Министерство образования и науки Российской Федерации

Федеральное государственное образовательное учреждение высшего профессионального образования

«ВОЛГОГРАДСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИСТЕТ»

(ВолгГТУ)

Факультет Электроники и вычислительной техники

Кафедра ««САПР и ПК»»

Курсовая работа
На тему: «Графический редактор».

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Содержание

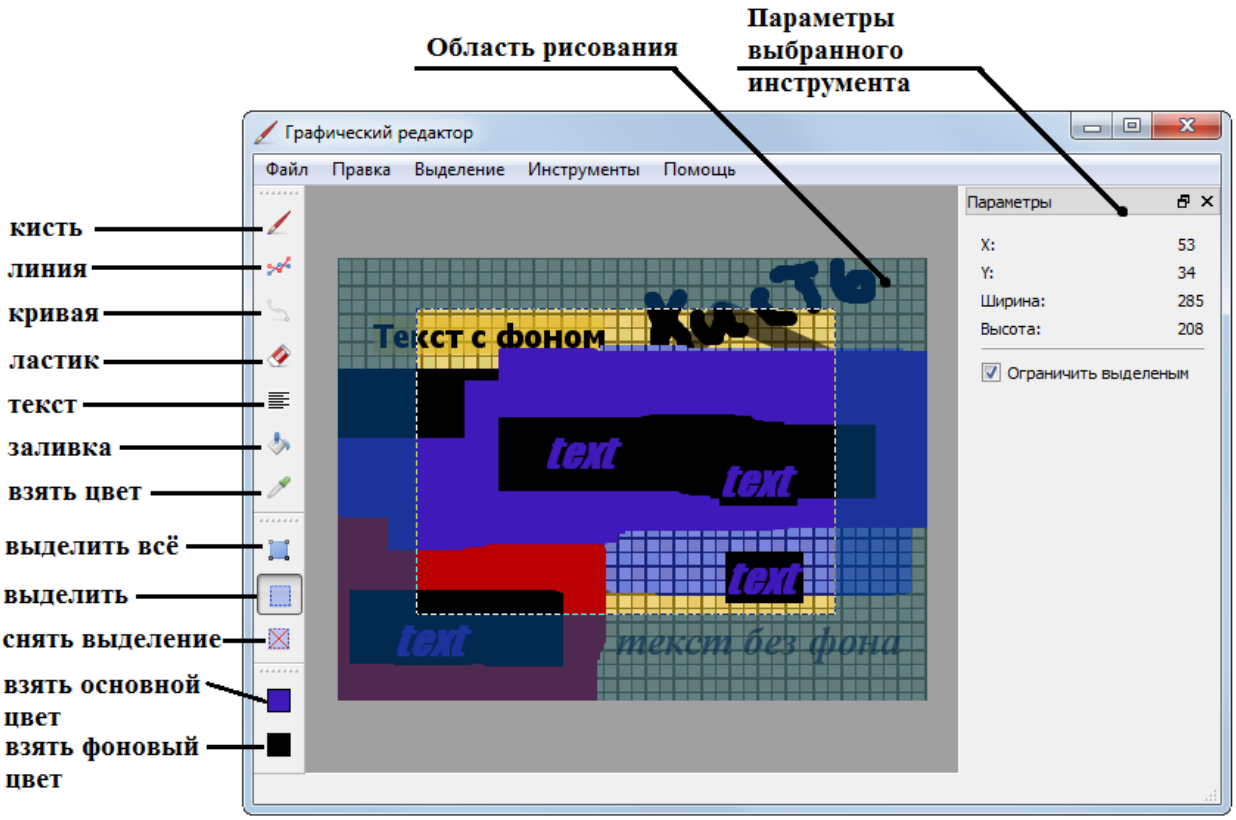
Постановка задачи

Реализовать программу «Графический редактор».

Функции

1) Создание изображений;
2) Открытие изображений;
3) Сахранение изображений;
4) Печать изображений;
5) Вставка и копирование изображений (буфер обмена)
6) Выделение области
7) Поддержка инструментов:
    a) Кисть
    b) Линия
    c) Кривая
    d) Ластик
    e) Заливка
    f) Текст
    g) Взять цвет

Проектирование интерфейса (с точки пользователя)



Проектирование интерфейса (с точки разработчика)

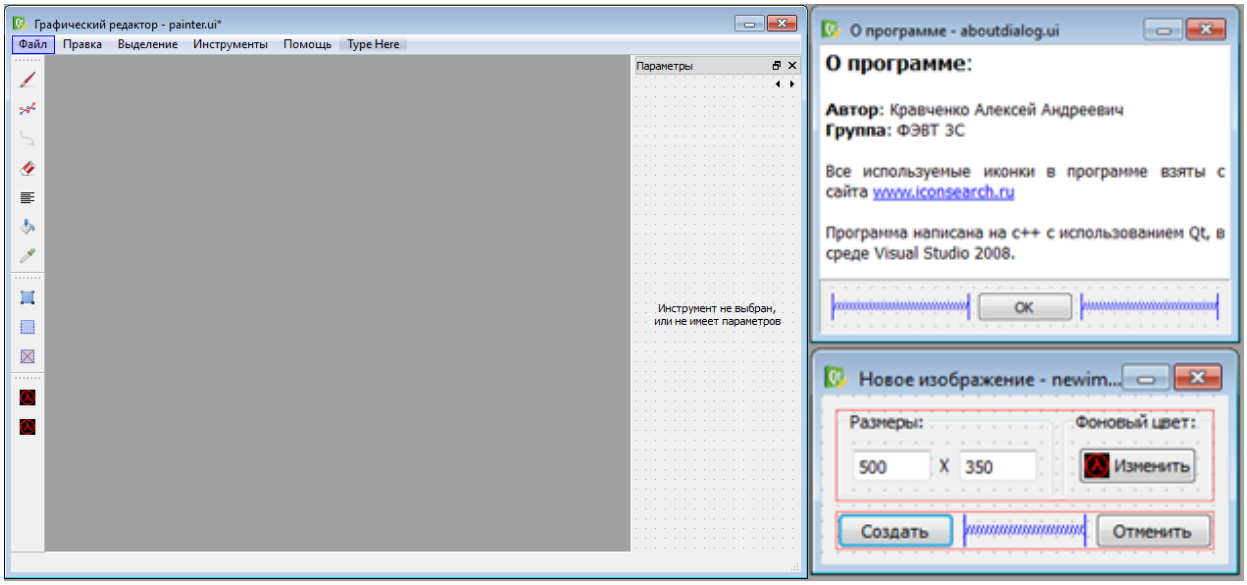


Рисунок - Основные формы

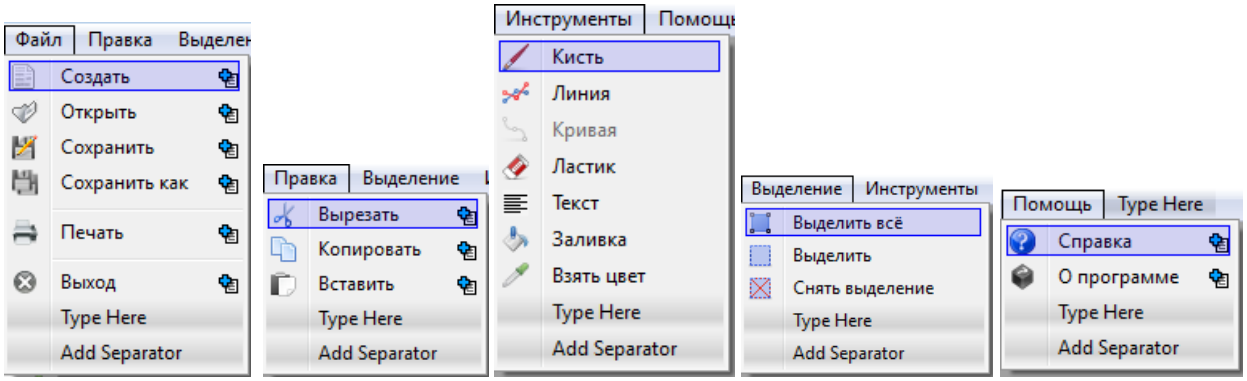


Рисунок - Главное меню

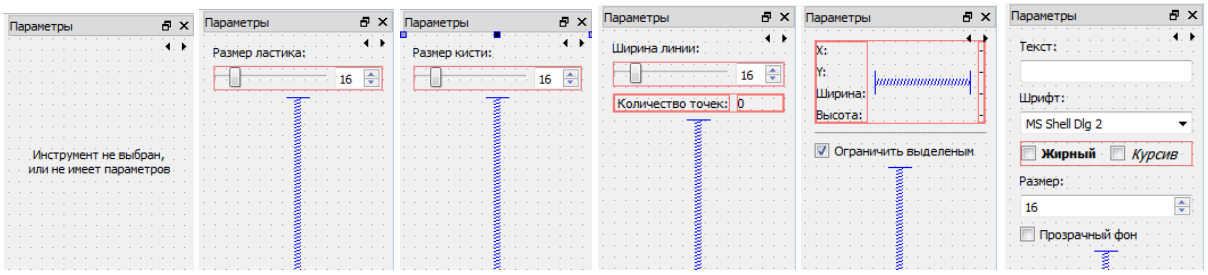
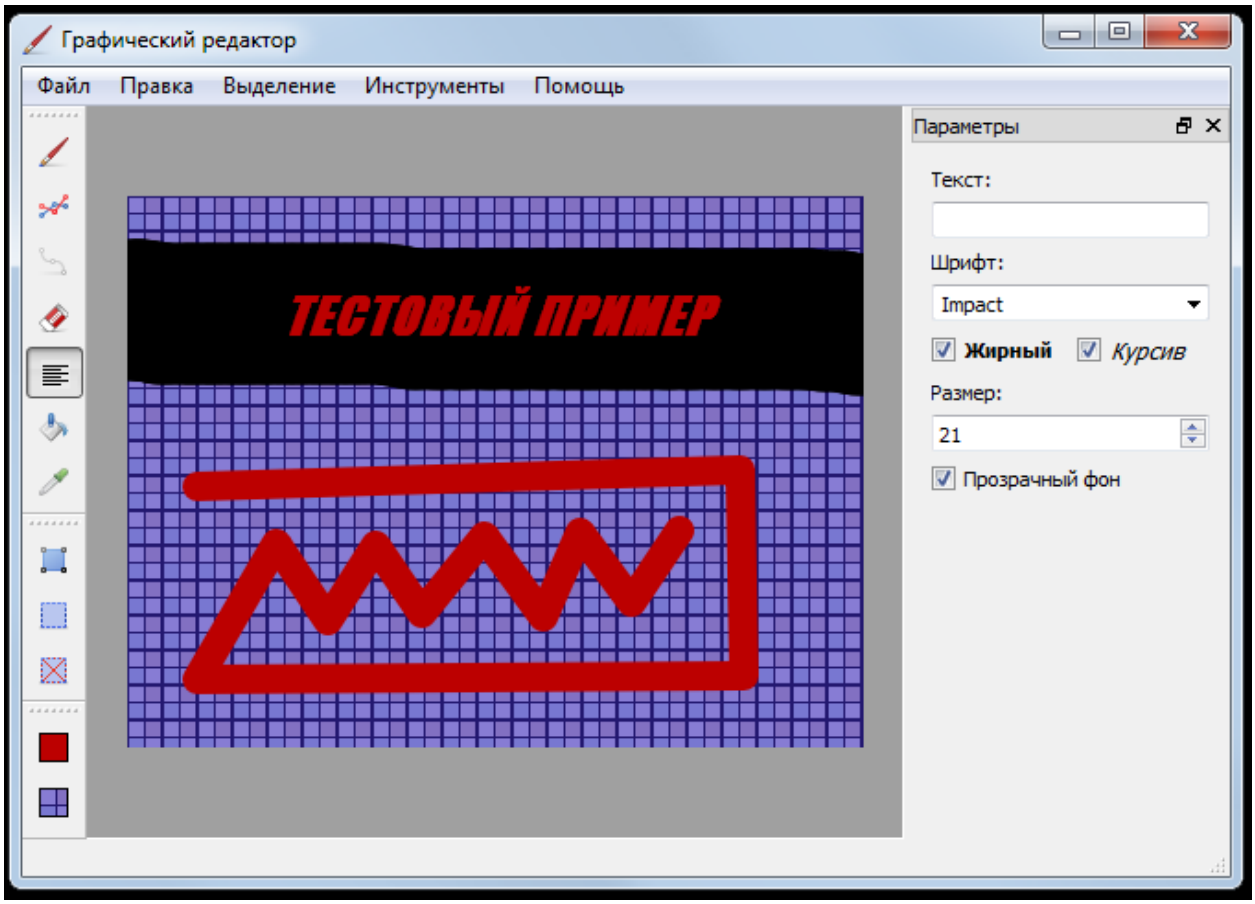


Рисунок - Стек виджет

Тестовый пример



Листинг

main.cpp

```
#include "stdafx.h"
#include "painter.h"
#include <QtGui/QApplication>

int main(int argc, char *argv[])
{
	QTextCodec::setCodecForCStrings(QTextCodec::codecForName("Windows-
1251"));

	QApplication a(argc, argv);

	//Указываем деректорию для плагинов
	QStringList list_path;
	QDir dir =QDir(a.applicationDirPath()+"//plugins//");
	list_path << dir.absolutePath() << a.libraryPaths();
	a.setLibraryPaths(list_path);
	//---------------------------------

	Painter w;
	w.show();
	return a.exec();
}
```

painter.h

```
#ifndef PAINTER_H
#define PAINTER_H

#include <QtGui/QMainWindow>
#include <QActionGroup>
#include <QClipboard>

#include "ui_painter.h"

#include "canvas.h"
#include "newimagedialog.h"
#include "aboutdialog.h"
#include "actioncolors.h"

class AbstractTool;

class BrushTool;
class LineTool;
class CurveTool;
class EraserTool;
class TextTool;
class FillTool;
class TakeColorTool;
class SelectTool;
class ImageTool;

class Painter : public QMainWindow
{
	Q_OBJECT

public:
	Painter(QWidget *parent = 0, Qt::WFlags flags = 0);
	~Painter();

	ActionColors* colors;

	Canvas *canvas;
	Ui::PainterClass ui;

	QActionGroup *groupActionTool;

	//Инструменты
	BrushTool* brushTool;
	LineTool* lineTool;
	CurveTool* curveTool;
	EraserTool* eraserTool;
	TextTool* textTool;
	FillTool* fillTool;
	TakeColorTool* takeColorTool;

	SelectTool* selectTool;
	ImageTool* imageTool;

private:
	QString currentFileName;

private slots:
	void onNewFileClicked();
	void onOpenFileClicked();
	void onSaveFileClicked();
	void onSaveAsFileClicked();
```

```
	void printDocument(QPrinter*);
	void onPrintClicked();

	void onAboutClicked();

	void onCopyClicked();
	void onPasteClicked();
	void onCutClicked();

	void onSelectAllClicked();
	void onDeselectClicked();

	void selectFgColor();
	void selectBgColor();
	void changeColors(int, const QColor&);

	void selectedTool(QAction* action);

	void onRestrictSelection(bool state);

	void changeSA();
};

#endif // PAINTER_H
```

painter.cpp

```
#include "stdafx.h"
#include "painter.h"

#include "abstracttool.h"

#include "brushtool.h"
#include "linetool.h"
#include "curvetool.h"
#include "erasertool.h"
#include "texttool.h"
#include "filltool.h"
#include "takecolortool.h"
#include "selecttool.h"
#include "imagetool.h"

Q_DECLARE_METATYPE(AbstractTool*);

Painter::Painter(QWidget *parent, Qt::WFlags flags)
	: QMainWindow(parent, flags)
{
	ui.setupUi(this);

	//создание области рисования
	canvas = new Canvas(this);
	ui.canvasLayout->addWidget(canvas);
	canvas->newImage(QColor(Qt::white), QSize(500, 350));

	//при изменение области выделения на канвасе
	connect(canvas, SIGNAL(changeSA()), this, SLOT(changeSA()));

	//инициализация и установка цвета по умолчанию
	colors = new ActionColors(this);
	connect(colors, SIGNAL(changeColors(int, const QColor&)), this,
SLOT(changeColors(int, const QColor&)));
```

```
	colors->setFG(Qt::black);
	colors->setBG(Qt::white);

	//создание и назначение инструментов
	brushTool = new BrushTool(canvas, ui.pageBrushTool, &ui, colors);
	ui.actionBrush->setData(QVariant::fromValue<AbstractTool*>(brushTool));

	lineTool = new LineTool(canvas, ui.pageLineTool, &ui, colors);
	ui.actionLine->setData(QVariant::fromValue<AbstractTool*>(lineTool));

	curveTool = new CurveTool(canvas, ui.pageLineTool, &ui, colors);
	ui.actionCurve->setData(QVariant::fromValue<AbstractTool*>(curveTool));

	eraserTool = new EraserTool(canvas, ui.pageEraserTool, &ui, colors);
	ui.actionEraser-
>setData(QVariant::fromValue<AbstractTool*>(eraserTool));

	textTool = new TextTool(canvas, ui.pageTextTool, &ui, colors);
	ui.actionText->setData(QVariant::fromValue<AbstractTool*>(textTool));

	fillTool = new FillTool(canvas, ui.pageNoTool, &ui, colors);
	ui.actionFill->setData(QVariant::fromValue<AbstractTool*>(fillTool));

	takeColorTool = new TakeColorTool(canvas, ui.pageNoTool, &ui, colors);
	ui.actionTakeColor-
>setData(QVariant::fromValue<AbstractTool*>(takeColorTool));

	selectTool = new SelectTool(canvas, ui.pageSelectTool, &ui, colors);
	ui.actionSelect-
>setData(QVariant::fromValue<AbstractTool*>(selectTool));

	imageTool = new ImageTool(canvas, ui.pageNoTool, &ui, colors);

	//обьединение actions
	groupActionTool = new QActionGroup(this);
	groupActionTool->addAction(ui.actionBrush);
	groupActionTool->addAction(ui.actionEraser);
	groupActionTool->addAction(ui.actionText);
	groupActionTool->addAction(ui.actionFill);
	groupActionTool->addAction(ui.actionLine);
	groupActionTool->addAction(ui.actionCurve);
	groupActionTool->addAction(ui.actionTakeColor);
	groupActionTool->addAction(ui.actionSelect);

	connect(groupActionTool, SIGNAL(triggered(QAction*)), this,
SLOT(selectedTool(QAction*)));

	//назначение событий меню "Файл"
	connect(ui.actionNewFile,          SIGNAL(triggered()), this,
SLOT(onNewFileClicked()));
	connect(ui.actionOpenFile,         SIGNAL(triggered()), this,
SLOT(onOpenFileClicked()));
	connect(ui.actionSaveFile,         SIGNAL(triggered()), this,
SLOT(onSaveFileClicked()));
	connect(ui.actionSaveAsFile,  SIGNAL(triggered()), this,
SLOT(onSaveAsFileClicked()));
	connect(ui.actionPrint,            SIGNAL(triggered()), this,
SLOT(onPrintClicked()));
	connect(ui.actionExit,             SIGNAL(triggered()), this,
SLOT(close()));

	//назначение событий меню "Помощь"
```

```
	connect(ui.actionAbout,			SIGNAL(triggered()), this,
SLOT(onAboutClicked()));

	//назначение событий меню "Правка"
	connect(ui.actionCopy,			SIGNAL(triggered()), this,
SLOT(onCopyClicked()));
	connect(ui.actionPaste,			SIGNAL(triggered()), this,
SLOT(onPasteClicked()));
	connect(ui.actionCut,			SIGNAL(triggered()), this,
SLOT(onCutClicked()));

	//назначение событий меню "Выделение"
	connect(ui.actionSelectAll,	SIGNAL(triggered()), this,
SLOT(onSelectAllClicked()));
	connect(ui.actionDeselect,		SIGNAL(triggered()), this,
SLOT(onDeselectClicked()));

	//назначение событий для выбора цвета
	connect(ui.actionFgColor, SIGNAL(triggered()), this,
SLOT(selectFgColor()));
	connect(ui.actionBgColor, SIGNAL(triggered()), this,
SLOT(selectBgColor()));

	//событие "ограничить выделенным"
	connect(ui.checkBoxRestrictSelection, SIGNAL(toggled(bool)), this,
SLOT(onRestrictSelection(bool)));
}

Painter::~Painter()
{

}

//-----------------------------------------------
void Painter::onNewFileClicked()
{
	NewImageDialog dialog(this);
	if (dialog.exec() == QDialog::Accepted)
	{
		currentFileName.clear();
		canvas->newImage(dialog.getColor(), dialog.getSizeImage());

		colors->setBG(dialog.getColor());
	}
}

void Painter::onOpenFileClicked()
{
	QFileDialog openDialog(this, "Открыть изображение");
	openDialog.setAcceptMode(QFileDialog::AcceptOpen);
	openDialog.setFileMode(QFileDialog::AnyFile);

	//установка фильтра
	QStringList filters;
	QList<QByteArray> formats = QImageReader::supportedImageFormats();

	QString filterAllImage("Все изображения ");
	filterAllImage.append("(");
	foreach(QByteArray format, formats) filterAllImage.append("*." + format
+ " ");
	filterAllImage.append(")");
	filters.append(filterAllImage);

	foreach(QByteArray format, formats) filters << "*." + format;
```

```
	openDialog.setNameFilters(filters);

	//Вызов диалога
	if (openDialog.exec() == QFileDialog::Accepted)
	{
		currentFileName = openDialog.selectedFiles().at(0);
		bool result = canvas->loadImage(currentFileName);
		if (result == false) QMessageBox::critical(this, "Ошибка", "Фаил
не может быть загружен");
	}
}

//*** несделано ***//
void Painter::onSaveFileClicked()
{
	//Проверка возможности пересохранить файл
	bool supportedFormat = false;
	/*QString fileFormat = "";
	QList<QByteArray> formats = QImageWriter::supportedImageFormats();
	QList<QByteArray>::iterator  i = formats.begin();
	while(i != formats.end())
	{
		QString format(*i);
		if (fileFormat == format)
		{
			supportedFormat = true;
			break;
		}
		i++;
	}*/

	//выбор действия
	if (!currentFileName.isEmpty() && supportedFormat)
	{
		bool result = canvas->saveImage(currentFileName);
		if (result == false) QMessageBox::critical(this, "Ошибка", "Фаил
не может быть сохранён");
	}
	else
	{
		onSaveAsFileClicked();
	}
}

void Painter::onSaveAsFileClicked()
{
	QFileDialog saveDialog(this, "Сохранить изображение");
	saveDialog.setAcceptMode(QFileDialog::AcceptSave);
	saveDialog.setFileMode(QFileDialog::AnyFile);

	//установка фильтра
	QStringList filters;
	QList<QByteArray> formats = QImageWriter::supportedImageFormats();
	foreach(QByteArray format, formats) filters << "*." + format;
	saveDialog.setNameFilters(filters);

	//Вызов диалога
	if (saveDialog.exec() == QFileDialog::Accepted)
	{
		currentFileName = saveDialog.selectedFiles().at(0);
		currentFileName.append("." +
saveDialog.selectedFilter().split(".").at(1));
```

```
            bool result = canvas->saveImage(currentFileName);
            if (result == false) QMessageBox::critical(this, "Ошибка", "Фаил
не может быть сохранён");
      }
}

//-----------------------------------------------
void Painter::onAboutClicked()
{
      AboutDialog dialog(this);
      dialog.exec();
}

//-----------------------------------------------
void Painter::selectFgColor()
{
      QColorDialog dialog(this);
      dialog.setOption(QColorDialog::ShowAlphaChannel);
      dialog.setCurrentColor(colors->getFG());
      if (dialog.exec() == QDialog::Accepted)
      {
            colors->setFG(dialog.currentColor());
      }
}

void Painter::selectBgColor()
{
      QColorDialog dialog(this);
      dialog.setOption(QColorDialog::ShowAlphaChannel);
      dialog.setCurrentColor(colors->getBG());
      if (dialog.exec() == QDialog::Accepted)
      {
            colors->setBG(dialog.currentColor());
      }
}

void Painter::changeColors(int type, const QColor& color)
{
      QAction* action = (type == ActionColors::fg) ? ui.actionFgColor :
ui.actionBgColor;
      action->setIcon(ActionColors::getIconOfColor(color));
}

//-----------------------------------------------
void Painter::onCopyClicked()
{
      if (canvas->isSA())
      {
            QClipboard *clipboard = QApplication::clipboard();
            clipboard->setImage(canvas->getSA());
      }
}

void Painter::onCutClicked()
{
      if (canvas->isSA())
      {
            QClipboard *clipboard = QApplication::clipboard();
            clipboard->setImage(canvas->getSA());

            //закрасить цветом фона
            QPainter painter(canvas->getImage());
            painter.setCompositionMode(QPainter::CompositionMode_Source);
            painter.fillRect(canvas->getSARect(), colors->getBG());
```

```
            canvas->update();
      }
}

//*** несделано ***//
void Painter::onPasteClicked()
{
      canvas->clearSA();
      canvas->setCurrentTool(imageTool);

      QAction* action = groupActionTool->checkedAction();
      if (action != NULL) action->setChecked(false);
}

//-------------------------------------------------
void Painter::onSelectAllClicked()
{
      canvas->setSAMaxSize();
}

void Painter::onDeselectClicked()
{
      canvas->clearSA();
}

//-------------------------------------------------
void Painter::selectedTool(QAction* action)
{
      QVariant data = action->data();
      if (data.isValid() && data.canConvert<AbstractTool*>())
      {
            AbstractTool* tool = data.value<AbstractTool*>();
            canvas->setCurrentTool(tool);
      }
      else
      {
            canvas->setCurrentTool(NULL);
      }
}

void Painter::onRestrictSelection(bool state)
{
      canvas->restrictSelection(state);
}

void Painter::changeSA()
{
      //Обновление информации о выделенной области
      QRect SARect = canvas->getSARect();
      if (canvas->isSA())
      {
            ui.labelSelectX->setText(QString::number(SARect.x()));
            ui.labelSelectY->setText(QString::number(SARect.y()));
            ui.labelSelectW->setText(QString::number(SARect.width()));
            ui.labelSelectH->setText(QString::number(SARect.height()));
      }
      else
      {
            ui.labelSelectX->setText("-");
            ui.labelSelectY->setText("-");
            ui.labelSelectW->setText("-");
            ui.labelSelectH->setText("-");
      }
```

```
}

//-----------------------------------------------------------------------
void Painter::onPrintClicked()
{
	QPrinter printer(QPrinter::ScreenResolution);
	QPrintPreviewDialog dialog(&printer, this);
	dialog.setWindowFlags( Qt::Window );
	connect(&dialog, SIGNAL(paintRequested(QPrinter *)),
SLOT(printDocument(QPrinter*)));
	dialog.exec();
}

void Painter::printDocument(QPrinter* printer)
{
	QPainter painter(printer);
	printer->setPageMargins(20, 5, 5, 5, QPrinter::Millimeter);
	painter.drawImage(0, 0, *canvas->getImage());
}
```

canvas.h

```
#ifndef CANVAS_H
#define CANVAS_H

#include <QWidget>
#include "ui_painter.h"

class AbstractTool;
class Painter;

class Canvas : public QWidget
{
	Q_OBJECT

public:
	Canvas(QWidget *parent);
	~Canvas();

	void newImage(QColor color, QSize size);
	bool loadImage(const QString& fileName);
	bool saveImage(const QString& fileName);

	QImage* getImage();

	//методы выделенной области
	void	setSARect(QRect rect);
	void	setSAMaxSize();
	void	clearSA();
	QImage	getSA();
	QRect	getSARect();
	bool	isSA();

	void restrictSelection(bool restrict);
	bool isRestrictSelection();

	//текущий инструмент
	void setCurrentTool(AbstractTool* _tool);
	AbstractTool* getCurrentTool();

private:
```

```
	void paintEvent(QPaintEvent *event);
	bool event(QEvent* event);

	QImage image;
	AbstractTool* tool;

	QRect SARect;
	bool RS;

	QPixmap fon;

signals:
	void changeSA();

};

#endif // CANVAS_H
```

canvas.cpp

```
#include "StdAfx.h"
#include "canvas.h"

#include "abstracttool.h"
#include "painter.h"

Canvas::Canvas(QWidget *parent)
	: QWidget(parent), fon(":/Painter/Resources/img/fon.bmp")
{
	QSizePolicy sizePolicy(QSizePolicy::Fixed, QSizePolicy::Fixed);
	sizePolicy.setHorizontalStretch(0);
	sizePolicy.setVerticalStretch(0);
	setSizePolicy(sizePolicy);

	clearSA();
	tool = NULL;
}

Canvas::~Canvas()
{

}

void Canvas::newImage(QColor color, QSize size)
{
	clearSA();

	image = QImage(size, QImage::Format_ARGB32);

	//закрасить цветом фона
	QPainter painter(getImage());
	painter.setCompositionMode(QPainter::CompositionMode_Source);
	painter.fillRect(QRect(0, 0, image.width(), image.height()), color);

	setMinimumSize(size);
}

bool Canvas::saveImage(const QString& fileName)
{
	return image.save(fileName);
}
```

```
bool Canvas::loadImage(const QString& fileName)
{
	clearSA();

	bool result = image.load(fileName);
	if (result == true) setMinimumSize(image.size());
	return result;
}

QImage* Canvas::getImage()
{
	return &image;
}

void Canvas::paintEvent(QPaintEvent *event)
{
	//рисование pixmap
	QPainter painter(this);

	painter.setBackground(QBrush(fon));
	painter.eraseRect(QRect(0, 0, width(), height()));

	painter.drawImage(0, 0, image);
	painter.end();

	//предпросмотр
	if (tool != NULL) tool->preview(this);

	//рисование Select Area
	if (isSA())
	{
		painter.begin(this);
		painter.setCompositionMode(QPainter::CompositionMode_Exclusion);
		painter.setPen(QPen(Qt::white, 1, Qt::DashLine));
		painter.drawRect(SARect.x(), SARect.y(), SARect.width()-1,
SARect.height()-1);

		if (RS)
		{

	painter.setCompositionMode(QPainter::CompositionMode_SourceOver);
			QColor rColor = QColor(3, 70, 132, 150);

			QRect rectTop(0, 0, width() , SARect.y());
			painter.fillRect(rectTop, rColor); //сверх
			QRect rectBottom(QPoint(0, SARect.bottom()+1),
QPoint(width(), height()));
			painter.fillRect(rectBottom, rColor);//сниз
			QRect rectLeft(QPoint(0, SARect.y()), QPoint(SARect.x()-1,
SARect.bottom()));
			painter.fillRect(rectLeft, rColor); //слева
			QRect rectRight(QPoint(SARect.right()+1, SARect.y()),
QPoint(width(), SARect.bottom()));
			painter.fillRect(rectRight, rColor); //справа
		}

		painter.end();
	}
}

bool Canvas::event(QEvent* event)
{
	bool result = QWidget::event(event);
	if (tool != NULL) tool->canvasEvent(event);
```

```
	return result;
}

//-----------------------------------------------

void Canvas::setCurrentTool(AbstractTool* _tool)
{
	if (tool != NULL) tool->disable(true);
	tool = _tool;
	if (tool != NULL) tool->enable();
}

AbstractTool* Canvas::getCurrentTool()
{
	return tool;
}

//-----------------------------------------------
void Canvas::clearSA()
{
	SARect.setSize(QSize(0, 0));
	changeSA();
	update();
}

void Canvas::setSAMaxSize()
{
	setSARect(QRect(0, 0, width(), height()));
	update();
}

QImage Canvas::getSA()
{
	return image.copy(SARect);
}

void Canvas::setSARect(QRect rect)
{
	QRect newSARect = rect.intersect(image.rect());
	if (SARect != newSARect)
	{
		SARect = newSARect;
		changeSA();
	}

	update();
}

QRect Canvas::getSARect()
{
	return SARect;
}

bool Canvas::isSA()
{
	return SARect.height() > 2 && SARect.width() > 2;
}

void Canvas::restrictSelection(bool restrict)
{
	RS = restrict;
	update();
}
```

```
bool Canvas::isRestrictSelection()
{
	return RS;
}
//-----------------------------------------------
```

actioncolors.h

```
#ifndef ACTIONCOLORS_H
#define ACTIONCOLORS_H

#include <QObject>

class ActionColors : public QObject
{
	Q_OBJECT

public:
	ActionColors(QObject *parent);
	~ActionColors();

	enum TypeColor {bg = 0, fg = 1};

	void setColor(TypeColor type, const QColor& color);
	void setBG(const QColor& color);
	void setFG(const QColor& color);

	QColor getColor(TypeColor type);
	QColor getBG();
	QColor getFG();

	static QIcon getIconOfColor(const QColor& color);
	static QPixmap getPixmapOfColor(const QColor& color, const QSize& size);

private:
	QColor colors[2];

signals:
	void changeColors(int, const QColor&);
};

#endif // ACTIONCOLORS_H
```

actioncolors.cpp

```
#include "StdAfx.h"
#include "actioncolors.h"

ActionColors::ActionColors(QObject *parent)
	: QObject(parent)
{

}

ActionColors::~ActionColors()
{

}
```

```
void ActionColors::setColor(TypeColor type, const QColor& color)
{
	if (color != colors[type])
	{
		colors[type] = color;
		emit changeColors(type, color);
	}
}

void ActionColors::setBG(const QColor& color)
{
	setColor(bg, color);
}

void ActionColors::setFG(const QColor& color)
{
	setColor(fg, color);
}

QColor ActionColors::getColor(TypeColor type)
{
	return colors[type];
}

QColor ActionColors::getBG()
{
	return colors[bg];
}

QColor ActionColors::getFG()
{
	return colors[fg];
}

QIcon ActionColors::getIconOfColor(const QColor& color)
{
	QPixmap pixmap = getPixmapOfColor(color, QSize(16, 16));
	QPainter painter(&pixmap);

	painter.setPen(QPen(Qt::black));
	painter.drawRect(0, 0, 15, 15);

	return QIcon(pixmap);
}

QPixmap ActionColors::getPixmapOfColor(const QColor& color, const QSize&
size)
{
	QPixmap pixmap(size);

	QPainter painter(&pixmap);
	QPixmap fon(":/Painter/Resources/img/fon.bmp");
	painter.setBackground(QBrush(fon));
	painter.eraseRect(pixmap.rect());

	painter.fillRect(pixmap.rect(), QBrush(color));
	return pixmap;
}
```

newimagedialog.h

```
#ifndef NEWIMAGEDIALOG_H
#define NEWIMAGEDIALOG_H

#include <QDialog>
#include <QPixmap>
#include "ui_newimagedialog.h"
#include "actioncolors.h"

class NewImageDialog : public QDialog
{
	Q_OBJECT

public:
	NewImageDialog(QWidget *parent = 0);
	~NewImageDialog();

	QColor getColor();
	QSize getSizeImage();

private:
	Ui::NewImageDialog ui;
	QSize sizeImage;
	QColor color;

private slots:
	void onTakeColor();
	void accept();
};

#endif // NEWIMAGEDIALOG_H
```

newimagedialog.cpp

```
#include "StdAfx.h"
#include "newimagedialog.h"

NewImageDialog::NewImageDialog(QWidget *parent)
	: QDialog(parent)
{
	ui.setupUi(this);

	color = QColor(Qt::white);
	ui.buttonColor->setIcon(ActionColors::getIconOfColor(color));

	connect(ui.buttonCreate, SIGNAL(clicked()), this, SLOT(accept()));
	connect(ui.buttonCancel, SIGNAL(clicked()), this, SLOT(reject()));
	connect(ui.buttonColor, SIGNAL(clicked()), this, SLOT(onTakeColor()));
}

NewImageDialog::~NewImageDialog(){}

void NewImageDialog::accept()
{
	sizeImage.setHeight(ui.editH->text().toInt());
	sizeImage.setWidth(ui.editW->text().toInt());

	QDialog::accept();
}
```

```
void NewImageDialog::onTakeColor()
{
	QColorDialog colorDlg(this);
	colorDlg.setOption(QColorDialog::ShowAlphaChannel);
	int code = colorDlg.exec();
	if (code != 0)
	{
		color = colorDlg.currentColor();
		ui.buttonColor->setIcon(ActionColors::getIconOfColor(color));
	}
}

QColor NewImageDialog::getColor()
{
	return color;
}

QSize NewImageDialog::getSizeImage()
{
	return sizeImage;
}
```

abstracttool.h

```
#ifndef ABSTRACTTOOL_H
#define ABSTRACTTOOL_H

#include <QObject>
#include "painter.h"
#include "canvas.h"
#include "actioncolors.h"

class AbstractTool : public QObject
{
	Q_OBJECT

public:
	AbstractTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
	~AbstractTool();

	virtual void enable();
	virtual void disable(bool apply);

	virtual void preview(QPaintDevice* device);

	//События canvas
	virtual void canvasEvent(QEvent *);
	virtual void canvasMouseMove(QMouseEvent*);
	virtual void canvasMouseButtonRelease(QMouseEvent*);
	virtual void canvasMouseButtonPress(QMouseEvent*);
	virtual void canvasKeyPress(QKeyEvent*);

protected:
	Canvas* canvas;
	ActionColors* colors;
	Ui::PainterClass* ui;

private:
	QWidget* page;
};

#endif // ABSTRACTTOOL_H
```

abstracttool.cpp

```
#include "StdAfx.h"
#include "abstracttool.h"

AbstractTool::AbstractTool(Canvas* _canvas, QWidget* _page, Ui::PainterClass*
_ui, ActionColors* _colors)
{
	colors = _colors;
	canvas = _canvas;
	page = _page;
	ui = _ui;
}

AbstractTool::~AbstractTool()
{

}

void AbstractTool::canvasEvent(QEvent *event)
{
	switch(event->type())
	{
		case QEvent::MouseMove:
		{
			QMouseEvent* mouseEvent = static_cast<QMouseEvent *>(event);
			canvasMouseMove(mouseEvent);
		}
		break;
		case QEvent::MouseButtonPress:
		{
			QMouseEvent* mouseEvent = static_cast<QMouseEvent *>(event);
			canvasMouseButtonPress(mouseEvent);
		}
		break;
		case QEvent::MouseButtonRelease:
		{
			QMouseEvent* mouseEvent = static_cast<QMouseEvent *>(event);
			canvasMouseButtonRelease(mouseEvent);
		}
		break;
		case QEvent::KeyPress:
		{
			QKeyEvent* keyEvent = static_cast<QKeyEvent *>(event);
			canvasKeyPress(keyEvent);
		}
	}
}

void AbstractTool::enable()
{
	ui->stackedParamTools->setCurrentWidget(page);
}

void AbstractTool::disable(bool apply)
{
	ui->stackedParamTools->setCurrentWidget(ui->pageNoTool);
}

void AbstractTool::canvasMouseMove(QMouseEvent *event)		{}
void AbstractTool::canvasMouseButtonRelease(QMouseEvent *event)	{}
void AbstractTool::canvasMouseButtonPress(QMouseEvent *event)	{}
void AbstractTool::canvasKeyPress(QKeyEvent *event)		{}
```

```
void AbstractTool::preview(QPaintDevice* device)                    {}
```

brushtool.h

```
#ifndef BRUSHTOOL_H
#define BRUSHTOOL_H

#include <QPointF>
#include <QPixmap>
#include <QColor>
#include <QLineF>

#include "abstracttool.h"

class BrushTool : public AbstractTool
{
      Q_OBJECT

public:
      BrushTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
      ~BrushTool();

private:
      QColor color;
      qreal size;
      QPointF prPos;

      QPixmap pixmap;
      bool isPreview;

      void drawLine(QPaintDevice* device, QPointF p1, QPointF p2);
      void drawCircle(QPaintDevice* device, QPointF point);

protected:
      void preview(QPaintDevice* device);

      void canvasMouseMove(QMouseEvent*);
      void canvasMouseButtonRelease(QMouseEvent*);
      void canvasMouseButtonPress(QMouseEvent*);
};

#endif // BRUSHTOOL_H
```

brushtool.cpp

```
#include "StdAfx.h"
#include "brushtool.h"

BrushTool::BrushTool(Canvas* canvas, QWidget* page, Ui::PainterClass* ui,
ActionColors* colors)
      : AbstractTool(canvas, page, ui, colors)
{

}

BrushTool::~BrushTool()
{

}
```

```
void BrushTool::canvasMouseMove(QMouseEvent *event)
{
	drawLine(&pixmap, prPos, event->posF());
	prPos = event->posF();

	canvas->update();
}

void BrushTool::canvasMouseButtonRelease(QMouseEvent *event)
{
	QPainter painter(canvas->getImage());
	painter.drawPixmap(0, 0, pixmap);
	isPreview = false;
}

void BrushTool::canvasMouseButtonPress(QMouseEvent *event)
{
	//Выбор цвета
	color = (event->button() == Qt::LeftButton) ? colors->getFG() : colors-
>getBG();

	//Задание размера
	size = ui->sliderSizeBrush->value();

	//Временный pixmap
	pixmap = QPixmap(canvas->getImage()->size());
	pixmap.fill(QColor(0,0,0,0));

	drawCircle(&pixmap, event->posF());
	prPos = event->posF();
	isPreview = true;
}


void BrushTool::preview(QPaintDevice* device)
{
	if (isPreview)
	{
		QPainter painter(device);
		painter.drawPixmap(0, 0, pixmap);
	}
}

void BrushTool::drawLine(QPaintDevice* device, QPointF p1, QPointF p2)
{
	QPainter painter(device);
	if (canvas->isRestrictSelection() && canvas->isSA())
	{
		painter.setClipRect(canvas->getSARect());
	}
	painter.setCompositionMode(QPainter::CompositionMode_Source); //без
учёта прозрачности цвета
	painter.setRenderHint(QPainter::Antialiasing, true);
	painter.setPen(QPen(color, size, Qt::SolidLine, Qt::RoundCap,
Qt::RoundJoin));
	painter.drawLine(p1, p2);

	canvas->update();
}

void BrushTool::drawCircle(QPaintDevice* device, QPointF point)
{
	QPainter painter(device);
	if (canvas->isRestrictSelection() && canvas->isSA())
```

```
	{
		painter.setClipRect(canvas->getSARect());
	}
	painter.setCompositionMode(QPainter::CompositionMode_Source); //без
учёта прозрачности цвета
	painter.setRenderHint(QPainter::Antialiasing, true);
	painter.setPen(Qt::NoPen);
	painter.setBrush(color);
	painter.drawEllipse(point, size/2, size/2);

	canvas->update();
}
```

erasertool.h

```
#ifndef ERASERTOOL_H
#define ERASERTOOL_H

#include "abstracttool.h"

class EraserTool : public AbstractTool
{
	Q_OBJECT

public:
	EraserTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
	~EraserTool();

private:
	void draw();
	QPoint p1, p2;
	QColor color;
	int size;

	QPolygon getEraserShape(const QPoint& p1, const QPoint& p2, int size);

protected:
	void canvasMouseMove(QMouseEvent*);
	void canvasMouseButtonPress(QMouseEvent*);
};

#endif // ERASERTOOL_H
```

erasertool.cpp

```
#include "StdAfx.h"
#include "erasertool.h"

EraserTool::EraserTool(Canvas* canvas, QWidget* page, Ui::PainterClass* ui,
ActionColors* colors)
	: AbstractTool(canvas, page, ui, colors)
{

}

EraserTool::~EraserTool()
{

}
```

```
void EraserTool::canvasMouseMove(QMouseEvent* event)
{
	p1 = event->pos();
	draw();

	p2 = p1;
}

void EraserTool::canvasMouseButtonPress(QMouseEvent*  event)
{
	p1 = event->pos();
	p2 = event->pos();
	color = (event->button() == Qt::LeftButton)? colors->getBG() : colors-
>getFG();
	size = ui->sliderSizeEraser->value();

	draw();
}

QPolygon EraserTool::getEraserShape(const QPoint& p1, const QPoint& p2, int
size)
{
	QPoint p = p1 - p2;

	if (p.isNull())
	{
		QPolygon poly(4);
		poly.setPoint(0, p1.x()+size/2, p1.y()+size/2);
		poly.setPoint(1, p1.x()+size/2, p1.y()-size/2);
		poly.setPoint(2, p1.x()-size/2, p1.y()-size/2);
		poly.setPoint(3, p1.x()-size/2, p1.y()+size/2);
		return poly;
	}

	int mx = p.x() > 0? 1 : -1;
	int my = p.y() > 0? 1 : -1;

	QPolygon poly(6);

	//p1 rect
	poly.setPoint(0, p1.x() + (size/2)*mx, p1.y() - (size/2)*my);
	poly.setPoint(1, p1.x() + (size/2)*mx, p1.y() + (size/2)*my);
	poly.setPoint(2, p1.x() - (size/2)*mx, p1.y() + (size/2)*my);

	//p2 rect
	poly.setPoint(3, p2.x() - (size/2)*mx, p2.y() + (size/2)*my);
	poly.setPoint(4, p2.x() - (size/2)*mx, p2.y() - (size/2)*my);
	poly.setPoint(5, p2.x() + (size/2)*mx, p2.y() - (size/2)*my);

	return poly;
}

void EraserTool::draw()
{
	QPainter painter(canvas->getImage());

	if (canvas->isRestrictSelection() && canvas->isSA())
	{
		painter.setClipRect(canvas->getSARect());
	}

	painter.setRenderHint(QPainter::Antialiasing, true);
	painter.setCompositionMode(QPainter::CompositionMode_Source);
```

```
	painter.setPen(Qt::NoPen);
	painter.setBrush(color);

	painter.drawPolygon(getEraserShape(p1, p2, size));
	canvas->update();
}
```

filltool.h

```
#ifndef FILLTOOL_H
#define FILLTOOL_H

#include <QRgb>
#include "abstracttool.h"

class FillTool : public AbstractTool
{
	Q_OBJECT

public:
	FillTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
	~FillTool();

private:
	QStack<QPoint> stack;
	void floodFillScanlineStack(QImage* image, int x, int y, QRgb newColor);

protected:
	void canvasMouseButtonPress(QMouseEvent*);
};

#endif // FILLTOOL_H
```

filltool.cpp

```
#include "StdAfx.h"
#include "filltool.h"

FillTool::FillTool(Canvas* canvas, QWidget* page, Ui::PainterClass* ui,
ActionColors* colors)
	: AbstractTool(canvas, page, ui, colors)
{

}

FillTool::~FillTool()
{

}

void FillTool::canvasMouseButtonPress(QMouseEvent* event)
{
	QColor color = (event->button() == Qt::LeftButton)? colors->getFG() :
colors->getBG();
	floodFillScanlineStack(canvas->getImage(), event->x(), event->y(),
color.rgba());
	canvas->update();
}
```

```
//The scanline floodfill algorithm using our own stack routines,
faster(http://lodev.org/cgtutor/floodfill.html)
void FillTool::floodFillScanlineStack(QImage* image, int x, int y, QRgb
newColor)
{
	QRgb oldColor = image->pixel(x, y);
	if (newColor == oldColor) return;
	stack.clear();

	int y1;
	bool spanLeft, spanRight;
	int w = image->width();
	int h = image->height();

	stack.push(QPoint(x, y));

	while(!stack.isEmpty())
	{
		QPoint point = stack.pop();
		x = point.x();
		y = point.y();

		y1 = y;
		while(y1 >= 0 && image->pixel(x, y1) == oldColor) y1--;
		y1++;
		spanLeft = spanRight = 0;
		while(y1 < h && image->pixel(x, y1) == oldColor )
		{
			image->setPixel(x, y1, newColor);
			if(!spanLeft && x > 0 && image->pixel(x - 1, y1) ==
oldColor)
			{
				stack.push(QPoint(x - 1, y1));
				spanLeft = 1;
			}
			else if(spanLeft && x > 0 && image->pixel(x - 1, y1) !=
oldColor)
			{
				spanLeft = 0;
			}
			if(!spanRight && x < w - 1 && image->pixel(x + 1, y1) ==
oldColor)
			{
				stack.push(QPoint(x + 1, y1));
				spanRight = 1;
			}
			else if(spanRight && x < w - 1 && image->pixel(x + 1, y1) !=
oldColor)
			{
				spanRight = 0;
			}
			y1++;
		}
	}
}
```

imagetool.h

```
#ifndef IMAGETOOL_H
#define IMAGETOOL_H

#include "abstracttool.h"

class ImageTool : public AbstractTool
{
	Q_OBJECT

public:
	ImageTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
	~ImageTool();

private:
	QPoint pos;
	QPoint dragPoint;

	bool isImage, isDrag;
	QImage image;

	void draw(QPaintDevice* device, bool preview);

protected:
	void canvasMouseMove(QMouseEvent*);
	void canvasMouseButtonRelease(QMouseEvent*);
	void canvasMouseButtonPress(QMouseEvent*);
	void preview(QPaintDevice* device);
	void enable();
	void disable(bool apply);
};

#endif // IMAGETOOL_H
```

imagetool.cpp

```
#include "StdAfx.h"
#include "imagetool.h"

ImageTool::ImageTool(Canvas* canvas, QWidget* page, Ui::PainterClass* ui,
ActionColors* colors)
	: AbstractTool(canvas, page, ui, colors)
{

}

ImageTool::~ImageTool()
{

}

void ImageTool::enable()
{
	AbstractTool::enable();

	//начальные значения
	pos = QPoint(0,0);
	dragPoint = QPoint(0,0);
	isImage = false;
	isDrag = false;
```

```
	//Взять изображение из буфера обмена
	QClipboard *clipboard = QApplication::clipboard();
	image = clipboard->image();
	isImage = true;

	canvas->update();
}

void ImageTool::disable(bool apply)
{
	AbstractTool::disable(apply);

	//нарисовать
	if (apply)
		draw(canvas->getImage(), false);

	canvas->update();
}

void ImageTool::preview(QPaintDevice* device)
{
	draw(device, true);
}

void ImageTool::draw(QPaintDevice* device, bool preview)
{
	if (isImage)
	{
		QPainter painter(device);
		painter.drawImage(pos, image);

		if (preview)
		{
			QRect rectP = image.rect();
			rectP.moveTo(pos);
			painter.setPen(QPen(Qt::black, 1, Qt::DashLine));
			painter.drawRect(rectP.x(), rectP.y(), rectP.width()-1,
rectP.height()-1);
		}
	}
}

void ImageTool::canvasMouseMove(QMouseEvent* event)
{
	if (isDrag)
	{
		QPoint mp = event->pos();
		pos = mp + dragPoint;
		canvas->update();
	}
}

void ImageTool::canvasMouseButtonPress(QMouseEvent* event)
{
	if (isImage)
	{
		if (event->button() == Qt::LeftButton)
		{
			QPoint mp = event->pos();
			QRect rectP = image.rect();
			rectP.moveTo(pos);

			if (rectP.contains(mp))
```

```
                {
                        dragPoint = rectP.topLeft() - mp;
                        isDrag = true;
                }
                else
                {
                        //нарисовать
                        draw(canvas->getImage(), false);
                        isImage = false;
                }
        }
        else
        {
                //нарисовать
                draw(canvas->getImage(), false);
                isImage = false;
        }
    }

    canvas->update();
}

void ImageTool::canvasMouseButtonRelease(QMouseEvent* event)
{
    isDrag = false;
}
```

linetool.h

```
#ifndef LINETOOL_H
#define LINETOOL_H

#include "abstracttool.h"

class LineTool : public AbstractTool
{
    Q_OBJECT

public:
    LineTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
    ~LineTool();

    enum StateLineTool {SetPoints = 0, FindMovePoint = 1, MovePoint = 3};

private:
    QVector<QPoint> points;
    QPoint mp;

    StateLineTool state;

    int width;
    int radius;
    int indexMoveP;

    void draw(QPaintDevice* device, bool preview);

    int findIndexPoint(const QVector<QPointF>& points, const QPointF& pos,
qreal radius);

protected:
    void canvasMouseMove(QMouseEvent*);
```

```
	void canvasMouseButtonPress(QMouseEvent*);
	void canvasMouseButtonRelease(QMouseEvent*);

	void preview(QPaintDevice* device);

	void enable();
	void disable(bool apply);

public slots:
	void sizeChanged(int i);
};

#endif // LINETOOL_H
```

linetool.cpp

```
#include "StdAfx.h"
#include "linetool.h"

LineTool::LineTool(Canvas* canvas, QWidget* page, Ui::PainterClass* ui,
ActionColors* colors)
	: AbstractTool(canvas, page, ui, colors)
{
	connect(ui->sliderSizeLine, SIGNAL(valueChanged(int)), this,
SLOT(sizeChanged(int)));

}

LineTool::~LineTool()
{

}


void LineTool::enable()
{
	AbstractTool::enable();

	sizeChanged(ui->sliderSizeLine->value());

	state = SetPoints;
	canvas->setMouseTracking(true);
}

void LineTool::disable(bool apply)
{
	AbstractTool::disable(apply);

	if (apply) draw(canvas->getImage(), false);
	points.clear();

	canvas->update();
	canvas->setMouseTracking(false);
}

void LineTool::canvasMouseMove(QMouseEvent* event)
{
	mp = event->pos();

	if (state == MovePoint)
		points[indexMoveP] = mp;
```

```
	canvas->update();
}

void LineTool::canvasMouseButtonRelease(QMouseEvent* event)
{
	if (state == MovePoint && event->button() == Qt::LeftButton)
	{
		state = FindMovePoint;
	}
}

void LineTool::canvasMouseButtonPress(QMouseEvent* event)
{
	int btn = event->button();
	switch(state)
	{
		case SetPoints:
		{
			if (btn == Qt::LeftButton)
			{
				points.append(event->pos());
			}
			else
			{
				if (points.size() == 1)
				{
					points.clear();
				}
				else if (points.size() > 1)
				{
					state = FindMovePoint;
				}
			}
		}
		break;
		case FindMovePoint:
		{
			if (btn == Qt::LeftButton)
			{
				indexMoveP = -1;
				qreal r = radius;
				for (int i = 0; i < points.size(); i++)
				{
					qreal x = points[i].x() - event->x();
					qreal y = points[i].y() - event->y();
					qreal len = qSqrt(x*x + y*y);
					if (len < r)
					{
						r = len;
						indexMoveP = i;
					}
				}

				if (indexMoveP != -1)
				{
					state = MovePoint;
				}
				else
				{
					//Нарисовать на pixmap
					draw(canvas->getImage(), false);
					state = SetPoints;
					points.clear();
```

```
                                    //...
                                    if (btn == Qt::LeftButton) points.append(event-
>pos());
                              }
                        }
                        else if (btn == Qt::RightButton)
                        {
                              //Нарисовать на pixmap
                              draw(canvas->getImage(), false);
                              state = SetPoints;
                              points.clear();
                        }
                  }
            }

            ui->labelCountPoint->setText(QString::number(points.size()));
            canvas->update();
}

int LineTool::findIndexPoint(const QVector<QPointF>& points, const QPointF&
pos, qreal radius)
{
            int j = -1;
            qreal r = radius;
            for (int i = 0; i < points.size(); i++)
            {
                  qreal x = points[i].x() - pos.x();
                  qreal y = points[i].y() - pos.y();
                  qreal len = qSqrt(x*x + y*y);
                  if (len < r)
                  {
                        r = len;
                        j = i;
                  }
            }
            return j;
}

void LineTool::preview(QPaintDevice* device)
{
            draw(device, true);
}

void LineTool::draw(QPaintDevice* device, bool preview)
{
            if (points.size() > 0)
            {
                  QPainter painter(device);

                  if (canvas->isRestrictSelection() && canvas->isSA())
                  {
                        painter.setClipRect(canvas->getSARect());
                  }

                  painter.setRenderHint(QPainter::Antialiasing, true);
                  painter.setPen(QPen(colors->getFG(), width, Qt::SolidLine,
Qt::RoundCap, Qt::RoundJoin));

                  //рисование линий
                  QPainterPath path;
                  path.moveTo(points[0]);
                  foreach(QPoint point, points)
                                          path.lineTo(point);
```

```
            if (preview && state == SetPoints) path.lineTo(mp);
            painter.drawPath(path);

            //рисование кружков на изломах
            if (preview)
            {
                  painter.setClipping(false);
                  painter.setPen(QPen(Qt::black, 2));
                  foreach(QPoint point, points)
                  painter.drawEllipse(point, radius/2, radius/2);

                  //кружок под курсором
                  if (state == SetPoints)
                  {
                        painter.drawEllipse(mp, radius/2, radius/2);
                  }
            }
      }
}

void LineTool::sizeChanged(int i)
{
      width = i;
      radius = ( qMax(width, 8) + 4 ) * 1.5;

      canvas->update();
}
```

selecttool.h

```
#ifndef SELECTTOOL_H
#define SELECTTOOL_H

#include <QPoint>
#include "abstracttool.h"

class SelectTool : public AbstractTool
{
      Q_OBJECT

public:
      SelectTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
      ~SelectTool();

private:
      QPoint point;
      bool selectActive;

protected:
      void canvasMouseMove(QMouseEvent*);
      void canvasMouseButtonRelease(QMouseEvent*);
      void canvasMouseButtonPress(QMouseEvent*);
};

#endif // SELECTTOOL_H
```

selecttool.cpp

```
#include "StdAfx.h"
#include "selecttool.h"

SelectTool::SelectTool(Canvas* canvas, QWidget* page, Ui::PainterClass* ui,
ActionColors* colors)
	: AbstractTool(canvas, page, ui, colors)
{

}

SelectTool::~SelectTool()
{

}

void SelectTool::canvasMouseMove(QMouseEvent* event)
{
	if (selectActive)
	{
		QRect rect(point, event->pos());
		canvas->setSARect(rect.normalized());
	}
}

void SelectTool::canvasMouseButtonRelease(QMouseEvent* event)
{
	if (selectActive)
	{
		QRect rect(point, event->pos());
		canvas->setSARect(rect.normalized());
		selectActive = false;
	}
}

void SelectTool::canvasMouseButtonPress(QMouseEvent* event)
{
	if (event->button() == Qt::LeftButton)
	{
		point = event->pos();
		selectActive = true;
	}
	else if (event->button() == Qt::RightButton)
	{
		canvas->clearSA();
		selectActive = false;
	}
}
```

takecolortool.h

```
#ifndef TAKECOLORTOOL_H
#define TAKECOLORTOOL_H

#include "abstracttool.h"

class TakeColorTool : public AbstractTool
{
	Q_OBJECT
```

```
public:
	TakeColorTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
	~TakeColorTool();


protected:
	void canvasMouseButtonPress(QMouseEvent*);
	void disable(bool apply);
	void enable();
};

#endif // TAKECOLORTOOL_H
```

takecolortool.cpp

```
#include "StdAfx.h"
#include "takecolortool.h"

TakeColorTool::TakeColorTool(Canvas* canvas, QWidget* page, Ui::PainterClass*
ui, ActionColors* colors)
	: AbstractTool(canvas, page, ui, colors)
{

}

TakeColorTool::~TakeColorTool()
{

}

void TakeColorTool::enable()
{
	AbstractTool::enable();
	canvas->setMouseTracking(true);
}

void TakeColorTool::disable(bool apply)
{
	AbstractTool::disable(apply);
	canvas->setMouseTracking(false);
}

void TakeColorTool::canvasMouseButtonPress(QMouseEvent* event)
{
	QRgb rgb = canvas->getImage()->pixel(event->pos());
	QColor color = QColor::fromRgba(rgb);
	if (event->button() == Qt::LeftButton)
		colors->setFG(color);
	else
		colors->setBG(color);
}
```

texttool.h

```
#ifndef TEXTTOOL_H
#define TEXTTOOL_H

#include "abstracttool.h"

class TextTool : public AbstractTool
{
	Q_OBJECT

public:
	TextTool(Canvas*, QWidget*, Ui::PainterClass*, ActionColors*);
	~TextTool();

	enum StateTextTool {SetPositionText = 0, EditText = 1, MoveText = 2};

private:
	QPoint pos;
	QRect rect;

	QString text;
	QFont font;
	bool visibleFon;
	int cpos;

	QPoint dragPoint;

	StateTextTool state;

	void draw(QPaintDevice*);

protected:
	void canvasMouseMove(QMouseEvent*);
	void canvasMouseButtonRelease(QMouseEvent*);
	void canvasMouseButtonPress(QMouseEvent*);
	void preview(QPaintDevice* device);
	void enable();
	void disable(bool apply);

public slots:
	void valueChanged();
	void textCPhanged(int, int);
};

#endif // TEXTTOOL_H
```

texttool.cpp

```
#include "StdAfx.h"
#include "texttool.h"

TextTool::TextTool(Canvas* canvas, QWidget* page, Ui::PainterClass* ui,
ActionColors* colors)
	: AbstractTool(canvas, page, ui, colors)
{
	connect(ui->textTool_edit, SIGNAL(textChanged(const QString&)), this,
SLOT(valueChanged()));
	connect(ui->textTool_size, SIGNAL(valueChanged(const QString&)), this,
SLOT(valueChanged()));
```

```
	connect(ui->textTool_font, SIGNAL(currentFontChanged(const QFont&)),
this, SLOT(valueChanged()));
	connect(ui->textTool_fonV, SIGNAL(stateChanged(int)), this,
SLOT(valueChanged()));
	connect(ui->checkItalic, SIGNAL(stateChanged(int)), this,
SLOT(valueChanged()));
	connect(ui->checkBold, SIGNAL(stateChanged(int)), this,
SLOT(valueChanged()));

	connect(ui->textTool_edit, SIGNAL(cursorPositionChanged(int, int)),
this, SLOT(textCPhanged(int, int)));

	valueChanged();
}

TextTool::~TextTool()
{

}

void TextTool::disable(bool apply)
{
	AbstractTool::disable(apply);

	if (apply) draw(canvas->getImage());

	state = SetPositionText;
	ui->textTool_edit->clear();
	canvas->update();
}

void TextTool::enable()
{
	AbstractTool::enable();
	state = SetPositionText;
}

void TextTool::canvasMouseMove(QMouseEvent* event)
{
	if (state == MoveText)
	{
		pos = event->pos() + dragPoint;
		canvas->update();
	}
}

void TextTool::canvasMouseButtonRelease(QMouseEvent* event)
{
	if (state == MoveText) state = EditText;
}

void TextTool::canvasMouseButtonPress(QMouseEvent* event)
{
	int btn = event->button();

	QRect rectP = rect;
	rectP.moveTo(pos);

	if (state == EditText)
	{
		if (btn == Qt::RightButton)
		{
			draw(canvas->getImage());
			ui->textTool_edit->clear();
```

```
                state = SetPositionText;
            }
            else
            {
                if (rectP.contains(event->pos()))
                {
                    state = MoveText;
                    dragPoint =  rectP.topLeft() - event->pos();
                }
                else
                {
                    draw(canvas->getImage());
                    ui->textTool_edit->clear();

                    state = SetPositionText;
                }
            }
        }

        if (state == SetPositionText && btn == Qt::LeftButton)
        {
            pos = event->pos();
            ui->textTool_edit->setFocus();
            state = EditText;
        }

        canvas->update();
}

void TextTool::draw(QPaintDevice* device)
{
        QPainter painter(device);

        if (canvas->isRestrictSelection() && canvas->isSA())
        {
            painter.setClipRect(canvas->getSARect());
        }

        painter.setRenderHint(QPainter::TextAntialiasing, true);
        painter.setPen(colors->getFG());
        painter.setFont(font);

        QRect rectP = rect;
        rectP.moveTo(pos);

        if (!visibleFon)
            painter.fillRect(rectP, colors->getBG());

        painter.drawText(rectP , 0, text);
}

void TextTool::preview(QPaintDevice* device)
{
        if (state == EditText || state == MoveText)
        {
            draw(device);

            //Вывод курсора и выделения
            QFontMetrics fm(font);
            int shiftCW = fm.width(text, cpos); //смешение текстового курсора
            int h = fm.height();                                    //высота
текста
```

```
            QRect rectP = rect;
            rectP.moveTo(pos);

            int xc = rectP.x() + shiftCW;
            int y = rectP.y();

            QPainter painter(device);
            painter.fillRect(QRect(xc, y, 1, h), colors->getFG());
      }
}

void TextTool::valueChanged()
{
      text = ui->textTool_edit->text();
      visibleFon = ui->textTool_fonV->isChecked();

      int size = ui->textTool_size->value();
      bool bold = ui->checkBold->isChecked();
      bool italic = ui->checkItalic->isChecked();
      font = ui->textTool_font->currentFont();
      font.setPointSize(size);
      font.setItalic(italic);
      font.setBold(bold);

      QFontMetrics fm(font);
      rect = fm.boundingRect(text);

      canvas->update();
}

void TextTool::textCPhanged(int oldP, int newP)
{
      cpos = newP;
      canvas->update();
}
```

Диаграмма вариантов использования