ST. XAVIER’S COLLEGE

**Maitighar, Kathmandu**

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**Computer Graphics**

**Lab Assignment #9**

**SUBMITTED BY:**

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**SUBMITTED TO**

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Submission Date: 8th September 2015

**OBJECTIVE 9.1: TO SHEAR AN IMAGE**

|  |
| --- |
| **SOURCE CODE:** |
| //--------------------------------------------------------------------------- |
| #include <vcl\vcl.h> |
| #pragma hdrstop |
| #include "Trans.h" |
| #include <math.h> |
| //--------------------------------------------------------------------------- |
| #pragma resource "\*.dfm" |
| TForm2 \*Form2; |
| int x,y,i,j,Tx,Ty,theta,shx,shy,ix,jy; |
| float t; |
| //--------------------------------------------------------------------------- |
| \_\_fastcall TForm2::TForm2(TComponent\* Owner) |
| : TForm(Owner) |
| { |
| } |
| //--------------------------------------------------------------------------- |
| void \_\_fastcall TForm2::TranslateClick(TObject \*Sender) |
| { |
| x=Image1->Height; |
| y=Image1->Width; |
| Tx=StrToInt(TX->Text); |
| Ty=StrToInt(TY->Text); |
| for(i=0;i<=x;i++){ |
| for(j=0;j<=y;j++){ |
| Image2->Canvas->Pixels[i+Tx][j+Ty]=Image1->Canvas->Pixels[i][j]; |
| } |
| } |
| } |
| //--------------------------------------------------------------------------- |
| void \_\_fastcall TForm2::RotateClick(TObject \*Sender) |
| { |
| x=Image1->Height; |
| y=Image1->Width; |
| theta=StrToInt(Theta->Text); |
| for(i=0;i<x;i++){ |
| for(j=0;j<y;j++){ |
| Image2->Canvas->Pixels[300+i\*cos(theta)-j\*sin(theta)][200+i\*sin(theta)+j\*cos(theta)]=Image1->Canvas->Pixels[i][j]; |
| } |
| } |
| } |
| //--------------------------------------------------------------------------- |
| void \_\_fastcall TForm2::Button1Click(TObject \*Sender) |
| { |
| x=Image1->Height; |
| y=Image1->Width; |
| t=StrToFloat(T->Text); |
| for(i=0;i<=x;i++){ |
| for(j=0;j<=y;j++){ |
| Image2->Canvas->Pixels[i\*t][j\*t]=Image1->Canvas->Pixels[i][j]; |
| } |
| } |
| } |
| //--------------------------------------------------------------------------- |
| void \_\_fastcall TForm2::ShearXClick(TObject \*Sender) |
| { |
| x=Image1->Height; |
| y=Image1->Width; |
| shx=StrToFloat(SHX->Text); |
| for(i=0;i<=x;i++){ |
| for(j=0;j<=y;j++){ |
| Image2->Canvas->Pixels[i+shx\*j][j]=Image1->Canvas->Pixels[i][j]; |
| } |
| } |
|  |
| } |
| //--------------------------------------------------------------------------- |
| void \_\_fastcall TForm2::ShearYClick(TObject \*Sender) |
| { |
| x=Image1->Height; |
| y=Image1->Width; |
| shy=StrToFloat(SHY->Text); |
| for(i=0;i<=x;i++){ |
| for(j=0;j<=y;j++){ |
| Image2->Canvas->Pixels[i][shy\*i+j]=Image1->Canvas->Pixels[i][j]; |
| } |
| } |
| } |
| //--------------------------------------------------------------------------- |

**OUTPUT:**

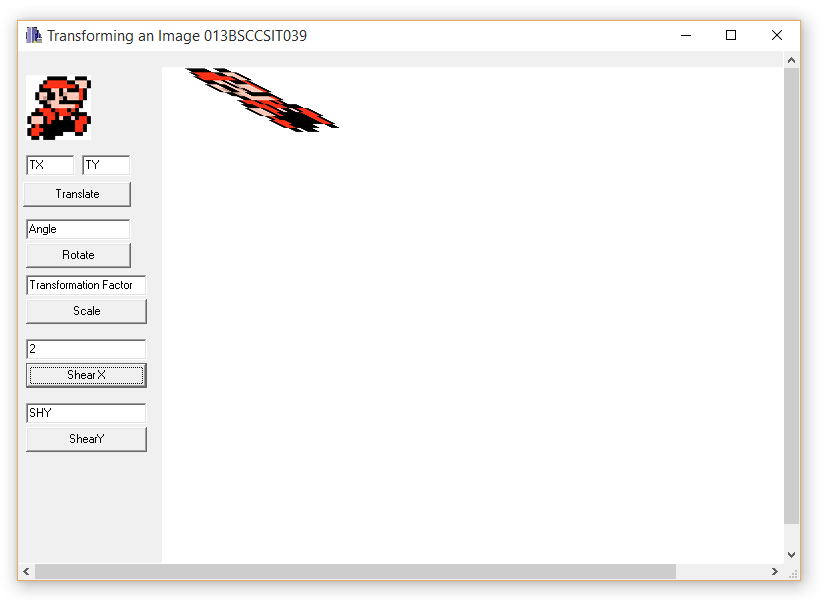


Fig: Shearing an image of Mario in the X direction at Shx=2

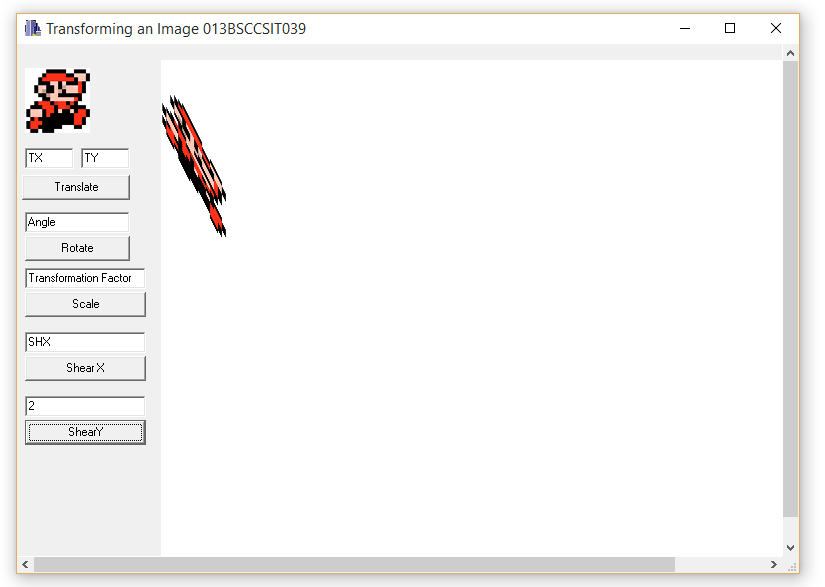


Fig: Shearing an image of Mario in the Y direction at Shy=2

**CONCLUSION:**

The program could transform a sample image in various ways. It is possible to shear an image with simple set of codes that modify the whole image viewport on which the image is located.