实验三

### 实验目的

熟练API编写Windows窗体程序

## 实验内容

完成动态风扇、画图、诗词显示程序

### 实现代码

动态风扇

#include<Windows.h>

#include<math.h>

#include<stdio.h>

//窗体尺寸信息

#define thisWidth 700//程序宽度

#define thisHeight 700//程序高度

#define PI 3.1415926

HWND hwnd;//主窗体

POINT pt[3], cc = { 350,350 };//各点坐标、圆心坐标

INT R = 200;//风扇半径

INT theta = 0;//旋转角度

HDC hDC, memDC;

HBITMAP hBMP;

HBRUSH hRGB[3], hNull;

PAINTSTRUCT ps;

//窗体回调

LRESULT WINAPI CtlProc(HWND hWnd, UINT message, WPARAM wParam, LPARAM lParam)

{

INT i;

switch (message)

{

case WM\_CREATE:

hDC = GetDC(hWnd);

hRGB[0] = CreateSolidBrush(RGB(255, 0, 0));

hRGB[1] = CreateSolidBrush(RGB(0, 255, 0));

hRGB[2] = CreateSolidBrush(RGB(0, 0, 255));

hNull = CreateHatchBrush(HS\_CROSS, RGB(0, 125, 125));

memDC = CreateCompatibleDC(hDC);

hBMP = CreateCompatibleBitmap(hDC, thisWidth, thisHeight);

SelectObject(memDC, hBMP);

SetTimer(hWnd, 123456, 50, NULL);

break;

//界面绘图

case WM\_PAINT:

SelectObject(memDC, hNull);

Ellipse(memDC, cc.x - R, cc.y - R, cc.x + R, cc.y + R);

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

{

pt[i].x = (INT)(cc.x + R \* cos(PI \* (theta + i \* 120) / 180));

pt[i].y = (INT)(cc.y - R \* sin(PI \* (theta + i \* 120) / 180));

SelectObject(memDC, hRGB[i]);

Pie(memDC, (INT)((cc.x + pt[i].x - R) / 2),

(INT)((cc.y + pt[i].y - R) / 2),

(INT)((cc.x + pt[i].x + R) / 2),

(INT)((cc.y + pt[i].y + R) / 2),

cc.x, cc.y, pt[i].x, pt[i].y);

}

theta -= 20;

BitBlt(hDC, 0, 0, thisWidth, thisHeight, memDC, 0, 0, SRCCOPY);

break;

case WM\_TIMER:

InvalidateRect(hWnd, NULL, FALSE);

break;

//窗体销毁

case WM\_DESTROY:

PostQuitMessage(0);

KillTimer(hWnd, 123456);

DeleteObject(hRGB[0]);

DeleteObject(hRGB[1]);

DeleteObject(hRGB[2]);

DeleteObject(hNull);

DeleteObject(hBMP);

DeleteDC(memDC);

break;

default:

break;

}

return DefWindowProc(hWnd, message, wParam, lParam);

}

INT WINAPI WinMain(HINSTANCE hInstance, HINSTANCE hPrevInstance, LPTSTR lpCmdLine, int nCmdShow)

{

MSG msg;

WNDCLASSEX WC;//窗体类

INT ScreenWidth, ScreenHeight;//屏幕宽度、高度

INT i = 0;

WC.cbSize = sizeof(WNDCLASSEX);

WC.style = 0;

WC.lpfnWndProc = CtlProc;

WC.cbClsExtra = 0;

WC.cbWndExtra = 0;

WC.hInstance = hInstance;

WC.hIcon = 0;

WC.hCursor = 0;

WC.hbrBackground = (HBRUSH)GetSysColorBrush(COLOR\_BTNFACE);

WC.lpszMenuName = 0;

WC.lpszClassName = L"WND";

WC.hIconSm = 0;

ScreenWidth = GetSystemMetrics(SM\_CXSCREEN);

ScreenHeight = GetSystemMetrics(SM\_CYSCREEN);

RegisterClassEx(&WC);

hwnd = CreateWindow(L"WND", L"风扇", WS\_OVERLAPPEDWINDOW ^ WS\_THICKFRAME ^ WS\_MAXIMIZEBOX, (ScreenWidth - thisWidth) / 2, (ScreenHeight - thisHeight) / 2, thisWidth, thisHeight, NULL, 0, 0, 0);

ShowWindow(hwnd, 1);

UpdateWindow(hwnd);

while (GetMessage(&msg, NULL, 0, 0))

{

TranslateMessage(&msg);

DispatchMessage(&msg);

}

ReleaseDC(hwnd, hDC); //释放绘图DC

return 0;

}

绘图

#include<Windows.h>

#include<math.h>

#include<stdio.h>

#define SWAP(x,y) (x = x + y, y = x - y, x -= y)

//窗体尺寸信息

#define thisWidth 700//程序宽度

#define thisHeight 700//程序高度

HWND hwnd;//主窗体

HDC hDC;

PAINTSTRUCT ps;

INT selDraw = 0;//1:正在画椭圆 2:正在画矩形 3:画过椭圆 4:画过矩形

POINT dp1 = { 0,0 }, dp2 = { 0,0 };//左上右下

//窗体回调

LRESULT WINAPI CtlProc(HWND hWnd, UINT message, WPARAM wParam, LPARAM lParam)

{

INT i;

switch (message)

{

case WM\_LBUTTONDOWN:

if (wParam & MK\_CONTROL)

{

dp1.x = LOWORD(lParam);

dp1.y = HIWORD(lParam);

selDraw = 1;

}

else if (wParam & MK\_SHIFT)

{

dp1.x = LOWORD(lParam);

dp1.y = HIWORD(lParam);

selDraw = 2;

}

break;

case WM\_MOUSEMOVE:

if (selDraw == 1)

{

dp2.x = LOWORD(lParam);

dp2.y = HIWORD(lParam);

InvalidateRect(hWnd, NULL, TRUE);

UpdateWindow(hWnd);

Ellipse(hDC, dp1.x, dp1.y, dp2.x, dp2.y);

}

else if (selDraw == 2)

{

dp2.x = LOWORD(lParam);

dp2.y = HIWORD(lParam);

InvalidateRect(hWnd, NULL, TRUE);

UpdateWindow(hWnd);

Rectangle(hDC, dp1.x, dp1.y, dp2.x, dp2.y);

}

break;

case WM\_LBUTTONUP:

if (selDraw >= 1 && selDraw <= 2)

{

selDraw += 2;

if (dp1.x > dp2.x)

{

SWAP(dp1.x, dp2.x);

}

if (dp1.y > dp2.y)

{

SWAP(dp1.y, dp2.y);

}

}

break;

case WM\_KEYDOWN:

switch (wParam)

{

case VK\_RIGHT:

dp2.x += 10;

break;

case VK\_DOWN:

dp2.y += 10;

break;

case VK\_HOME:

dp2.x -= 10;

dp1.x -= 10;

break;

case VK\_END:

dp2.x += 10;

dp1.x += 10;

break;

case VK\_PRIOR:

dp2.y -= 10;

dp1.y -= 10;

break;

case VK\_NEXT:

dp2.y += 10;

dp1.y += 10;

break;

default:

break;

}

if (selDraw == 3)

{

InvalidateRect(hWnd, NULL, TRUE);

UpdateWindow(hWnd);

Ellipse(hDC, dp1.x, dp1.y, dp2.x, dp2.y);

}

else if (selDraw == 4)

{

InvalidateRect(hWnd, NULL, TRUE);

UpdateWindow(hWnd);

Rectangle(hDC, dp1.x, dp1.y, dp2.x, dp2.y);

}

break;

//窗体销毁

case WM\_DESTROY:

PostQuitMessage(0);

break;

default:

break;

}

return DefWindowProc(hWnd, message, wParam, lParam);

}

INT WINAPI WinMain(HINSTANCE hInstance, HINSTANCE hPrevInstance, LPTSTR lpCmdLine, int nCmdShow)

{

MSG msg;

WNDCLASSEX WC;//窗体类

INT ScreenWidth, ScreenHeight;//屏幕宽度、高度

INT i = 0;

WC.cbSize = sizeof(WNDCLASSEX);

WC.style = 0;

WC.lpfnWndProc = CtlProc;

WC.cbClsExtra = 0;

WC.cbWndExtra = 0;

WC.hInstance = hInstance;

WC.hIcon = 0;

WC.hCursor = 0;

WC.hbrBackground = (HBRUSH)GetSysColorBrush(COLOR\_BTNFACE);

WC.lpszMenuName = 0;

WC.lpszClassName = L"WND";

WC.hIconSm = 0;

ScreenWidth = GetSystemMetrics(SM\_CXSCREEN);

ScreenHeight = GetSystemMetrics(SM\_CYSCREEN);

RegisterClassEx(&WC);

hwnd = CreateWindow(L"WND", L"Paint", WS\_OVERLAPPEDWINDOW ^ WS\_THICKFRAME ^ WS\_MAXIMIZEBOX, (ScreenWidth - thisWidth) / 2, (ScreenHeight - thisHeight) / 2, thisWidth, thisHeight, NULL, 0, 0, 0);

hDC = GetDC(hwnd);

ShowWindow(hwnd, 1);

UpdateWindow(hwnd);

while (GetMessage(&msg, NULL, 0, 0))

{

TranslateMessage(&msg);

DispatchMessage(&msg);

}

return 0;

}

显示诗句

#include<Windows.h>

#include<math.h>

#include<stdio.h>

//窗体尺寸信息

#define thisWidth 700//程序宽度

#define thisHeight 700//程序高度

#define PI 3.1415926

HWND hwnd;//主窗体

POINT pt[10], cc = { 350,350 };//各点坐标、圆心坐标

INT R = 200;//文字半径

INT theta = 0;//旋转角度

HDC hDC;

PAINTSTRUCT ps;

TCHAR poem[] = L"欲穷千里目更上一层楼";

HANDLE hFont;

//窗体回调

LRESULT WINAPI CtlProc(HWND hWnd, UINT message, WPARAM wParam, LPARAM lParam)

{

INT i;

switch (message)

{

case WM\_CREATE:

hFont = CreateFont(20,20,0,0,FW\_NORMAL,FALSE,FALSE,0,ANSI\_CHARSET, OUT\_DEFAULT\_PRECIS,CLIP\_DEFAULT\_PRECIS,DEFAULT\_QUALITY,DEFAULT\_PITCH | FF\_SWISS,L"宋体");

SetTimer(hWnd, 123456, 100, NULL);

break;

case WM\_TIMER:

InvalidateRect(hWnd, NULL, TRUE);

break;

//界面绘图

case WM\_PAINT:

hDC = BeginPaint(hWnd, &ps);

SetBkMode(hDC, TRANSPARENT);

SelectObject(hDC, hFont);

for (i = 0; i < 10; i++)

{

pt[i].x = (INT)(cc.x + R \* cos(PI \* (theta - i \* 36) / 180));

pt[i].y = (INT)(cc.y - R \* sin(PI \* (theta - i \* 36) / 180));

TextOut(hDC, pt[i].x, pt[i].y, poem + i, 1);

SetTextColor(hDC, RGB(220 - i \* 15, 0, 0));

}

theta += 5;

EndPaint(hWnd, &ps);

break;

//窗体销毁

case WM\_DESTROY:

PostQuitMessage(0);

break;

default:

break;

}

return DefWindowProc(hWnd, message, wParam, lParam);

}

INT WINAPI WinMain(HINSTANCE hInstance, HINSTANCE hPrevInstance, LPTSTR lpCmdLine, int nCmdShow)

{

MSG msg;

WNDCLASSEX WC;//窗体类

INT ScreenWidth, ScreenHeight;//屏幕宽度、高度

INT i = 0;

WC.cbSize = sizeof(WNDCLASSEX);

WC.style = 0;

WC.lpfnWndProc = CtlProc;

WC.cbClsExtra = 0;

WC.cbWndExtra = 0;

WC.hInstance = hInstance;

WC.hIcon = 0;

WC.hCursor = 0;

WC.hbrBackground = (HBRUSH)GetSysColorBrush(COLOR\_BTNFACE);

WC.lpszMenuName = 0;

WC.lpszClassName = L"WND";

WC.hIconSm = 0;

ScreenWidth = GetSystemMetrics(SM\_CXSCREEN);

ScreenHeight = GetSystemMetrics(SM\_CYSCREEN);

RegisterClassEx(&WC);

hwnd = CreateWindow(L"WND", L"欲穷千里目更上一层楼", WS\_OVERLAPPEDWINDOW ^ WS\_THICKFRAME ^ WS\_MAXIMIZEBOX, (ScreenWidth - thisWidth) / 2, (ScreenHeight - thisHeight) / 2, thisWidth, thisHeight, NULL, 0, 0, 0);

ShowWindow(hwnd, 1);

UpdateWindow(hwnd);

while (GetMessage(&msg, NULL, 0, 0))

{

TranslateMessage(&msg);

DispatchMessage(&msg);

}

ReleaseDC(hwnd, hDC); //释放绘图DC

return 0;

}