MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL TECHNICAL UNIVERSITY

“KHARKOV POLYTECHNICAL INSTITUTE”

LABORATORY WORK № 1

# “Individual Project”

Created by student of 1.КН.201.8г

Chukwu Irele Omike

Checked by

KHARKIV 2019

The code :

#include<windows.h>

#ifdef \_\_APPLE\_\_

#include <GLUT/glut.h>

#else

#include <GL/glut.h>

#endif

#include <stdlib.h>

#include <stdio.h>

#include <iostream>

#include <string>

//Game Speed

int FPS = 50;

//Game Track

int start=0;

int gv=0;

int level = 0;

//Track Score

int score = 0;

//Form move track

int roadDivTopMost = 0;

int roadDivTop = 0;

int roadDivMdl = 0;

int roadDivBtm = 0;

//For Card Left / RIGHT

int lrIndex = 0 ;

//Car Coming

int car1 = 0;

int lrIndex1=0;

int car2 = +35;

int lrIndex2=0;

int car3 = +70;

int lrIndex3=0;

//For Display TEXT

const int font1=(int)GLUT\_BITMAP\_TIMES\_ROMAN\_24;

const int font2=(int)GLUT\_BITMAP\_HELVETICA\_18 ;

const int font3=(int)GLUT\_BITMAP\_8\_BY\_13;

char s[30];

void renderBitmapString(float x, float y, void \*font,const char \*string){

const char \*c;

glRasterPos2f(x, y);

for (c=string; \*c != '\0'; c++) {

glutBitmapCharacter(font, \*c);

}

}

void tree(int x, int y){

int newx=x;

int newy=y;

//Tree Left

//Bottom

glColor3f(0.871, 0.722, 0.529);

glBegin(GL\_TRIANGLES);

glVertex2f(newx+11,newy+55);

glVertex2f(newx+12,newy+55-10);

glVertex2f(newx+10,newy+55-10);

glEnd();

//Up

glColor3f(0.133, 0.545, 0.133);

glBegin(GL\_TRIANGLES);

glVertex2f(newx+11,newy+55+3);

glVertex2f(newx+12+3,newy+55-3);

glVertex2f(newx+10-3,newy+55-3);

glEnd();

}

void startGame(){

//Road

glColor3f(0.412, 0.412, 0.412);

glBegin(GL\_POLYGON);

glVertex2f(20,0);

glVertex2f(20,100);

glVertex2f(80,100);

glVertex2f(80,0);

glEnd();

//Road Left Border

glColor3f(1.000, 1.000, 1.000);

glBegin(GL\_POLYGON);

glVertex2f(20,0);

glVertex2f(20,100);

glVertex2f(23,100);

glVertex2f(23,0);

glEnd();

//Road Right Border

glColor3f(1.000, 1.000, 1.000);

glBegin(GL\_POLYGON);

glVertex2f(77,0);

glVertex2f(77,100);

glVertex2f(80,100);

glVertex2f(80,0);

glEnd();

//Road Middel Border

//TOP

glColor3f(1.000, 1.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(48,roadDivTop+80);

glVertex2f(48,roadDivTop+100);

glVertex2f(52,roadDivTop+100);

glVertex2f(52,roadDivTop+80);

glEnd();

roadDivTop--;

if(roadDivTop<-100){

roadDivTop =20;

score++;

}

//Midle

glColor3f(1.000, 1.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(48,roadDivMdl+40);

glVertex2f(48,roadDivMdl+60);

glVertex2f(52,roadDivMdl+60);

glVertex2f(52,roadDivMdl+40);

glEnd();

roadDivMdl--;

if(roadDivMdl<-60){

roadDivMdl =60;

score++;

}

//Bottom

glColor3f(1.000, 1.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(48,roadDivBtm+0);

glVertex2f(48,roadDivBtm+20);

glVertex2f(52,roadDivBtm+20);

glVertex2f(52,roadDivBtm+0);

glEnd();

roadDivBtm--;

if(roadDivBtm<-20){

roadDivBtm=100;

score++;

}

//Score Board

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(80,97);

glVertex2f(100,97);

glVertex2f(100,98-8);

glVertex2f(80,98-8);

glEnd();

//Print Score

char buffer [50];

sprintf (buffer, "SCORE: %d", score);

glColor3f(0.000, 1.000, 0.000);

renderBitmapString(80.5,95,(void \*)font3,buffer);

//Speed Print

char buffer1 [50];

sprintf (buffer1, "SPEED:%dKm/h", FPS);

glColor3f(0.000, 1.000, 0.000);

renderBitmapString(80.5,95-2,(void \*)font3,buffer1);

//level Print

if(score % 50 == 0){

int last = score /50;

if(last!=level){

level = score /50;

FPS=FPS+2;

}

}

char level\_buffer [50];

sprintf (level\_buffer, "LEVEL: %d", level);

glColor3f(0.000, 1.000, 0.000);

renderBitmapString(80.5,95-4,(void \*)font3,level\_buffer);

//Increse Speed With level

//MAIN car

//Front Tire

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex+26-2,5);

glVertex2f(lrIndex+26-2,7);

glVertex2f(lrIndex+30+2,7);

glVertex2f(lrIndex+30+2,5);

glEnd();

//Back Tire

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex+26-2,1);

glVertex2f(lrIndex+26-2,3);

glVertex2f(lrIndex+30+2,3);

glVertex2f(lrIndex+30+2,1);

glEnd();

//Car Body

glColor3f(0.678, 1.000, 0.184);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex+26,1);

glVertex2f(lrIndex+26,8);

glColor3f(0.000, 0.545, 0.545);

glVertex2f(lrIndex+28,10);

glVertex2f(lrIndex+30,8);

glVertex2f(lrIndex+30,1);

glEnd();

//Opposite car 1

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex1+26-2,car1+100-4);

glVertex2f(lrIndex1+26-2,car1+100-6);

glVertex2f(lrIndex1+30+2,car1+100-6);

glVertex2f(lrIndex1+30+2,car1+100-4);

glEnd();

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex1+26-2,car1+100);

glVertex2f(lrIndex1+26-2,car1+100-2);

glVertex2f(lrIndex1+30+2,car1+100-2);

glVertex2f(lrIndex1+30+2,car1+100);

glEnd();

glColor3f(1.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex1+26,car1+100);

glVertex2f(lrIndex1+26,car1+100-7);

glVertex2f(lrIndex1+28,car1+100-9);

glVertex2f(lrIndex1+30,car1+100-7);

glVertex2f(lrIndex1+30,car1+100);

glEnd();

car1--;

if(car1<-100){

car1=0;

lrIndex1=lrIndex;

}

//KIll check car1

if((abs(lrIndex-lrIndex1)<8) && (car1+100<10)){

start = 0;

gv=1;

}

//Opposite car 2

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex2+26-2,car2+100-4);

glVertex2f(lrIndex2+26-2,car2+100-6);

glVertex2f(lrIndex2+30+2,car2+100-6);

glVertex2f(lrIndex2+30+2,car2+100-4);

glEnd();

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex2+26-2,car2+100);

glVertex2f(lrIndex2+26-2,car2+100-2);

glVertex2f(lrIndex2+30+2,car2+100-2);

glVertex2f(lrIndex2+30+2,car2+100);

glEnd();

glColor3f(0.294, 0.000, 0.510);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex2+26,car2+100);

glVertex2f(lrIndex2+26,car2+100-7);

glVertex2f(lrIndex2+28,car2+100-9);

glVertex2f(lrIndex2+30,car2+100-7);

glVertex2f(lrIndex2+30,car2+100);

glEnd();

car2--;

if(car2<-100){

car2=0;

lrIndex2=lrIndex;

}

//KIll check car2

if((abs(lrIndex-lrIndex2)<8) && (car2+100<10)){

start = 0;

gv=1;

}

//Opposite car 3

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex3+26-2,car3+100-4);

glVertex2f(lrIndex3+26-2,car3+100-6);

glVertex2f(lrIndex3+30+2,car3+100-6);

glVertex2f(lrIndex3+30+2,car3+100-4);

glEnd();

glColor3f(0.000, 0.000, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex3+26-2,car3+100);

glVertex2f(lrIndex3+26-2,car3+100-2);

glVertex2f(lrIndex3+30+2,car3+100-2);

glVertex2f(lrIndex3+30+2,car3+100);

glEnd();

glColor3f(1.000, 0.271, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(lrIndex3+26,car3+100);

glVertex2f(lrIndex3+26,car3+100-7);

glVertex2f(lrIndex3+28,car3+100-9);

glVertex2f(lrIndex3+30,car3+100-7);

glVertex2f(lrIndex3+30,car3+100);

glEnd();

car3--;

if(car3<-100){

car3=0;

lrIndex3=lrIndex;

}

//KIll check car3

if((abs(lrIndex-lrIndex3)<8) && (car3+100<10)){

start = 0;

gv=1;

}

}

void fristDesign(){

//Road Backgound

glColor3f(0.000, 0.392, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(0,55);

glVertex2f(100,55);

glColor3f(0.604, 0.804, 0.196);

glVertex2f(100,50-50);

glVertex2f(0,50-50);

glEnd();

//Road Design In Front Page

glColor3f(00, 0, 0);

glBegin(GL\_TRIANGLES);

glVertex2f(32-2+21,55);

glVertex2f(32+58,50-50);

glVertex2f(32-22,50-50);

glEnd();

//Road Midle

glColor3f(1, 1, 1);

glBegin(GL\_TRIANGLES);

glVertex2f(32-2+21,55);

glVertex2f(50+2,50-50);

glVertex2f(50-2,50-50);

glEnd();

//Road Sky

glColor3f(0.000, 0.749, 1.000);

glBegin(GL\_POLYGON);

glVertex2f(100,100);

glVertex2f(0,100);

glColor3f(0.686, 0.933, 0.933);

glVertex2f(0,55);

glVertex2f(100,55);

glEnd();

//Hill 1

glColor3f(0.235, 0.702, 0.443);

glBegin(GL\_TRIANGLES);

glVertex2f(20,55+10);

glVertex2f(20+7,55);

glVertex2f(0,55);

glEnd();

//Hill 2

glColor3f(0.000, 0.502, 0.000);

glBegin(GL\_TRIANGLES);

glVertex2f(20+15,55+12);

glVertex2f(20+20+10,55);

glVertex2f(0+10,55);

glEnd();

//Hill 4

glColor3f(0.235, 0.702, 0.443);

glBegin(GL\_TRIANGLES);

glVertex2f(87,55+10);

glVertex2f(100,55);

glVertex2f(60,55);

glEnd();

//Hill 3

glColor3f(0.000, 0.502, 0.000);

glBegin(GL\_TRIANGLES);

glVertex2f(70,70);

glVertex2f(90,55);

glVertex2f(50,55);

glEnd();

//Tree Left

//Bottom

glColor3f(0.871, 0.722, 0.529);

glBegin(GL\_TRIANGLES);

glVertex2f(11,55);

glVertex2f(12,55-10);

glVertex2f(10,55-10);

glEnd();

//Up

glColor3f(0.133, 0.545, 0.133);

glBegin(GL\_TRIANGLES);

glVertex2f(11,55+3);

glVertex2f(12+3,55-3);

glVertex2f(10-3,55-3);

glEnd();

tree(5,-15);

tree(9,5);

tree(85,9);

tree(75,-5);

//Menu Place Holder

glColor3f(0.098, 0.098, 0.439);

glBegin(GL\_POLYGON);

glVertex2f(32-4,50+5+10);

glVertex2f(32+46,50+5+10);

glVertex2f(32+46,50-15+10);

glVertex2f(32-4,50-15+10);

glEnd();

glColor3f(00, 0, 0.000);

glBegin(GL\_POLYGON);

glVertex2f(32-4,50+5+10);

glVertex2f(32+46,50+5+10);

glVertex2f(32+46,50+4+10);

glVertex2f(32-4,50+4+10);

glEnd();

glBegin(GL\_POLYGON);

glVertex2f(32+45,50+5+10);

glVertex2f(32+46,50+5+10);

glVertex2f(32+46,50-15+10);

glVertex2f(32+45,50-15+10);

glEnd();

glBegin(GL\_POLYGON);

glVertex2f(32-4,50-14+10);

glVertex2f(32+46,50-14+10);

glVertex2f(32+46,50-15+10);

glVertex2f(32-4,50-15+10);

glEnd();

glBegin(GL\_POLYGON);

glVertex2f(32-4,50+5+10);

glVertex2f(32-5,50+5+10);

glVertex2f(32-5,50-15+10);

glVertex2f(32-4,50-15+10);

glEnd();

//Text Information in Frist Page

if(gv==1){

glColor3f(1.000, 0.000, 0.000);

renderBitmapString(35,60+10,(void \*)font1,"GAME OVER");

glColor3f(1.000, 0.000, 0.000);

char buffer2 [50];

sprintf (buffer2, "Your Score is : %d", score);

renderBitmapString(33,60-4+10,(void \*)font1,buffer2);

}

glColor3f(1.000, 1.000, 0.000);

renderBitmapString(30,80,(void \*)font1,"2D Car Racing Game ");

glColor3f(0.000, 1.000, 0.000);

renderBitmapString(30,50+10,(void \*)font2,"Press SPACE to START");

renderBitmapString(30,50-3+10,(void \*)font2,"Press ESC to Exit");

glColor3f(1.000, 1.000, 1.000);

renderBitmapString(30,50-6+10,(void \*)font3,"Press UP to increase Speed");

renderBitmapString(30,50-8+10,(void \*)font3,"Press DWON to decrease Speed");

renderBitmapString(30,50-10+10,(void \*)font3,"Press RIGHT to turn Right");

renderBitmapString(30,50-12+10,(void \*)font3,"Press LEFT to turn Left");

glColor3f(0.000, 1.000, 1.000);

renderBitmapString(30-5,50-40,(void \*)font3,"Project By:");

renderBitmapString(30-5,50-43,(void \*)font3,"Zunaid Mahdi");

}

void display(){

glClear(GL\_COLOR\_BUFFER\_BIT);

if(start==1){

// glClearColor(0.627, 0.322, 0.176,1);

glClearColor(0.000, 0.392, 0.000,1);

startGame();

}

else{

fristDesign();

//glClearColor(0.184, 0.310, 0.310,1);

}

glFlush();

glutSwapBuffers();

}

void spe\_key(int key, int x, int y){

switch (key) {

case GLUT\_KEY\_DOWN:

if(FPS>(50+(level\*2)))

FPS=FPS-2;

break;

case GLUT\_KEY\_UP:

FPS=FPS+2;

break;

case GLUT\_KEY\_LEFT:

if(lrIndex>=0){

lrIndex = lrIndex - (FPS/10);

if(lrIndex<0){

lrIndex=-1;

}

}

break;

case GLUT\_KEY\_RIGHT:

if(lrIndex<=44){

lrIndex = lrIndex + (FPS/10);

if(lrIndex>44){

lrIndex = 45;

}

}

break;

default:

break;

}

}

void processKeys(unsigned char key, int x, int y) {

switch (key)

{

case ' ':

if(start==0){

start = 1;

gv = 0;

FPS = 50;

roadDivTopMost = 0;

roadDivTop = 0;

roadDivMdl = 0;

roadDivBtm = 0;

lrIndex = 0 ;

car1 = 0;

lrIndex1=0;

car2 = +35;

lrIndex2=0;

car3 = +70;

lrIndex3=0;

score=0;

level=0;

}

break;

case 27:

exit(0);

break;

default:

break;

}

}

void timer(int){

glutPostRedisplay();

glutTimerFunc(1000/FPS,timer,0);

}

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

{

glutInit(&argc, argv);

glutInitDisplayMode(GLUT\_RGB | GLUT\_DOUBLE);

glutInitWindowSize(500,650);

glutInitWindowPosition(200,20);

glutCreateWindow("Car Game");

glutDisplayFunc(display);

glutSpecialFunc(spe\_key);

glutKeyboardFunc(processKeys );

glOrtho(0,100,0,100,-1,1);

glClearColor(0.184, 0.310, 0.310,1);

glutTimerFunc(1000,timer,0);

glutMainLoop();

return 0;

}

Execution:

