**TUGAS BESAR**

**KOMPUTER GRAFIKA**

**“ILUSTRASI KOTA”**



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**BAB I**

**PENDAHULUAN**

* 1. **Pendahuluan**

Ada suatu pepatah yang mengatakan bahwa “*a picture worths thousands words*”, sebuah gambar dapat bicara ribuan cerita. Meskipun tampak terlalu dilebihkan namun paling tidak dapat disetujui makna yang tersirat dalam pepatah tersebut. Informasi yang disajikan secara naratif memang sangat umum dijumpai dan hal itu juga memiliki daya tarik tersendiri. Namun penyajian naratif memerlukan metode pemindaian berurutan, sedangkan dalam bentuk grafis pemindaian ini dapat dilakukan secara serentak.

Pernyataan di atas merupakan salah satu manfaat dari visualisasi grafis, sedangkan manfaat dan aplikasi lainnya begitu banyaknya, dari visualisasi hingga perancangan, dari reproduksi gambar hingga animasi, dan sebagainya. Para pakar di bidang ini mengklaim bahwa grafika komputer, begitu diterjemahkan dari *computer graphics*, merupakan area yang paling menarik dalam bidang ilmu komputer.

Grafika komputer secara umum dianggap sebagai cabang ilmu komputer yang berkaitan dengan teori dan teknologi yang digunakan untuk menyintesa citra berkomputer. Citra dihasilkan computer dengan cara melukiskan pemindaian mulai dari bersifat paling sederhana seperti renrengan segitiga sampai yang mempunyai latar belakang seragam dan rumit seindah burung merak di suatu taman, atau semulus rangkaian pulau-pulau Indonesia yang terdapat dalam peta. Sebagai ilmu, bidang grafika komputer memang dikaji dalam disiplin ilmu komputer, namun dalam penerapannya ternyata begitu banyak pihak yang terlibat – seni lukis, musik, sinematografi, dan lain-lain.

* 1. **Pengamatan**

Secara alamiah, misalkan akan digambarkan renrengan segitiga. Pada kehidupan nyata, peristiwa ini dimulai dengan membuat ke putusan dengan mempertimbangkan ciri-ciri geometri yang sesuai dengan jenis dan ukuran segitiga, diikuti dengan tindakan menggerakkan alat tulis, seperti pinsil, untuk melukiskannnya ke kertas. Dalam istilah komputer, khususnya grafika komputer, apa yang dicitrakan disebut *objek*, yang menyatakan segitiga di dalam ruang abstrak terpilih, yang kemudian ruang ini disebut sebagai *ruang objek*. Sedangkan, tindakan untuk melukiskan objek secara pemetaan

berdasarkan pemikiran sebagai suatu segitiga di atas kertas, yang menyusun permukaan tayang berterusan pada ruang lain disebut *ruang citra*. Tindakan pemetaan ini dipengaruhi oleh faktorfaktor yang berkaitan dengan lokasi dan orientasi objek.

Area selanjutnya dari grafika komputer berkaitan dengan penempatan segitiga yang disebut transformasi, dan oleh karena itu digunakan matrik untuk merealisasikan pemetaan segitiga ke tujuan akhirnya dalam ruang citra. Matrik transformasi dipasangkan untuk mengendalikan lokasi dan orientasi penayangan segitiga, memperbesar atau memperkecil ukurannya. Dengan demikian, dengan mengalikan pemasangan untuk matrik transformasi, computer diperintahkan untuk menayangkan beberapa segitiga dengan beragam ukuran dan orientasi pada lokasi yang berbeda, semua dari model yang sama di dalam ruang objek.

Dapat dipastikan bahwa perbedaan melukiskan segitiga di atas kertas dan segitiga ditayangkan pada monitor komputer. Pembentuknya terdiri dari verteks-verteks yang dihubungkan dengan edge-edge yang mulus, sedangkan pada komputer tidak secara pasti melukiskan garis. Alasan ini didasarkan atas ruang citra di dalam grafika komputer, secara umum tidak berkelanjutan, tetapi terdiri dari sehimpunan piksel diskrit, yaitu unsur-unsur gambar yang di susun masing-masing di dalam wujud baris dan kolom. Penggal garis horizontal dan vertikal menjadi sekumpulan piksel adjasen dalam baris dan kolom, dan penggalan garis miring kadangkala disusun seperti bertangga-tangga. Area grafika komputer yang bertanggung jawab untuk mengubah gambar berkelanjutan, seperti penggalan garis, ke dalam pendekatan diskritnya disebut konversi atau pengubahan pindai.

**1.3 Terapan**

Secara garis besar dapat digolongkan penggunakaan grafika computer dalam beberapa bidang:

* *Antarmuka pemakai* (*user interface*): Mungkin kurang disadari tetapi sudahlah jelas bahwa banyak yang telah menggunakannya. Tetingkap misalnya, adalah contoh sistem antarmuka grafis (*graphical user interface*, GUI). pemanfaatannya telah banyak mempermudah pemakai dalam menggunakan komputer.
* *Visualisasi*: Bayangkan jika harus ditarik kesimpulan dari hasil percobaan yang berupa sekumpulan angka-angka. Dalam batas-batas tertentu pekerjaan demikian masih bisa dilakukan, namun pada keadaan di mana data tersebut mencerminkan perilaku dengan peubah yang menjelaskan perubahan sejumlah peubah lainnya dan data tersebut dalam jumlah yang besar, maka bantuan visualisasi grafis akan sangat diperlukan. Dengan grafika komputer dimungkinkan juga visualisasi proses suatu simulasi.
* *Medis*: Banyak sekali alat canggih kedokteran yang secara waktu nyata menampilkan gambar yang digunakan untuk mempermudah diagnosa. Misalnya, MRI, CT-Scan, USG, dan lainnya. Tampilantampilan grafis tersebut tentu saja memerlukan teknik grafika komputer yang canggih agar diperoleh gambar yang bermutu.
* *Perancangan bersifat geometris*: Dulu dan bahkan masih banyak melakukannya hingga kini, para perancang otomotif misalnya, bekerja dengan tanah liat sebagai media pembuatan rancangannya, arsitek bekerja dengan media kertas, perancang model pakaian dengan pola, dan lainnya. Pada waktu perancangan, seorang artis memerlukan media kongkrit untuk membuat model rancangannya. Dengan bantuan grafika komputer perancangan ini bukan saja akan lebih mudah, hemat dan praktis, tetapi akan lebih cepat dan akurat.
* *Sistem multimedia*: Grafika komputer memegang peranan yang sangat penting pada sistem multimedia. Sesuai dengan namanya, system multimedia melibatkan lebih dari sari media kompunikasi. Salah satu media tersebut, yang ternyata berperan sangat penting adalah media grafis.

**BAB 2**

**ISI TUGAS KOMPUTER GRAFIKA**

**2.1 Perencanaan**

Dalam melaksanakan tugas besar komputer grafika, kelompok kami disini akan membangun ‘Ilustrasi Kota’ alesan kami mengambil tema tersebut karena dengan tema itu kelompok kami dapat mengapresiasikan dari apa yang telah diajarkan dalam 1 semester ini. Banyak bangunan-bangunan yang kelompok kami terapkan pada tugas besar ini.

**2.2 Progress**

Adapun progress yang akan kelompok kami buat seperti diperinci pada tabel dibawah ini:

|  |  |  |
| --- | --- | --- |
| No. | Komponen | Progres |
| 1. | Gedung Perkantoran |  |
| 2. | Taman |  |
| 3. | Penangkal petir |  |
| 4. | Lampu |  |
| 5. | Jalan |  |
| 6. | Jam Bigbang |  |
| 7. | Mesjid |  |
| 8. | Tower |  |
| 9. | Parabola |  |
| 10. | Tanah |  |
| 11. | Trotoar |  |
| 12. | Jendela |  |
| 13. | Taman Kota |  |
| 14. | Rumput Taman |  |
| 15. | Atap Lobi |  |
| 16. | Lantai Lobi |  |
| 17. | Pintu |  |
| 18. | Pagar |  |
| 19. | Menara Eifel |  |
| 20. | Pagoda |  |
| 21. | Lampu lalu lintas |  |
| 22. | Monas |  |
| 23. | Balon Gas |  |
| 24. | Mobil |  |
| 25. | Gedung sate |  |

**2.3 Spesifikasi**

Dalam spesifikasi ini kelompok kami akan memaparkan apa saja yang akan digunakan.

* Bahasa pemograman yang digunakan untuk membangun menggunakan C++
* Tools yang digunakan
* Dev C++
* OpenGL Utility
* Spesifikasi PC yang digunakan untuk membangun menggunakan:
* Windows 7 Ultimate
* Intel Core2duo CPU T6400 @2.00 Ghz
* Memory 3 GB
* Geforce 9200 M GS 1522 MB
* Harddisk 250 GB
* Konsep Komputer Grafika yang akan diimplemenatasikan
* Objek 2D
* Objek 3D
* Konsep Transformasi
* Clipping
* Lighting
* Camera
* Perspek
* Ukuran layar Program tergantung pada monitor, dan akan langsung Full Screen

**2.4 Interaksi Program**

Dari program yang dibuat, terdapat beberapa interkasi yang dilakukan oleh keyboard, diantaranya :

1. Tombol Atas, untuk memutarkan kamera keatas
2. Tombol Bawah, untuk memutarkan kamera kebawah
3. Tombol Kiri, untuk memutarkan kamera ke kiri
4. Tombol Kanan, untuk memutarkan kamera ke kanan
5. Tombol “A” untuk melihat objek dari sisi kiri
6. Tombol “S”, untuk melihat objek dari bawah
7. Tombol “D”, untuk melihat objek dari sisi kanan
8. Tombol “W”, untuk melihat objek dari atas
9. Tombol “F”, untuk menggerakan mobil ke sumbu X Positif
10. Tombol “H” untuk menggerakan mobil ke X NegatifTerdapat

beberapa objek yang akan bertransformasi sesuai dengan fungsinya, contoh (Jam BigBang, Lampus Lalu Lintas)

**BAB 3**

**KESIMPULAN**

**3.1 Kesimpulan**

Berdasarkan hasil ilustrasi kota pada OpenGL dengan Builder DevC++ dan bahasa pemrograman C++ maka dapat diambil kesimpulan sebagai berikut :

* Objek yang dibuat bersifat 3D yang terdiri dari kubus, kerucut, torus, bola.
* Teknik yang dipakai transformasi, lighting, transfaransi, shading, camera, zoom in dan zoom out.

**3.2 Saran**

Adapun saran dari kelompok kami, untuk pengembanganya dapat ditambah dengan beberapa teknik seperti: Interaksi diperbanyak, mempercantik design, mempersingkat source code, menambahkan texture, menambahkan teknik shadow

memperbanyak fasilitas kota, dan memperhalus gerakan mobil.

Dengan tugas ini mudah-mudahan dapat membantu bagi yang menggunakannya dan menambah ilmu bagi yang membacanya.

**LAMPIRAN**

**SOUCE CODE PROGRAM**

#include <GL/glu.h>

#include <GL/gl.h>

#include <GL/glut.h>

#include <math.h>

#include <time.h>

#include <sys/timeb.h>

float sumbux=0.0, sumbuy=0.0, sumbuz=0.0;

float sudut=0.0f;

float vektorx=0.0f, vektorz=-1.0f;

float x=0.0f, z=5.0f;

float pindahx =0.0, pindahy=0.0, pindahz=0.0;

float xpos = 0, ypos = 0, zpos = 0, xrot = 0, yrot = 0, putary=0, angle=0.0; //Rotasi Sudut

float inner, outer; int garisv,garish; //Variabel Torus

const float clockR = 0.5f,

clockVol = 1.0f,

angle1min = M\_PI / 30.0f,

minStart = 0.9f,

minEnd = 1.0f,

stepStart = 0.8f,

stepEnd = 1.0f;

float angleHour = 0,

angleMin = 0,

angleSec = 0;

//FUNGSI JAM

void newLine(float rStart, float rEnd, float angle){

float c = cos(angle), s = sin(angle);

glVertex2f( clockR\*rStart\*c, clockR\*rStart\*s);

glVertex2f( clockR\*rEnd\*c, clockR\*rEnd\*s);

}

void jam (void)

{

glColor3f(1.0f, 0.0f, 0.0f);

glLineWidth(2.0f);

glEnable(GL\_LINE\_SMOOTH);

glEnable(GL\_POINT\_SMOOTH);

glEnable(GL\_POLYGON\_SMOOTH);

glBegin(GL\_LINES);

for(int i=0; i<60; i++){

if(i%5){ // normal minute

if(i%5 == 1)

glColor3f(1.0f, 1.0f, 1.0f);

newLine(minStart, minEnd, i\*angle1min);

}else{

glColor3f(1.0f, 0.0f, 0.0f);

newLine(stepStart, stepEnd, i\*angle1min);

}

}

glEnd();

glLineWidth(3.0f);

glBegin(GL\_LINES);

newLine(0.0f, 0.5f, -angleHour+M\_PI/2);

newLine(0.0f, 0.8f, -angleMin+M\_PI/2);

glEnd();

glLineWidth(1.0f);

glColor3f(0.0f, 0.0f, 1.0f);

glBegin(GL\_LINES);

newLine(0.0f, 0.8f, -angleSec+M\_PI/2);

glEnd();

}

void TimerFunction(int value){

struct timeb tb;

time\_t tim=time(0);

struct tm\* t;

t=localtime(&tim);

ftime(&tb);

angleSec = (float)(t->tm\_sec+ (float)tb.millitm/1000.0f)/30.0f \* M\_PI;

angleMin = (float)(t->tm\_min)/30.0f \* M\_PI + angleSec/60.0f;

angleHour = (float)(t->tm\_hour > 12 ? t->tm\_hour-12 : t->tm\_hour)/6.0f \* M\_PI+

angleMin/12.0f;

glutPostRedisplay();

glutTimerFunc(33,TimerFunction, 1);

}

//AKHIR FUNGSI JAM

void bangun (int w, int h)

{

if (h == 0)

h = 1;

float rasio = w \* 1.0 / h;

glMatrixMode (GL\_PROJECTION);

glLoadIdentity();

glViewport (0,0, w, h);

gluPerspective(70.0f, rasio, 0.3f, 100.0f);

glMatrixMode(GL\_MODELVIEW);

glOrtho(0.0,2.0,0.0,2.0,-2.0,2.0);

}

void init (void)

{

GLfloat mat\_specular[] = {1.0, 1.0, 1.0, 1.0};

GLfloat mat\_shininess[] = {50.0};

GLfloat light\_position[] = {1.0, 1.0, 1.0, 1.0};

GLfloat white\_light[] = {1.0, 1.0, 1.0, 1.0};

GLfloat lmodel\_ambient[] = {0.1, 0.1, 0.1, 1.0};

glClearColor (0.0, 0.0, 0.0, 0.0);

glShadeModel (GL\_SMOOTH);

//SHADING

glMaterialfv(GL\_FRONT,GL\_SPECULAR, mat\_specular);

glMaterialfv(GL\_FRONT,GL\_SHININESS, mat\_shininess);

glLightfv(GL\_LIGHT0, GL\_POSITION, light\_position);

glLightfv(GL\_LIGHT0, GL\_DIFFUSE, white\_light);

glEnable(GL\_DEPTH\_TEST);

}

//Garis Koordinat

void koordinatx(void)

{

glBegin(GL\_LINE\_STRIP);

glVertex2f(-4,0);

glVertex2f(-2.6,0);

glEnd();

}

void koordinaty(void)

{

glBegin(GL\_LINE\_STRIP);

glVertex2f(0,3);

glVertex2f(0,-3);

glEnd();

}

void koordinatz(void)

{

glBegin(GL\_LINE\_STRIP);

glVertex2f(0,0);

glVertex2f(5.4,3);

glEnd();

}

// Akhir Garis Koordinat

//kerucut

void cone (float diameter, float tinggi, int garisv, int garish)

{

glutSolidCone(diameter,tinggi,garisv,garish);

}

void wirecone (float diameter, float tinggi, int garisv, int garish)

{

glutWireCone(diameter,tinggi,garisv,garish);

}

//BANGUN

void kubus (void)

{

glutWireCube(0.5);

}

void kubussolid (void)

{

glutSolidCube(0.5);

}

void bola ()

{

glutWireSphere(0.5,10,10);

}

void bolasolid (float diameter, int garisv, int garish)

{

glutSolidSphere(diameter,garisv,garish);

}

void torus(float inner, float outer, int garisv, int garish)

{

glutWireTorus(inner,outer,garisv,garish);

}

void torussolid(float inner, float outer, int garisv, int garish)

{

glutSolidTorus(inner,outer,garisv,garish);

}

void icosahedron()

{

glutWireIcosahedron();

}

void dodecahedron()

{

glutWireDodecahedron();

}

void dodecahedronsolid()

{

glutSolidDodecahedron();

}

void kotak ()

{

glBegin(GL\_QUADS);

glVertex2f(0.1,0.2);

glVertex2f(0.2,0.2);

glVertex2f(0.2,0.1);

glVertex2f(0.1,0.1);

glEnd();

}

void jendela ()

{

}

//AKHIR BANGUN

//CAMERA

void camera (void) {

glRotatef(xrot,1.0,0.0,0.0);

glRotatef(yrot,0.0,1.0,0.0);

glTranslated(-xpos,-ypos,-zpos);

}

void display (void)

{

const double waktu = glutGet (GLUT\_ELAPSED\_TIME) / 1000.0;

const double lama1 = 50\*waktu, lama2 = 10\*waktu, lama3 = waktu/10, lama4=10\*waktu;

GLdouble eqn[4] = {0.0, 0.0, 1.0, 0.0};

GLdouble eqn2[4] = {1.0, 0.0, 0.0, 0.0};

GLdouble eqn3[4] = {0.0, 1.0, 0.0, 0.0};

GLfloat mat\_transparent[] = { 0.1, 0.8, 0.8, 0.6 };

GLfloat mat\_emission[] = { 0.0, 0.3, 0.3, 0.6 };

GLfloat mat\_solid[] = { 0.75, 0.75, 0.0, 1.0 };

GLfloat mat\_zero[] = { 0.0, 0.0, 0.0, 1.0 };

//GLfloat light\_position[] = {0.0, 0.0, 1.0, 1.0};

glClear(GL\_COLOR\_BUFFER\_BIT | GL\_DEPTH\_BUFFER\_BIT);

glClearColor(0.7,0.7,1.0,0.5);

glLoadIdentity();

//Setting Kamera

gluLookAt(x, 0.0, z, x+vektorx, 0.0, z+vektorz, 0.0, 1.0, 0.0);

camera();

glEnable(GL\_TEXTURE\_2D);

glEnable(GL\_COLOR\_MATERIAL);

//glColorMaterial(GL\_FRONT,GL\_SPECULAR);

glPushMatrix();

//CLIP untuk Y < 0

glClipPlane(GL\_CLIP\_PLANE0,eqn);

glEnable(GL\_CLIP\_PLANE0);

//CLIP untuk X < 0

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glPopMatrix();

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPushMatrix();

glTranslatef(0.0,0.0,-2.0);

koordinatx();

glPopMatrix();

//koordinaty();

//koordinatz();

//penangkal Petir

glPushMatrix();

glColor3f(0.0,0.0,0.0);

glTranslatef(-0.36,0.80,-1.76);

glScalef(0.05,0.5,0.05);

glRotatef(-90.0,1.0,0.0,0.0);

cone (0.5,0.7,30,6);

glPopMatrix();

//TANAH

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.0,0.0,0.0);

glTranslatef(0.0,-1.0,-1);

glScalef(19.0,0.05,20.0);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

kubussolid();

glPopMatrix();

//AKHIR TANAH

//trotoar 1

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.4,0.7,1.0);

glTranslatef(0.008,-0.98,-0.26);

glScalef(0.27,0.02,4.7);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.632,-0.98,-1.0);

glScalef(0.27,0.02,4.7);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 00

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.5,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 01

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.45,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 02

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.40,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 03

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.35,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 04

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.30,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 05

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.25,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 06

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.20,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 07

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.15,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//trotoar 08

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(0.10,-0.98,0.0);

glScalef(0.05,0.02,0.25);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 1

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.7,0.4,0.4);

glTranslatef(1.0,-0.5,-0.8);

//glTranslatef(pindahx,pindahy,pindahz);

glScalef(1.2,2.0,3.9);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

for(int i=0; i<=8; i++)

{

for(int j=0; j<6; j++)

{

glPushMatrix();

glTranslatef(0.0,-(j/10.0)\*1.5,-(i/10.0)\*2.0);

//jendela 1.1

glPushMatrix();

glColor3f(0.0,0.0,0.8);

glTranslatef(1.0,-0.1,0.0);

glScalef(1.23,0.2,0.25);

kubussolid();

glPopMatrix();

//jendela 1.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(1.0,-0.1,0.03);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

//jendela 1.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(1.0,-0.1,-0.03);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

}

}

//jendela 1.2.1 (depan)

for(int i=0; i<=2; i++)

{

for(int j=0; j<6; j++)

{

glPushMatrix();

glTranslatef((i/10.0)\*2.0,-(j/10.0)\*1.5,0.0);

glPushMatrix();

glTranslatef(0.81,0.0,-4.0);

glScalef(1.0,1.0,3.2);

glRotatef(-90,0.0,1.0,0.0);

//jendela 2.1

glPushMatrix();

glColor3f(0.0,0.0,0.8);

glTranslatef(1.0,-0.1,0.0);

glScalef(1.23,0.2,0.25);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(1.0,-0.1,0.03);

glScalef(1.24,0.17,0.07);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(1.0,-0.1,-0.03);

glScalef(1.24,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//AKHIR JENDELA (DEPAN

//JENDELA GEDUNG 2

for(int i=0; i<=3; i++)

{

for(int j=0; j<4; j++)

{

glPushMatrix();

glTranslatef(0.0,-(j/10.0)\*1.5,-(i/10.0)\*2.0);

//jendela 2.1

glPushMatrix();

glColor3f(0.0,0.0,0.8);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.23,0.2,0.25);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

}

}

//jendela gedung double

for(int i=0; i<=3; i++)

{

for(int j=0; j<9; j++)

{

glPushMatrix();

glTranslatef(0.0,-(j/10.0)\*1.5,-(i/10.0)\*1.75);

//jendela 2.1

glPushMatrix();

glColor3f(0.0,0.0,0.8);

glTranslatef(-1.699,0.43,-0.5);

glScalef(1.23,0.2,0.25);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-1.699,0.43,-0.53);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-1.699,0.43,-0.47);

//glTranslatef(pindahx,pindahy,pindahz);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

}

}

//jendela gedung double 2

for(int i=0; i<=1; i++)

{

for(int j=0; j<9; j++)

{

glPushMatrix();

glTranslatef(0.0,-(j/10.0)\*1.5,-(i/10.0)\*1.255);

//jendela 2.1

glPushMatrix();

glColor3f(0.0,0.0,0.8);

glTranslatef(-1.699,0.43,-1.55);

glScalef(1.23,0.2,0.25);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-1.699,0.43,-1.58);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-1.699,0.43,-1.507);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

}

}

//jendela 2.2.1 (depan)

for(int i=0; i<=2; i++)

{

for(int j=0; j<4; j++)

{

glPushMatrix();

glTranslatef((i/10.0)\*2.0,-(j/10.0)\*1.5,0.0);

glPushMatrix();

glScalef(1.0,1.0,1.32);

glTranslatef(0.25,0.0,0.74);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.0,0.0,0.8);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.23,0.2,0.25);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//GEDUNG 2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.3,0.7,0.5);

glTranslatef(-0.36,-0.68,0.5);

//glTranslatef(pindahx,pindahy,pindahz);

glScalef(1.2,1.3,1.6);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 2.1

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,0.8,0.5);

glTranslatef(-0.36,-0.74,0.0);

//glTranslatef(pindahx,pindahy,pindahz);

glScalef(1.2,1.0,1.0);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 2.2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.5,1.0,0.567);

glTranslatef(-0.36,-0.80,-0.42);

//glTranslatef(pindahx,pindahy,pindahz);

glScalef(1.2,0.85,0.72);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 2.3

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.5,0.9,0.1);

glTranslatef(-0.36,-0.63,-1.0);

glScalef(1.2,1.5,1.6);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 3

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.5,0.8,1.0);

glTranslatef(-1.7,-0.25,-0.77);

glScalef(1.2,3.0,1.5);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 3.2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.5,0.8,1.0);

glTranslatef(-1.7,-0.25,-1.6);

glScalef(1.2,3.0,0.6);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 3 jembatan 1

glPushMatrix();

glColor3f(0.3,0.3,0.3);

glTranslatef(-1.72,-0.25,-1.4);

glScalef(0.4,0.4,1.0);

kubussolid();

glPopMatrix();

//GEDUNG 3 jembatan 2

glPushMatrix();

glColor3f(0.3,0.3,0.3);

glTranslatef(-1.72,0.3,-1.4);

glScalef(0.4,0.4,1.0);

kubussolid();

glPopMatrix();

//GEDUNG 3.1

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.3,0.3,0.3);

glTranslatef(-1.88,-0.49,-0.3);

glScalef(0.5,2.0,0.4);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 4

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(-1.7,-0.45,0.5);

glScalef(1.2,2.2,2.0);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//JENDELA

for (int i=0; i<=5; i++)

{

glPushMatrix();

glColor3f(0.6,0.7,0.4);

glTranslatef(-1.7,-(i/12.0)\*2.0,0.5);

glScalef(1.5,0.15,2.1);

kubussolid();

glPopMatrix();

}

//AKHIR JENDELA

//AKHIR GEDUNG 4

//GEDUNG 5

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(-0.36,-0.7,-1.75);

//glTranslatef(pindahx,pindahy,pindahz);

glScalef(1.2,1.2,1.2);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//GEDUNG 5.1

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(-0.36,-0.15,-1.75);

glScalef(1.0,2.0,1.0);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//JENDELA

for (int i=0; i<=5; i++)

{

glPushMatrix();

glColor3f(0.4,0.4,0.7);

glTranslatef((-i/13.0)-0.16,-0.02,-1.75);

glScalef(0.07,1.2,1.03);

kubussolid();

glPopMatrix();

}

//AKHIR GEDUNG 5.2

//GEDUNG 5.2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.0,1.0,1.0);

glTranslatef(-0.36,-0.12,-1.75);

//glTranslatef(pindahx,pindahy,pindahz);

glScalef(0.8,3.5,0.8);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//JENDELA

for (int i=0; i<=4; i++)

{

glPushMatrix();

glColor3f(0.4,0.4,0.7);

glTranslatef((-i/13.0)-0.20,0.55,-1.75);

glScalef(0.07,0.7,0.85);

kubussolid();

glPopMatrix();

}

//JAM BIGBANG

glPushMatrix();

glColor3f(0.7,0.7,0.7);

glTranslatef(-0.36,0.55,-1.53);

glScalef(0.3,0.3,0.01);

bolasolid(0.5,20,20);

glPopMatrix();

//JAM

glPushMatrix();

glTranslatef(-0.35,0.55,-1.52);

glScalef(0.3,0.3,0.3);

jam();

glPopMatrix();

//JAM

//AKHIR JAM BIGBANG

//TAMAN KOTA

glPushMatrix();

glScalef(1.0,1.0,3.0);

glTranslatef(0.0,-0.37,0.7);

glRotatef(90.0,1.0,0.0,0.0);

glPushMatrix();

glTranslatef(-1.04,-0.63,0.6);

glScalef(0.35,0.6,0.15);

glColor3f(1.0,0.4,0.1);

kubussolid();

glPopMatrix();

//TAMAN KOTA STENGAH LINGKARAN

glPushMatrix();

glColor3f(0.5,0.5,0.5);

glTranslatef(-1.04,-0.51,0.6);

glScalef(0.21,0.1,0.15);

glClipPlane(GL\_CLIP\_PLANE0,eqn);

glEnable(GL\_CLIP\_PLANE0);

glColor3f(1.0,0.4,0.1);

bolasolid(0.5,20,20);

glPopMatrix();

//TAMAN KOTA SETENGAH LINGKARAN

glPushMatrix();

glTranslatef(-1.04,-0.75,0.60);

glScalef(0.21,0.1,0.15);

glRotatef(180.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE0,eqn);

glEnable(GL\_CLIP\_PLANE0);

glColor3f(1.0,0.4,0.1);

bolasolid(0.5,20,20);

glDisable(GL\_CLIP\_PLANE0);

glPopMatrix();

glPopMatrix();

//RUMPUT TAMAN

glPushMatrix();

glTranslatef(-1.03,-0.93,0.23);

glScalef(0.28,0.1,1.3);

glColor3f(0.3,0.9,0.1);

kubussolid();

glPopMatrix();

glPopMatrix();

//AKHIR TAMAN

//atap lobby

glPushMatrix();

glTranslatef(1.0,-0.82,0.2);

glScalef(0.3,0.1,0.4);

glRotatef(0.0,-80.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE0,eqn);

glEnable(GL\_CLIP\_PLANE0);

glColor3f(1.0,0.4,0.1);

bolasolid(0.5,20,20);

glDisable(GL\_CLIP\_PLANE0);

glPopMatrix();

glPopMatrix();

//lantai lobby

glPushMatrix();

glColor3f(0.5,0.5,0.35);

glTranslatef(1.0,-0.98,0.25);

glScalef(0.5,0.03,0.4);

kubussolid();

glPopMatrix();

//tiang lobby 1 gedung 1

glPushMatrix();

glColor3f(0.9,0.9,0.9);

glTranslatef(0.9,-0.9,0.3);

glScalef(0.05,0.35,0.05);

kubussolid();

glPopMatrix();

//tiang lobby 2 gedung 1

glPushMatrix();

glColor3f(0.9,0.9,0.9);

glTranslatef(1.1,-0.9,0.3);

glScalef(0.05,0.35,0.05);

kubussolid();

glPopMatrix();

//pintu lobby gedung 1

glPushMatrix();

glColor3f(0.8,0.2,0.4);

glTranslatef(1.01,-0.9,0.19);

glScalef(0.27,0.3,0.05);

kubussolid();

glPopMatrix();

//pagar gedung 1

glPushMatrix();

glColor3f(0.8,0.2,0.4);

glTranslatef(1.68,-0.96,-0.49);

glScalef(0.03,0.2,4.7);

kubussolid();

glPopMatrix();

//pagar gedung 1

glPushMatrix();

glColor3f(0.8,0.2,0.4);

glTranslatef(0.71,-0.96,0.43);

glScalef(0.03,0.2,1.0);

kubussolid();

glPopMatrix();

//pagar gedung 1

glPushMatrix();

glColor3f(0.8,0.2,0.4);

glTranslatef(0.8,-0.96,0.68);

glScalef(0.35,0.2,0.03);

kubussolid();

glPopMatrix();

//pagar gedung 1

glPushMatrix();

glColor3f(0.8,0.2,0.4);

glTranslatef(1.4,-0.96,0.68);

glScalef(1.15,0.2,0.03);

kubussolid();

glPopMatrix();

//pagar gedung 1

glPushMatrix();

glColor3f(0.8,0.2,0.4);

glTranslatef(1.46,-0.96,-1.67);

glScalef(0.88,0.2,0.03);

kubussolid();

glPopMatrix();

//mesjid

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.8,0.2,0.4);

glTranslatef(1.9,-0.77,1.47);

glScalef(1.2,0.8,1.2);

kubussolid();

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glPopMatrix();

//AKHIR JAM BIGBANG

// AKHIR GEDUNG 5.2

//GEDUNG DIAPIT TABUNG

for (float i=0; i<7; i++)

{

glPushMatrix();

glTranslatef(-0.2,0.0+(i/5),0.4);

glRotatef(-90.0,0.0,1.0,0.0);

//tabung

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glPushMatrix();

glColor3f(1.2,1.6,0.1);

glTranslatef(-2.0,-0.94,-2.5);

glScalef(3.0,5.0,6.0);

glRotatef(90.0,1.0,0.0,0.0);

torussolid(0.01,0.03,50,50);

glPopMatrix();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

//gedung diapit tabung

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(1.2,1.6,0.1);

glTranslatef(-1.7,-0.94,-2.5);

glScalef(1.2,0.2,0.5);

kubussolid();

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glPopMatrix();

//tabung2

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glPushMatrix();

glColor3f(1.2,1.6,0.1);

glTranslatef(-1.4,-0.94,-2.5);

glScalef(3.0,5.0,6.0);

glRotatef(90.0,1.0,0.0,0.0);

torussolid(0.01,0.03,50,50);

glPopMatrix();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

//tabung2

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glPushMatrix();

glColor3f(1.0,1.0,0.6);

glTranslatef(-2.0,-0.842,-2.5);

glScalef(3.0,5.0,6.0);

glRotatef(90.0,1.0,0.0,0.0);

torussolid(0.01,0.03,50,50);

glPopMatrix();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

//gedung diapit tabung2

glPushMatrix();

glColor3f(1.0,1.0,0.6);

glTranslatef(-1.7,-0.842,-2.5);

glScalef(1.2,0.2,0.5);

kubussolid();

glPopMatrix();

//tabung22

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glPushMatrix();

glColor3f(1.0,1.0,0.6);

glTranslatef(-1.4,-0.842,-2.5);

glScalef(3.0,5.0,6.0);

glRotatef(90.0,1.0,0.0,0.0);

torussolid(0.01,0.03,50,50);

glPopMatrix();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

}

//AKHIR GEDUNG DIAPIT TABUNG

//GEDUNG X

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(-1.7,0.1,0.7);

glScalef(0.5,0.35,0.5);

glRotatef(90.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(1.0,0.5,0.5);

bolasolid(0.5,20,20);

//torussolid(0.1,0.1,20,20);

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//atap mesjid

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(1.9,-0.58,1.46);

glScalef(0.5,0.35,0.5);

glRotatef(90.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(1.0,1.0,0.6);

bolasolid(0.5,20,20);

//torussolid(0.1,0.1,20,20);

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//atap mesjid tiang

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(1.555,-0.16,1.85);

glScalef(0.085,0.13,0.085);

glRotatef(90.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(1.0,1.0,0.6);

bolasolid(0.5,20,20);

//torussolid(0.1,0.1,20,20);

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//atap mesjid tiang 2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(1.553,-0.16,1.1);

glScalef(0.085,0.13,0.085);

glRotatef(90.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(1.0,1.0,0.6);

bolasolid(0.5,20,20);

//torussolid(0.1,0.1,20,20);

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//atap mesjid tiang 3

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(2.2327,-0.16,1.1);

glScalef(0.085,0.13,0.085);

glRotatef(90.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(1.0,1.0,0.6);

bolasolid(0.5,20,20);

//torussolid(0.1,0.1,20,20);

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//atap mesjid tiang 4

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(2.2327,-0.16,1.85);

glScalef(0.085,0.13,0.085);

glRotatef(90.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(1.0,1.0,0.6);

bolasolid(0.5,20,20);

//torussolid(0.1,0.1,20,20);

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//tiang 1 mesjid

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.3,0.5,0.2);

glTranslatef(1.55,-0.55,1.85);

glScalef(0.15,1.65,0.15);

kubussolid();

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glPopMatrix();

//tiang 2 mesjid

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.3,0.5,0.2);

glTranslatef(2.23,-0.55,1.85);

glScalef(0.15,1.65,0.15);

kubussolid();

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glPopMatrix();

//tiang 3 mesjid

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.3,0.5,0.2);

glTranslatef(2.23,-0.55,1.10);

glScalef(0.15,1.65,0.15);

kubussolid();

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glPopMatrix();

//tiang 4 mesjid

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.3,0.5,0.2);

glTranslatef(1.55,-0.55,1.10);

glScalef(0.15,1.65,0.15);

kubussolid();

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glPopMatrix();

//jendela mesjid (depan)

for(int i=0; i<=4; i++)

{

for(int j=0; j<2; j++)

{

glPushMatrix();

glTranslatef((i/10.0)\*1.2,-(j/10.0)\*1.5,0.0);

glPushMatrix();

glScalef(0.18,0.85,0.75);

glTranslatef(10.0,-0.4,2.317);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.2,0.2,0.2);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.62,0.43,1.24);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.66,0.27,1.0);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//JENDELA SAMPING

glPushMatrix();

glScalef(0.93,1.0,1.0);

glTranslatef(0.15,0.0,3.5);

for (float i=0; i<4; i++)

{

for (int j=0; j<2; j++)

{

glPushMatrix();

glScalef(1.1,1.0,1.1);

glTranslatef(0.25,-(j/10.0)\*1.5,(-i/10.0)\*1.3);

glRotatef(90.0,0.0,1.0,0.0);

glPushMatrix();

glScalef(0.18,0.85,0.75);

glTranslatef(10.0,-0.4,2.317);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.2,0.2,0.2);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.62,0.43,1.24);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.66,0.27,1.0);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

glPopMatrix();

//AKHIR JENDELA SAMPING

//atap 5.1

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(-0.36,0.7,-1.75);

glScalef(0.3,0.25,0.3);

glRotatef(90.0,0.0,0.0,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn2);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(1.0,0.5,0.5);

bola();

//torussolid(0.1,0.1,20,20);

glDisable(GL\_CLIP\_PLANE1);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//BILLBOARD 1

glPushMatrix();

//glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glColor3f(0.5,0.5,1.0);

glTranslatef(1.0,0.1,0.15);

glScalef(3.0,0.25,0.1);

glRotatef(90,0.0,1.0,0.0);

torussolid(0.1,0.4,20,20);

//glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//ATAP

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

//glRotatef(90.0,1.0,0.0,0.0);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//AKHIR GEDUNG

//GEDUNG BERTINGKAT TANGGA

glPushMatrix();

glTranslatef(-3.0,-0.5,1.5);

glScalef(1.0,2.0,5.0);

//GEDUNG 1

for(float i=0; i<5; i++)

{

glColor3f(0.5,0.5,0.6);

glPushMatrix();

glTranslatef(0.0,i\*0.125,-(i\*0.075));

glScalef(1.0,(i+2)/2,0.15);

kubussolid();

glColor3f(0.0,0.0,0.0);

kubus();

glPopMatrix();

}

glPopMatrix();

//JENDELA 1

for (float i=0; i<=4; i++)

{

for (float j=0; j<8; j++)

{

glPushMatrix();

glTranslatef(-2.8-(i/10),-0.08-(j/10),0.75);

glScalef(0.15,0.2,3.755);

glColor3f(0.7,0.5,0.7);

kubussolid();

glColor3f(1.0,1.0,1.0);

glScalef(1.01,1.01,1.01);

kubus();

glPopMatrix();

}

}

//AKHIR JENDELA 1

//JENDELA 2

for (float i=0; i<=4; i++)

{

for (float j=0; j<4; j++)

{

glPushMatrix();

glTranslatef(-2.8-(i/10),0.4-(j/10),0.565);

glScalef(0.15,0.2,3.05);

glColor3f(0.7,0.5,0.7);

kubussolid();

glColor3f(1.0,1.0,1.0);

glScalef(1.01,1.01,1.01);

kubus();

glPopMatrix();

}

}

//AKHIR JENDELA 2

//JENDELA 3

for (float i=0; i<=4; i++)

{

for (float j=0; j<4; j++)

{

glPushMatrix();

glTranslatef(-2.8-(i/10),0.9-(j/10),0.378);

glScalef(0.15,0.2,2.285);

glColor3f(0.7,0.5,0.7);

kubussolid();

glColor3f(1.0,1.0,1.0);

glScalef(1.01,1.01,1.01);

kubus();

glPopMatrix();

}

}

//AKHIR JENDELA 3

//JENDELA 4

for (float i=0; i<=4; i++)

{

for (float j=0; j<4; j++)

{

glPushMatrix();

glTranslatef(-2.8-(i/10),1.4-(j/10),0.18);

glScalef(0.15,0.2,1.55);

glColor3f(0.7,0.5,0.7);

kubussolid();

glColor3f(1.0,1.0,1.0);

glScalef(1.01,1.01,1.01);

kubus();

glPopMatrix();

}

}

//AKHIR JENDELA 4

//JENDELA 4

for (float i=0; i<=4; i++)

{

for (float j=0; j<4; j++)

{

glPushMatrix();

glTranslatef(-2.8-(i/10),1.9-(j/10),0.0);

glScalef(0.15,0.2,0.8);

glColor3f(0.7,0.5,0.7);

kubussolid();

glColor3f(1.0,1.0,1.0);

glScalef(1.01,1.01,1.01);

kubus();

glPopMatrix();

}

}

//AKHIR JENDELA 4

//AKHIR GEDUNG BERTINGKAT

//MENARA EIFEL

glPushMatrix();

glTranslatef(3.5,0.3,-4.0);

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

//Eifel Tingkat 1

glPushMatrix();

glRotatef(45.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.7,0.6,0.4);

glRotatef(-90.0,1.0,0.0,0.0);

cone(0.5,3.0,4,1);

glColor3f(0.0,0.0,0.0);

wirecone(0.5,3.0,4,1);

glPopMatrix();

//Eifel Tingkat 2

glPushMatrix();

glColor3f(0.7,0.6,0.4);

glScalef(1.0,2.2,1.0);

glTranslatef(0.0,-0.3,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

cone(0.7,1,4,1);

glColor3f(0.0,0.0,0.0);

wirecone(0.7,1,4,1);

glPopMatrix();

//Eifel Tingkat 3

glPushMatrix();

glColor3f(0.7,0.6,0.4);

glScalef(1.0,2.2,1.0);

glTranslatef(0.0,-0.6,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

cone(1.0,1.0,4,1);

glPopMatrix();

//Eifel Tingkat Bontot

glPushMatrix();

glColor3f(0.7,0.6,0.4);

glTranslatef(0.0,2.6,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

cone(0.1,0.3,4,1);

glPopMatrix();

glPopMatrix();

//Kaki Eifel

glPushMatrix();

glScalef(1.6,1.6,1.6);

glTranslatef(0,-0.9,0.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn3);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(0.0,0.0,0.0);

bolasolid(0.52,20,20);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

//AKHIR KAKI EIFEL

glPopMatrix();

//AKHIR MENARA EIFEL

//AKHIR EIFEL

//PAGODA

glPushMatrix();

glTranslatef(2.4,-0.8,0.2);

glScalef(0.5,0.5,0.5);

//Kotak 1

glPushMatrix();

glTranslatef(0.0,-0.2,0.0);

glScalef(2.5,0.8,2.5);

glColor3f(0.9,0.8,0.8);

kubussolid();

glPopMatrix();

//GENTENG 1

glPushMatrix();

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.6,0.0,0.0);

cone(1.3,0.8,4,4);

glPopMatrix();

//AKHIR GENTENG

//Kotak 2

glPushMatrix();

glTranslatef(0.0,0.4,0.0);

glScalef(2.2,0.8,2.2);

glColor3f(0.9,0.8,0.8);

kubussolid();

glPopMatrix();

//GENTENG 2

glPushMatrix();

glScalef(0.9,0.9,0.9);

glTranslatef(0.0,0.5,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.6,0.0,0.0);

cone(1.3,0.8,4,4);

glPopMatrix();

//AKHIR GENTENG

//Kotak 3

glPushMatrix();

glTranslatef(0.0,0.8,0.0);

glScalef(1.9,0.8,1.9);

glColor3f(0.9,0.8,0.8);

kubussolid();

glPopMatrix();

//GENTENG 3

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(0.0,1.06,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.6,0.0,0.0);

cone(1.3,0.8,4,4);

glPopMatrix();

//AKHIR GENTENG

//Kotak 4

glPushMatrix();

glTranslatef(0.0,1.08,0.0);

glScalef(1.7,0.8,1.7);

glColor3f(0.9,0.8,0.8);

kubussolid();

glPopMatrix();

//GENTENG 4

glPushMatrix();

glScalef(0.7,0.6,0.7);

glTranslatef(0.0,2.06,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.6,0.0,0.0);

cone(1.3,0.8,4,4);

glPopMatrix();

glPopMatrix();

//AKHIR GENTENG

//AKHIR PAGODA

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

//LAMPU LALU LINTAS

glPushMatrix();

glTranslatef(0.33,-0.7,0.0);

glScalef(0.2,0.2,0.2);

glPushMatrix();

glScalef(2.0,1.5,1.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn3);

glEnable(GL\_CLIP\_PLANE1);

torussolid(0.04,0.8,20,30);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

//TIANG 1

glPushMatrix();

glTranslatef(1.59,-0.8,0.0);

glScalef(0.2,5.0,0.2);

glRotatef(90.0,1.0,0.0,0.0);

torussolid(0.2,0.2,20,20);

glPopMatrix();

//TIANG 1

//TIANG 2

glPushMatrix();

glTranslatef(-1.59,-0.8,0.0);

glScalef(0.2,5.0,0.2);

glRotatef(90.0,1.0,0.0,0.0);

torussolid(0.2,0.2,20,20);

glPopMatrix();

//TIANG 2

//BILLBOARD

glPushMatrix();

glTranslatef(0.0,0.3,0.0);

glScalef(4.0,1.0,0.5);

glColor3f(0.3,0.3,0.3);

kubussolid();

glPopMatrix();

//AKHIR BILLBOARD

//GANTUNGAN

glPushMatrix();

glTranslatef(0.6,0.6,0.0);

glScalef(0.2,2.0,0.2);

kubussolid();

glPopMatrix();

glPushMatrix();

glTranslatef(-0.6,0.6,0.0);

glScalef(0.2,2.0,0.2);

kubussolid();

glPopMatrix();

//AKHIR GANTUNGAN

glPopMatrix();

//LAMPU MERAH

glPushMatrix();

glTranslatef(0.2,-0.64,0.0);

glScalef(0.08,0.08,0.08);

glColor3f(1.0,0.0,0.0);

bolasolid(0.5,30,30);

glPopMatrix();

//AKHIR LAMPU MERAH

//LAMPU KUNING

glPushMatrix();

glTranslatef(0.33,-0.64,0.0);

glScalef(0.08,0.08,0.08);

glColor3f(0.8,0.8,0.0);

bolasolid(0.5,30,30);

glPopMatrix();

//AKHIR LAMPU KUNING

//LAMPU HIJAU

glPushMatrix();

glTranslatef(0.45,-0.64,0.0);

glScalef(0.08,0.08,0.08);

glColor3f(0.0,1.0,0.0);

bolasolid(0.5,30,30);

glPopMatrix();

//AKHIR LAMPU HIJAU

//AKHIR LAMPU LALU LINTAS

//MONAS

glPushMatrix();

glTranslatef(-3.5,-0.45,-4.5);

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

//TUGU 1

glPushMatrix();

glRotatef(45.0,0.0,1.0,0.0);

glPushMatrix();

glClipPlane(GL\_CLIP\_PLANE1,eqn3);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(0.5,0.5,0.5);

glScalef(0.65,1.0,0.65);

glRotatef(-90.0,1.0,0.0,0.0);

cone(0.5,3.0,4,1);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

//Monas Tingkat 2

glPushMatrix();

glRotatef(180.0,1.0,0.0,0);

glColor3f(0.5,0.5,0.5);

glScalef(1.5,0.6,1.5);

glTranslatef(0.0,-0.2,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

cone(0.7,1,4,1);

glPopMatrix();

//OBOR

glPushMatrix();

glColor3f(1.3,0.2,0.4);

glTranslatef(0.0,2.66,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

cone(0.1,0.3,4,1);

glPopMatrix();

glPopMatrix();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

//KOTAK

for (float i=0; i<5; i++)

{

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,-0.36+(-i/25),0.0);

glScalef(2.5+(i/5),0.1,2.5+(i/5));

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

}

//AKHIR KOTAK

//KOTAK penutup

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,0.1,0.0);

glScalef(3.0,0.15,3.0);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//AKHIR KOTAK

//KOTAK5

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,2.7,0.0);

glScalef(0.35,0.1,0.35);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,2.65,0.0);

glScalef(0.37,0.11,0.37);

kubussolid();

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//AKHIR KOTAK

glPopMatrix();

//AKHIR MONAS

//KACA MINIATUR

glPushMatrix();

//glMaterialfv(GL\_FRONT, GL\_EMISSION, mat\_zero);

//glMaterialfv(GL\_FRONT, GL\_DIFFUSE, mat\_solid);

glColor3f(0.1,0.1,0.8);

//glMaterialfv(GL\_FRONT, GL\_EMISSION, mat\_emission);

//glMaterialfv(GL\_FRONT, GL\_DIFFUSE, mat\_transparent);

glEnable(GL\_BLEND);

glDepthMask(GL\_TRUE);

glBlendFunc(GL\_SRC\_ALPHA, GL\_ONE);

glTranslatef(0.0,1.2,-0.6);

glScalef(18.0,9.5,22.0);

kubussolid();

glDisable(GL\_BLEND);

glPopMatrix();

//KACA MINIATUR

//BALON GAS

glPushMatrix();

glRotatef(lama2,0.0,1.0,0.0);glTranslatef(-2,0.0,0.0);

glPushMatrix();

glTranslatef(0.0,2.0,0.0);glRotatef(lama1,0.0,1.0,0.2);

glPushMatrix();

glColor3f(0.0,0.2,0.4);

glTranslatef(0.0,1.0,0.0);

//BOLA ATAS

glPushMatrix();

glClipPlane(GL\_CLIP\_PLANE1,eqn3);

glEnable(GL\_CLIP\_PLANE1);

glScalef(1.0,1.2,1.0);

glRotatef(90.0,1.0,0.0,0);

bolasolid(0.499,20,20);

glColor3f(0.1,0.1,0.1);

bola();

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

//AKHIR BOLA ATAS

//KERUCUT

glPushMatrix();

glColor3f(0.1,0.1,0.1);

glRotatef(90.0,1.0,0.0,0.0);

wirecone(0.5,1.0,20,20);

glColor3f(0.0,0.2,0.4);

cone(0.499,1.0,20,20);

glPopMatrix();

//AKHIR KERUCUT

glPopMatrix();

//LINGKAR BAWAH

glPushMatrix();

glColor3f(0.5,0.5,0.0);

glTranslatef(0.0,0.2,0.0);

glScalef(0.15,0.1,0.15);

glRotatef(90.0,1.0,0.0,0.0);

torus(0.5,0.6,20,20);

glPopMatrix();

//AKHIR LINGKAR BAWAH

//TALI

glPushMatrix();

glTranslatef(0.0,0.0,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glScalef(0.5,0.5,0.5);

glColor3f(0.0,0.0,0.0);

wirecone(0.5,1.0,4,4);

glPopMatrix();

//AKHIR TALI

//RUANG

glPushMatrix();

glTranslatef(0.0,-0.18,0.0);

glScalef(0.7,0.7,0.7);

glColor3f(0.5,0.5,0.0);

kubussolid();

glColor3f(0.0,0.0,0.0);

kubus();

glPopMatrix();

//AKHIR RUANG

glPopMatrix();

glPopMatrix();

glPopMatrix();

//AKHIR BALON GAS

glPushMatrix();

glTranslatef(0.8,-0.8,1.3);

glPushMatrix();

glTranslatef(pindahx,pindahz,pindahy);

glRotatef(putary,0.0,1.0,0.0);

glPushMatrix();

glScalef(0.2,0.2,0.2);

glRotatef(90.0,0.0,1.0,0.0);

//BADAN MOBIL

glPushMatrix();

glTranslatef(0.0,-0.135,0.0);

glScalef(3.0,1.47,2.0);

glColor3f(0.2,0.5,0.5);

kubussolid();

glColor3f(0.8,0.8,0.8);

kubus();

glPopMatrix();

//AKHIR BADAN MOBIL

//KAP MOBIL

glPushMatrix();

glTranslatef(-1.13,-0.25,0.0);

glScalef(1.5,1.0,2.0);

glColor3f(0.0,0.0,0.0);

kubussolid();

glPopMatrix();

//AKHIR KAP MOBIL

//JENDELA DEPAN

glMaterialfv(GL\_FRONT, GL\_EMISSION, mat\_zero);

glMaterialfv(GL\_FRONT, GL\_DIFFUSE, mat\_solid);

glPushMatrix();glColor3f(0.2,0.0,1.0);

glMaterialfv(GL\_FRONT, GL\_EMISSION, mat\_emission);

glMaterialfv(GL\_FRONT, GL\_DIFFUSE, mat\_transparent);

glEnable(GL\_BLEND);

glDepthMask(GL\_TRUE);

glBlendFunc(GL\_SRC\_ALPHA, GL\_ONE);

glTranslatef(-0.75,0.0,0.0);

glScalef(0.8,0.7,2.0);

glRotatef(45,0.0,0.0,1.0);

kubussolid();

glDisable(GL\_BLEND);

glPopMatrix();

//AKHIR JENDELA

//RODA KIRI DEPAN

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(-1.4,-0.6,0.65);

glColor3f(0.5,0.5,0.5);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KIRI DEPAN

//RODA KANAN DEPAN

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(-1.4,-0.6,-0.65);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KANAN DEPAN

//RODA KIRI BELAKANG

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(0.4,-0.6,0.65);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KIRI BELAKANG

//RODA KANAN BELAKANG

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(0.4,-0.6,-0.65);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KANAN BELAKANG

//RODA CADANGAN

glPushMatrix();

glTranslatef(0.85,-0.15,0.0);

glRotatef(90.0,0.0,1.0,0.0);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA CADANGAN

//LAMPU KIRI

glPushMatrix();

glTranslatef(-1.5,-0.25,0.3);

glScalef(0.1,0.2,0.2);

glColor3f(0.8,0.8,0.8);

bolasolid(0.5,20,20);

glPopMatrix();

//AKHIR LAMPU KIRI

//LAMPU KANAN

glPushMatrix();

glTranslatef(-1.5,-0.25,-0.3);

glScalef(0.1,0.2,0.2);

glColor3f(0.8,0.8,0.8);

bolasolid(0.5,20,20);

glPopMatrix();

//AKHIR LAMPU KANAN

glPopMatrix();

glPopMatrix();

glPopMatrix();

//MOBIL BANYAK

for (float i=0;i<2; i++)

{

for (float j=0; j<4; j++)

{

glPushMatrix();

glTranslatef(0.2+(i/5),-0.92,-0.2-(j/3));

glRotatef(90.0,0.0,1.0,0.0);

glScalef(0.1,0.1,0.1);

//BADAN MOBIL

glPushMatrix();

glTranslatef(0.0,-0.135,0.0);

glScalef(3.0,1.47,2.0);

glColor3f(0.4+((i/5)/(j/8)),0.4+(j/5),0.4+(i/10));

kubussolid();

glColor3f(0.8,0.8,0.8);

kubus();

glPopMatrix();

//AKHIR BADAN MOBIL

//KAP MOBIL

glPushMatrix();

glTranslatef(-1.13,-0.25,0.0);

glScalef(1.5,1.0,2.0);

glColor3f(0.4,0.4+(j/9),0.4+(i/10));

kubussolid();

glPopMatrix();

//AKHIR KAP MOBIL

//JENDELA DEPAN

glPushMatrix();

glMaterialfv(GL\_FRONT, GL\_EMISSION, mat\_zero);

glMaterialfv(GL\_FRONT, GL\_DIFFUSE, mat\_solid);glColor3f(0.1,0.1,1.0);

//glMaterialfv(GL\_FRONT, GL\_EMISSION, mat\_emission);

glMaterialfv(GL\_FRONT, GL\_DIFFUSE, mat\_transparent);

glEnable(GL\_BLEND);

glDepthMask(GL\_TRUE);

glBlendFunc(GL\_SRC\_ALPHA, GL\_ONE);

glTranslatef(-0.75,0.0,0.0);

glScalef(0.8,0.7,2.0);

glRotatef(45,0.0,0.0,1.0);

kubussolid();

glDisable(GL\_BLEND);

glPopMatrix();

//AKHIR JENDELA

//RODA KIRI DEPAN

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(-1.4,-0.6,0.65);

glColor3f(0.5,0.5,0.5);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KIRI DEPAN

//RODA KANAN DEPAN

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(-1.4,-0.6,-0.65);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KANAN DEPAN

//RODA KIRI BELAKANG

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(0.4,-0.6,0.65);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KIRI BELAKANG

//RODA KANAN BELAKANG

glPushMatrix();

glScalef(0.8,0.8,0.8);

glTranslatef(0.4,-0.6,-0.65);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA KANAN BELAKANG

//RODA CADANGAN

glPushMatrix();

glTranslatef(0.85,-0.15,0.0);

glRotatef(90.0,0.0,1.0,0.0);

torussolid(0.1,0.2,20,20);

glPopMatrix();

//AKHIR RODA CADANGAN

//LAMPU KIRI

glPushMatrix();

glTranslatef(-1.5,-0.25,0.3);

glScalef(0.1,0.2,0.2);

glColor3f(0.8,0.8,0.8);

bolasolid(0.5,20,20);

glPopMatrix();

//AKHIR LAMPU KIRI

//LAMPU KANAN

glPushMatrix();

glTranslatef(-1.5,-0.25,-0.3);

glScalef(0.1,0.2,0.2);

glColor3f(0.8,0.8,0.8);

bolasolid(0.5,20,20);

glPopMatrix();

//AKHIR LAMPU KANAN

glPopMatrix();

glPopMatrix();

}

}

//AKHIR MOBIL BANYAK

//AWAL PARABOLA

glPushMatrix();

glTranslatef(1.0,0.1,0.0);

glScalef(0.5,0.5,0.5);

glPushMatrix();

glRotatef(lama4,0.0,1.0,0.0);

//PARABOLA

glPushMatrix();

glTranslatef(-0.1,0.65,0.0);

glRotatef(-145.0,0.0,0.0,1.0);

glScalef(1.0,0.4,1.0);

glRotatef(-90.0,1.0,0.0,0.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(0.8,0.8,0.8);

bola();

glScalef(0.98,0.98,0.98);

glColor4f(0.5,0.5,0.2,0.6);

bolasolid(0.5,20,20);

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

glPushMatrix();

glTranslatef(-0.12,0.66,0.0);

glRotatef(-145.0,0.0,0.0,1.0);

glScalef(1.0,0.4,1.0);

glRotatef(-90.0,1.0,0.0,0.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(0.8,0.8,0.8);

bola();

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

//AKHIR PARABOLA

glPopMatrix();

//TIANG PARABOLA

glPushMatrix();

glScalef(0.2,2.0,0.2);

kubussolid();

glPopMatrix();

//AKHIR TIANG PARABOLA

glPopMatrix();

//AWAL PARABOLA

glPushMatrix();

glTranslatef(-1.6,0.5,-0.7);

glScalef(0.5,0.5,0.5);

glPushMatrix();

glRotatef(lama4,0.0,1.0,0.0);

//PARABOLA

glPushMatrix();

glTranslatef(-0.1,0.65,0.0);

glRotatef(-145.0,0.0,0.0,1.0);

glScalef(1.0,0.4,1.0);

glRotatef(-90.0,1.0,0.0,0.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(0.8,0.8,0.8);

bola();

glScalef(0.98,0.98,0.98);

glColor4f(0.5,0.5,0.2,0.6);

bolasolid(0.5,20,20);

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

glPushMatrix();

glTranslatef(-0.12,0.66,0.0);

glRotatef(-145.0,0.0,0.0,1.0);

glScalef(1.0,0.4,1.0);

glRotatef(-90.0,1.0,0.0,0.0);

glClipPlane(GL\_CLIP\_PLANE1,eqn);

glEnable(GL\_CLIP\_PLANE1);

glColor3f(0.8,0.8,0.8);

bola();

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

//AKHIR PARABOLA

glPopMatrix();

//TIANG PARABOLA

glPushMatrix();

glScalef(0.2,2.0,0.2);

kubussolid();

glPopMatrix();

//AKHIR TIANG PARABOLA

glPopMatrix();

//GEDUNG SATE

glPushMatrix();

glScalef(0.7,0.6,0.5);

glTranslatef(0.0,-0.0,-7.5);

for(int i=0; i<=6; i++)

{

for(int j=0; j<3; j++)

{

glPushMatrix();

glTranslatef((i/6.0)\*1.2,-(j/7.0)\*1.5,0.0);

glPushMatrix();

glScalef(0.18,1.75,1.9);

glTranslatef(-11.0,-0.1,0.35);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.2,0.2,0.2);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.62,0.43,1.24);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.66,0.27,1.0);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//jendela kanan

for(int i=0; i<=6; i++)

{

for(int j=0; j<3; j++)

{

glPushMatrix();

glTranslatef((i/6.0)\*1.2,-(j/7.0)\*1.5,0.0);

glPushMatrix();

glScalef(0.18,1.75,1.9);

glTranslatef(6.0,-0.1,0.35);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.2,0.2,0.2);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.62,0.43,1.24);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.66,0.27,1.0);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//jendela kanan

for(int i=0; i<=5; i++)

{

for(int j=0; j<2; j++)

{

glPushMatrix();

glTranslatef((i/6.0)\*1.2,-(j/7.0)\*1.5,0.0);

glPushMatrix();

glScalef(0.18,1.6,1.7);

glTranslatef(-9.5,0.4,0.35);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.2,0.2,0.2);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.62,0.43,1.24);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.66,0.27,1.0);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//jendela kanan

for(int i=0; i<=5; i++)

{

for(int j=0; j<2; j++)

{

glPushMatrix();

glTranslatef((i/6.0)\*1.2,-(j/7.0)\*1.5,0.0);

glPushMatrix();

glScalef(0.18,1.6,1.7);

glTranslatef(5.5,0.4,0.35);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.2,0.2,0.2);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.62,0.43,1.24);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.66,0.27,1.0);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//jendela kanan

for(int i=0; i<=5; i++)

{

for(int j=0; j<2; j++)

{

glPushMatrix();

glTranslatef((i/6.0)\*1.2,-(j/7.0)\*1.5,0.0);

glPushMatrix();

glScalef(0.18,1.6,1.7);

glTranslatef(5.5,0.4,0.35);

glRotatef(-90.0,0.0,1.0,0.0);

glPushMatrix();

glColor3f(0.2,0.2,0.2);

glTranslatef(-0.36,-0.44,0.8);

glScalef(1.62,0.43,1.24);

kubussolid();

glPopMatrix();

//jendela 2.1.1

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.83);

glScalef(1.66,0.27,1.0);

kubussolid();

glPopMatrix();

//jendela 2.1.2

glPushMatrix();

glColor3f(0.7,1.0,0.9);

glTranslatef(-0.36,-0.44,0.77);

glScalef(1.26,0.17,0.07);

kubussolid();

glPopMatrix();

glPopMatrix();

glPopMatrix();

}

}

//ATAP LANTAI 2 KANAN

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(1.5,0.174,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(1.0,0.36,4,7);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//atap ujung kiri

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(-1.5,0.174,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(1.0,0.36,4,7);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

//atap panjang

glPushMatrix();

glClipPlane(GL\_CLIP\_PLANE1,eqn);

glEnable(GL\_CLIP\_PLANE1);

glTranslatef(0.0,0.18,0.0);

glScalef(6.0,1.0,2.0);

glRotatef(45.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

kubussolid();

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

//lagit-langit

glPushMatrix();

glTranslatef(0.0,0.15,0.0);

glScalef(8.8,0.12,2.7);

glColor3f(0.4,0.0,0.0);

kubussolid();

glPopMatrix();

//badan gedung sate

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,-0.25,0.0);

glScalef(8.0,1.7,2.5);

glColor3f(0.9,0.8,0.9);

//glRotatef(45.0,1.0,0.0,0.0);

kubussolid();

glDisable(GL\_CLIP\_PLANE0);

glDisable(GL\_CLIP\_PLANE1);

glPopMatrix();

// akhir gedung lantai 2

//lantai1

//atap ujung kanan

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(1.5,-0.66,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(1.3,0.36,4,7);

glPopMatrix();

//atap ujung kiri

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(-1.5,-0.66,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(1.3,0.36,4,7);

glPopMatrix();

//lagit-langit kiri

glPushMatrix();

glTranslatef(-1.5,-0.69,0.0);

glScalef(3.63,0.12,3.68);

glColor3f(0.4,0.0,0.0);

kubussolid();

glPopMatrix();

//lagit-langit kanan

glPushMatrix();

glTranslatef(1.5,-0.69,0.0);

glScalef(3.63,0.12,3.68);

glColor3f(0.4,0.0,0.0);

kubussolid();

glPopMatrix();

//badan gedung sate kiri

glPushMatrix();

glTranslatef(-1.42,-1.19,0.0);

glScalef(3.3,1.9,3.0);

glColor3f(0.9,0.8,0.9);

kubussolid();

glPopMatrix();

// akhir gedung lantai 1

//badan gedung sate kanan

glPushMatrix();

glTranslatef(1.42,-1.19,0.0);

glScalef(3.3,1.9,3.0);

glColor3f(0.9,0.8,0.9);

kubussolid();

glPopMatrix();

// akhir gedung lantai 1

//badan gedung sate tengah

glPushMatrix();

glTranslatef(0.0,-0.47,0.0);

glScalef(2.38,4.8,3.0);

glColor3f(0.9,0.8,0.9);

kubussolid();

glPopMatrix();

// akhir gedung lantai 1

//badan gedung lantai 3

glPushMatrix();

glTranslatef(0.0,0.85,0.0);

glScalef(1.8,0.6,1.8);

glColor3f(0.9,0.8,0.9);

kubussolid();

glPopMatrix();

// akhir gedung lantai 1

//genteng atas 1

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,1.0,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(0.8,0.36,4,7);

glPopMatrix();

//genteng atas 2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,1.15,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(0.7,0.36,4,7);

glPopMatrix();

//genteng atas 2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,1.3,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(0.6,0.36,4,7);

glPopMatrix();

//genteng lantai bawah tengah

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,-1.0,0.5);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(1.0,0.3,4,7);

glPopMatrix();

//genteng lantai bawah tengah

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,1.6,0.0);

glRotatef(45.0,0.0,1.0,0.0);

glRotatef(-90.0,1.0,0.0,0.0);

glColor3f(0.4,0.0,0.0);

cone(0.05,0.5,3,7);

glPopMatrix();

//langit2 gedung lantai 1 tengah

glPushMatrix();

glTranslatef(0.0,-1.035,0.75);

glScalef(2.8,0.15,1.8);

glColor3f(0.4,0.0,0.0);

kubussolid();

glPopMatrix();

// akhir gedung lantai 1

//jendela

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,-0.3,0.02);

glScalef(0.7,1.0,3.0);

glColor3f(0.0,0.8,0.9);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

kubussolid();

glPopMatrix();

//jendela2

glPushMatrix();

glEnable(GL\_LIGHTING);

glEnable(GL\_LIGHT0);

glTranslatef(0.0,-0.05,0.01);

glRotatef(45,0,0,1);

glScalef(0.5,0.5,3.0);

glColor3f(0.0,0.8,0.8);

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

kubussolid();

glPopMatrix();

// akhir gedung lantai 1

//badan gedung lantai 1 tengah

glPushMatrix();

glTranslatef(0.0,-1.335,0.75);

glScalef(2.0,1.3,1.0);

glColor3f(0.9,0.8,0.9);

kubussolid();

glPopMatrix();

// akhir gedung lantai 1

glDisable(GL\_LIGHTING);

glDisable(GL\_LIGHT0);

glPopMatrix();

glFlush();

glutSwapBuffers();

angle++;

}

//FUNGSI KEYBOARD

void keyboard (unsigned char key, int x, int y)

{

float detik = 1000.0;

const double time = glutGet(GLUT\_ELAPSED\_TIME) / detik;

switch (key){

case 'w':

case 'W':

xrot += 1;

if (xrot >360)

xrot -= 360;

break;

case 's':

case 'S':

xrot -= 1;

if (xrot < -360)

xrot += 360;

break;

case 'a':

case 'A':

yrot += 1;

if (yrot >360)

yrot -= 360;

break;

case 'd':

case 'D':

yrot -= 1;

if (yrot < -360)

yrot += 360;

//case 'q':

//case 'Q':

break;

case 'f':

case 'F':

putary -= 90;

if (putary < -360)

putary += 360;

break;

case 'h':

case 'H':

putary += 90;

if (putary >360)

putary -= 360;

break;

case 27:

//glutLeaveGameMode();

exit (0);

}

}

void mouse(int klik, int state, int xx, int yy)

{

switch(klik){

case GLUT\_LEFT\_BUTTON:

if((putary==-270)||(putary==90))

{

pindahx +=0.1f;

}

if((putary==180)||(putary==-180))

{

pindahy -=0.1f;

}

if((putary==-90)||(putary==270))

{

pindahx -=0.1f;

}

if((putary==0) || (putary==360) || (putary==-360))

{

pindahy +=0.1f;

}

}

}

void ketik(int key, int xx, int yy)

{

int mod;

float fraksi = 0.1f;

switch(key){

case GLUT\_KEY\_F1:

mod = glutGetModifiers();

if(mod == (GLUT\_ACTIVE\_ALT)){

sumbux=1.0;

sumbuy=0.0;

sumbuz=0.0;

}

break;

case GLUT\_KEY\_F2:

sumbux=0.0;

sumbuy=1.0;

sumbuz=0.0;

break;

case GLUT\_KEY\_F3:

sumbux=0.0;

sumbuy=0.0;

sumbuz=1.0;

break;

case GLUT\_KEY\_LEFT:

sudut -=0.01f;

vektorx = sin(sudut);

vektorz = -cos(sudut);

break;

case GLUT\_KEY\_RIGHT:

sudut += 0.01f;

vektorx = sin(sudut);

vektorz = -cos(sudut);

break;

case GLUT\_KEY\_UP:

x += vektorx \* fraksi;

z += vektorz \* fraksi;

break;

case GLUT\_KEY\_DOWN:

x -= vektorx \* fraksi;

z -= vektorz \* fraksi;

break;

case GLUT\_KEY\_PAGE\_UP:

xrot += 1;

if (xrot >360)

xrot -= 360;

break;

case GLUT\_KEY\_PAGE\_DOWN:

xrot -= 1;

if (xrot < -360)

xrot += 360;

break;

case GLUT\_KEY\_HOME:

yrot -= 1;

if (yrot < -360)

yrot += 360;

break;

case GLUT\_KEY\_END:

yrot += 1;

if (yrot >360)

yrot -= 360;

}

}

int main(int argc, char \*\*argv)

{

glutInit(&argc, argv);

glutInitDisplayMode (GLUT\_DOUBLE | GLUT\_RGB | GLUT\_DEPTH);

//glutGameModeString( "1024×768:32@75" ); //the settings for fullscreen mode

//glutEnterGameMode(); //set glut to fullscreen using the settings in the line above

glutInitWindowSize(1010,690);

glutInitWindowPosition(0,0);

glutCreateWindow("Program Tugas Besar");

init();

glutDisplayFunc(display);

glutReshapeFunc(bangun);

glutTimerFunc(33, TimerFunction, 1);

glutIdleFunc(display);

glutKeyboardFunc(keyboard);

glutSpecialFunc(ketik);

glutMouseFunc(mouse);

glEnable(GL\_DEPTH\_TEST);

glutMainLoop();

return 0;

}