fzincr>0)

{

 theta1=-180-theta1;

}else if(fxincr>0&&fzincr>0)

{

theta1=-theta1;

}
```

```
 //else theta1=90;
 //glLoadIdentity();
    glPushMatrix();
    glTranslatef(fx,0,fz);
    glRotatef(theta1,0,1,0);
    glColor3f(0.8,0.8,0);
    glCallList(carr_display_list);
    glPopMatrix();

    glutSwapBuffers();

}

void orientMe(float ang)
{
    lx = sin(ang);
 lz = -cos(ang);
 glLoadIdentity();
 gluLookAt(x, y, z,
        x + lx,y + ly,z + lz,
     0.0f,1.0f,0.0f);

}



void moveMeFlat(int i)
{
if(xxxx==1)
  y=y+i*(lz)*0.1;//*********

if(yyyy==1)
```

```
{
 x=x+i*(lz)*.1;
}
else
{
 z = z + i*(lz)*0.5;
           x = x + i*(lx)*0.5;}
glLoadIdentity();
 gluLookAt(x, y, z,
        x + lx,y + ly,z + lz,
     0.0f,1.0f,0.0f);


}


void processNormalKeys(unsigned char key, int x, int y)
{
glLoadIdentity();



 if (key == 'q')
  exit(0);
         if(key=='t')
          gluLookAt(1,190,50,0,0 ,-10,0.0,1.0,.0);
  if(key=='a') moveMeFlat(4);xxxx=1,yyyy=0;
     if(key=='s') moveMeFlat(-4);xxxx=1,yyyy=0;
       if(key=='w') moveMeFlat(4);yyyy=1;xxxx=0;
       if(key=='d') moveMeFlat(-4);yyyy=1;xxxx=0;
```

```
}


void inputKey(int key, int x, int y)
{

 switch (key)
 {
  case GLUT_KEY_LEFT : angle -= 0.05f;orientMe(angle);break;
  case GLUT_KEY_RIGHT : angle +=0.05f;orientMe(angle);break;
  case GLUT_KEY_UP : moveMeFlat(2);xxxx=0,yyyy=0;break;
  case GLUT_KEY_DOWN : moveMeFlat(-2);xxxx=0,yyyy=0;break;

 }
}
void movecar(int key, int x, int y)
{

 switch (key)
 {
  case GLUT_KEY_LEFT :temp=fxincr;
       fxincr=fxincr*cos(theta)+fzincr*sin(theta);
       fzincr=-temp*sin(theta)+fzincr*cos(theta);
       fx+=fxincr;
       fz+=fzincr;

       break;
  case GLUT_KEY_RIGHT :temp=fxincr;
       fxincr=fxincr*cos(-theta)+fzincr*sin(-theta);
       fzincr=-temp*sin(-theta)+fzincr*cos(-theta);
       fx+=fxincr;
       fz+=fzincr;

       break;
  case GLUT_KEY_UP :fx+=fxincr;
        fz+=fzincr;break;
  case GLUT_KEY_DOWN :fx-=fxincr;
                  fz-=fzincr; break;

 }
 glutPostRedisplay();
}

// Reset flags as appropriate in response to menu selections
void ProcessMenu(int value)
{
    glutPostRedisplay();
}

void ProcessMenu1(int value)
{
 switch(value)
 {
 case 1:if(housevisible==0)
          housevisible=1;
   else
    housevisible=0;
      glutPostRedisplay();
   break;
 case 2:if(movecarvar==0)
  {
  glutSpecialFunc(movecar);
```

```
        movecarvar=1;
     }
 else{
  glutSpecialFunc(inputKey);
  movecarvar=0;
     }
  break;
 }
}
void menu()
{
 int control;
    int control1;



 control= glutCreateMenu(ProcessMenu);
 glutAddMenuEntry("**CONTROLS**",1);
 glutAddMenuEntry("1)  UP KEY:to move in Forward Direction.",1);
 glutAddMenuEntry("2)  DOWN KEY:to move  in Backward Direction.",1);
 glutAddMenuEntry("3)  LEFT KEY:to Turn Left .",1);
 glutAddMenuEntry("4)  RIGHT KEY:to Turn Right .",1);
 glutAddMenuEntry("5)  d:moves Towards Right. ",1);
 glutAddMenuEntry("6)  a:moves Towards Left.",1);
 glutAddMenuEntry("7)  s:moves Away.",1);
 glutAddMenuEntry("8)  w:moves Near.",1);
 glutAddMenuEntry("9)  t:Top view.",1);
 glutAddMenuEntry("10) q:Quit.",1);
 glutAttachMenu(GLUT_RIGHT_BUTTON);
    control1=glutCreateMenu(ProcessMenu1);
 glutAddMenuEntry("HOUSE",1);
 glutAddMenuEntry("MOVE CAR",2);
 glutAttachMenu(GLUT_LEFT_BUTTON);

}


int main(int argc, char **argv)
{
 glutInit(&argc, argv);
 glutInitDisplayMode(GLUT_DEPTH | GLUT_DOUBLE | GLUT_RGBA);
 glutInitWindowPosition(0,0);
 glutInitWindowSize(1010,710);
 glutCreateWindow("car lot");

 initScene();

 glutKeyboardFunc(processNormalKeys);
 glutSpecialFunc(inputKey);
    menu();
 glutDisplayFunc(renderScene);
 glutIdleFunc(renderScene);

 glutReshapeFunc(changeSize);

 glutMainLoop();

 return(0);
}
```