Assignment 2

#include "mainwindow.h"

#include "ui\_mainwindow.h"

#include "math.h"

QImage img(300,300,QImage::Format\_RGB888);

MainWindow::MainWindow(QWidget \*parent) :

QMainWindow(parent),

ui(new Ui::MainWindow)

{

ui->setupUi(this);

}

MainWindow::~*MainWindow*()

{

delete ui;

}

void MainWindow::on\_pushButton\_3\_clicked()

{

// dda line

float x1,y1,x2,y2;

x1 = ui -> textEdit->toPlainText().toFloat();

y1 = ui -> textEdit\_2->toPlainText().toFloat();

x2 = ui -> textEdit\_3->toPlainText().toFloat();

y2 = ui -> textEdit\_4->toPlainText().toFloat();

dda\_line(x1,y1,x2,y2);

}

void MainWindow::dda\_line(float x1, float y1, float x2, float y2)

{

float dx,dy,len,x,y,i;

dx = x2-x1;

dy = y2-y1;

if(abs(dx)>=abs(dy))

len = abs(dx);

else

len = abs(dy);

dx = dx/len;

dy = dy/len;

x = x1 + 0.5 \* sign(x2-x1);

y = y1 + 0.5 \* sign(y2-y1);

while (i<=len) {

img.setPixel(x,y,qRgb(255,0,0));

x = x + dx;

y = y + dy;

i = i + 1;

}

ui->label->setPixmap(QPixmap::fromImage(img));

}

void MainWindow::on\_pushButton\_clicked()

{

//bresenham circle

float xc,yc,r;

xc = ui -> textEdit->toPlainText().toInt();

yc = ui -> textEdit\_2->toPlainText().toInt();

r = ui -> textEdit\_3->toPlainText().toInt();

bresenhamc(xc,yc,r);

}

void MainWindow :: bresenhamc(float xc,float yc, float r)

{

float x,y,d;

x = 0;

y = r;

d = 3-2\*r;

while(x<=y)

{

img.setPixel(xc+x, yc+y, qRgb(0,255,0));

img.setPixel(xc-x, yc+y, qRgb(0,255,0));

img.setPixel(xc+x, yc-y, qRgb(0,255,0));

img.setPixel(xc-x, yc-y, qRgb(0,255,0));

img.setPixel(xc+y, yc+x, qRgb(0,255,0));

img.setPixel(xc-y, yc+x, qRgb(0,255,0));

img.setPixel(xc+y, yc-x, qRgb(0,255,0));

img.setPixel(xc-y, yc-x, qRgb(0,255,0));

if(d<0)

{

d = d+4\*x+6;

}

else

{

d = d+4\*(x-y)+10;

y =y-1;

}

x = x+1;

}

ui->label->setPixmap(QPixmap::fromImage(img));

}

void MainWindow::on\_pushButton\_2\_clicked()

{

float xc,yc,r;

xc = ui -> textEdit->toPlainText().toInt();

yc = ui -> textEdit\_2->toPlainText().toInt();

r = ui -> textEdit\_3->toPlainText().toInt();

ddac(xc,yc,r);

}

void MainWindow :: ddac(float xc, float yc, float r)

{

float xc1,xc2,yc1,yc2,eps,sx,sy;

int val,i;

xc1=r;

yc1=0;

sx=xc1;

sy=yc1;

i=0;

do{

val=pow(2,i);

i++;

}while(val<r);

eps = 1/pow(2,i-1);

do{

xc2 = xc1 + yc1\*eps;

yc2 = yc1 - eps\*xc2;

img.setPixel(xc+xc2,yc-yc2,qRgb(0,255,255));

xc1=xc2;

yc1=yc2;

}while((yc1-sy)<eps || (sx-xc1)>eps);

ui->label->setPixmap(QPixmap::fromImage(img));

}

float MainWindow::sign(float p)

{

if(p<0)

return -1;

else

return 1;

}

