

## **Lab1 Manipulation & processing of image in visual basic**

### **1) Copy image**

```
Private sub command1_click()  
Dim color as long  
for x = 0 to 180  
for y = 0 to 160  
color = getpixel(Picture1.hdc,x,y)  
r = color mod 256  
color = color/256  
g = color mod 256  
color = color/256  
b = color  
setpixel picture2.hdc,x,y,RGB(r,g,b)  
Next y  
Next x  
End Sub
```

### **2) Negative Image**

```
Private Sub Command2_click()  
Dim color as Long  
For x = 0 to 180  
For y = 0 to 180  
color = getpixel(picture1.hdc,x,y)  
r = color mod 256  
color = color/256  
g = color mod 256  
color = color /256  
b = color  
setpixel picture3.hdc,x,y,RGB(255-r,255-g,255-b)
```

```
Next y
Next x
End Sub
```

### **3) Horizontal image //rgb chalaunu parena image lai horizontal flip garne matra tw honi**

```
Private sub command3_click()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = getpixel(picture1.hdc,x,y)
setpixel picture4.hdc,255-x,y,color
Next y
Next x
End Sub
```

### **4) Vertical image //same tara y lai flip**

```
Private sub command4_click()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = getpixel(picture1.hdc,x,y)
setpixel picture5.hdc,x,255-y,color
Next y
Next x
End Sub
```

### **5) Grey image**

```

Private sub command5_click()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = getpixel(picture1.hdc,x,y)
r = color mod 256
color = color/256
g = color mod 256
color = color / 256
b = color
Grey = (r+g+b)/3
setpixel picture6.hdc,x,y,RGB(Grey,Grey,Grey)
Next y
Next x
End Sub

```

## **lab2 (Dealing with RGB image processing)**

### **1) Red Horizontal scrollbar**

```

Private sub HScroll1_Change()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = GetPixel(Picture1.hdc,x,y)
r = color Mod 256
color = color / 256
g = color Mod 256
color = color / 256
b = color

```

```
setpixel Picture2.hdc,x,y,RGB(r + HScroll1.Value, g, b)
Next y
Next x
End Sub
```

## **2) Green Horizontal Scrollbar**

```
Private sub HScroll2_Change()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = GetPixel(picture1.hdc,x,y)
r = color Mod 256
color = color / 256
g = color Mod 256
color = color / 256
b = color
setpixel picture2.hdc,x,y,RGB(r, g + HScroll2.Value, b)
Next y
Next x
End Sub
```

## **3) Blue Horizontal Bar**

```
Private sub HScroll3_Change()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = GetPixel(picture1.hdc,x,y)
r = color Mod 256
```

```
color = color/256
g = color Mod 256
color = color/256
b = color
setpixel Picture2.hdc,x,y,RGB(r, g, b + HScroll3.Value)
Next y
Next x
End Sub
```

#### **4) Brightness horizontal bar**

```
Private Sub HScroll_Change()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = GetPixel(picture1.hdc,x,y)
r = color Mod 256
color = color / 256
g = color Mod 256
color = color / 256
b = color
setpixel Picture2.hdc,x,y,RGB(r + HScroll4.Value, g + HScroll4.Value, b + HScroll4.Value)
Next y
Next x
End Sub
```

## **Lab3 Intensity Level Slicing, Bit Plane Slicing and zooming by replication**

### **1) Intensity level slicing with background**

```
Private Sub Option1_Click()  
Dim color as Long  
For x = 0 to 180  
For y = 0 to 180  
color = GetPixel(Picture1.hdc,x,y)  
r = color Mod 256  
color = color / 256  
g = color Mod 256  
color = color / 256  
b = color  
If r > 127 and r < 250 Then r = 256 - r Else r = r  
If g > 127 and g < 250 Then g = 256 - g Else g = g  
If b > 127 and b < 250 Then b = 256 - b Else b = b  
SetPixel Picture2.hdc,x,y,RGB(r,g,b)  
Next y  
Next x  
End Sub
```

### **2) Intensity level slicing Without background**

```
Private Sub Option2_Click()  
Dim color as Long  
For x = 0 to 180  
For y = 0 to 180  
color = GetPixel(Picture1.hdc,x,y)  
r = color Mod 256  
color = color / 256
```

```

g = color Mod 256
color = color / 256
b = color
If r > 127 and r < 255 Then r = 255-r Else r = 0
If g > 127 and g < 255 Then g = 255-g Else g = 0
If b > 127 and b < 255 Then b = 255-b Else b = 0
SetPixel Picture2.hdc,x,y,RGB(r,g,b)
Next y
Next x
End Sub

```

### 3) Bit plane slicing

```

Private Sub Command1_Click()
Dim color as Long
For x = 0 to 180
For y = 0 to 180
color = GetPixel(Picture1.hdc,x,y)
r = color Mod 256
color = color / 256
g = color Mod 256
color = color / 256
b = color

n = Text1.Text

If (n<0) Then
n = 0
Text1.Text = 0
End If

```

If (n>7) Then

n = 7

Text1.Text = 7

End If

If (r > (2^n)-1) Then

r = 255

Else

r = 0

End If

If (g > (2^n)-1) Then

g = 255

Else

g = 0

End If

If (b > (2^n)-1) Then

b = 255

Else

b = 0

End If

SetPixel Picture2.hdc,x,y,RGB(r,g,b)

Next y

Next x

End Sub



#### **4) Zooming by replication**

```
Private Sub Command2_click()  
Dim Color as Long  
Picture2.Height = Picture1.Height * 2  
Picture2.Width = Picture1.Width * 2  
For x = 0 to 180 * 2  
For y = 0 to 180 * 2  
color = GetPixel(Picture1.hdc,x/2,y/2)  
SetPixel Picture2.hdc,x,y,color  
Next y  
Next x  
End Sub
```

#### **5) Zooming by interpolation**

```
Private Sub Command3_Click()  
Dim color1 as Long  
Dim color2 as Long  
Dim Gray as Long  
  
For x = 0 to 180 * 2  
For y = 0 to 180 * 2  
If (x mod 2 = 0) Then  
color = GetPixel(Picture1.hdc,x/2,y/2)  
Gray = color And 255  
SetPixel Picture2.hdc, x, y, RGB(Gray,Gray,Gray)  
End If  
Next y  
Next x
```

```

For x = 0 to 180 * 2
For y = 0 to 180 * 2
color1 = GetPixel(Picture1.hdc,x-1,y) and 255
color2 = GetPixel(Picture2.hdc, x+1,y) and 255
Gray = (color1 + color2) /2
SetPixel Picture2.hdc, 2*x, 2*y+1, RGB(Gray,Gray,Gray)
Next y
Next x

```

```

For x = 0 to 180 * 2
For y = 0 to 180 * 2
color1 = GetPixel(Picture1.hdc,x-1,y) and 255
color2 = GetPixel(Picture2.hdc, x+1,y) and 255
Gray = (color1 + color2) /2
SetPixel Picture2.hdc, 2*x+1, 2*y, RGB(Gray,Gray,Gray)
Next y
Next x

```

End Sub

## **Lab4 Mean Filter and Weighted Mean Filter**

### **1) Mean Filter**

```
Private Sub Command1_Click()
```

```
Dim Color as Long
```

```
Dim rr as Long
```

```
Dim gg as Long
```

```
Dim bb as Long
```

```
For x = 0 to 180
```

```
For y = 0 to 180
```

```
color = GetPixel(Picture1.hdc,x,y)
```

```
r = color Mod 256
```

```
color = color/256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x-1,y+1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x,y+1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x+1,y+1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x+1,y)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x+1,y-1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x,y-1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x-1,y-1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x-1,y)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
If (rr<0) Then rr = 0 Else If rr>255 Then rr = 255
If (gg<0) Then gg = 0 Else If gg>255 Then gg = 255
If (bb <0) Then bb = 0 Else If bb>255 Then bb = 255
```

```
SetPixel Picture2.hdc,x,y,RGB(rr,gg,bb)
Next y
Next x
End Sub
```

## **2) Weighted Mean Filter**

```
Private Sub Command2_Click()
Dim color as Long
Dim rr as Long
Dim gg as Long
Dim bb as Long
For x = 0 to 180
For y = 0 to 180
```

```
color = GetPixel(Picture1.hdc,x,y)
r = color Mod 256
color = color / 256
g = color Mod 256
color = color / 256
b = color
rr = 4 * r
gg = 4 * g
bb = 4 * b
```

```
color = GetPixel(Picture1.hdc,x-1,y)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + 2 * r
```

```
gg = gg + 2 * g
```

```
bb = bb + 2 * b
```

```
color = GetPixel(Picture1.hdc,x+1,y)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + 2 * r
```

```
gg = gg + 2 * g
```

```
bb = bb + 2 * b
```

```
color = GetPixel(Picture1.hdc,x,y-1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + 2 * r
```

```
gg = gg + 2 * g
```

```
bb = bb + 2 * b
```

```
color = GetPixel(Picture1.hdc,x,y+1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + 2 * r
```

```
gg = gg + 2 * g
```

```
bb = bb + 2 * b
```

```
color = GetPixel(Picture1.hdc,x-1,y+1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x+1,y+1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```



```
color = GetPixel(Picture1.hdc,x+1,y-1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
color = GetPixel(Picture1.hdc,x-1,y-1)
```

```
r = color Mod 256
```

```
color = color / 256
```

```
g = color Mod 256
```

```
color = color / 256
```

```
b = color
```

```
rr = rr + r
```

```
gg = gg + g
```

```
bb = bb + b
```

```
rr = rr * (1/9)
```

```
gg = gg * (1/9)
```

```
bb = bb * (1/9)
```

```
If (rr<0) Then rr = 0 Else If rr > 255 Then rr = 255
```

```
If (gg<0) Then gg = 0 Else If gg > 255 Then gg = 255
```

```
If (bb<0) Then bb = 0 Else If bb > 255 Then bb = 255
```

```
SetPixel Picture2.hdc, x, y, RGB(rr,gg,bb)
```

Next y  
Next x  
End Sub

## **Lab6 Implementation of Line Detection**

**'For Horizontal Line Detection'**

**'-1 -1 -1'**

**' 2 2 2'**

**'-1 -1 -1'**

Private Sub Command1\_Click()

Dim Color As Long

Dim rr As Long

Dim gg As Long

Dim bb As Long

For x = 0 To 180

For y = 0 To 180

Color = GetPixel(Picture1.hdc, x, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = 2 \* r

gg = 2 \* g

bb = 2 \* b

Color = GetPixel(Picture1.hdc, x - 1, y + 1)

r = Color Mod 256

Color = Color / 256

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr - r$

$gg = gg - g$

$bb = bb - b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x, y + 1)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr - r$

$gg = gg - g$

$bb = bb - b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x + 1, y + 1)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr - r$

$gg = gg - g$

$bb = bb - b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x + 1, y)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr + 2 * r$

$gg = gg + 2 * g$

$bb = bb + 2 * b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x + 1, y - 1)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr - r$

$gg = gg - g$

$bb = bb - b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x, y - 1)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr - r$

$gg = gg - g$

$bb = bb - b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x - 1, y - 1)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x - 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255

If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255

If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255

SetPixel Picture2.hdc, x, y, RGB(rr, gg, bb)

Next y

Next x

End Sub

**'For Vertical Line Detection'**

**'-1 2 -1'**

**'-1 2 -1'**

**'-1 2 -1'**

```
Private Sub Command2_Click()
```

```
Dim Color As Long
```

```
Dim rr As Long
```

```
Dim gg As Long
```

```
Dim bb As Long
```

```
For x = 0 To 180
```

```
For y = 0 To 180
```

```
Color = GetPixel(Picture1.hdc, x, y)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = 2 * r
```

```
gg = 2 * g
```

```
bb = 2 * b
```

```
Color = GetPixel(Picture1.hdc, x - 1, y + 1)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = rr - r
```

```
gg = gg - g
```

```
bb = bb - b
```

```
Color = GetPixel(Picture1.hdc, x, y + 1)
```

```
r = Color Mod 256
```

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x + 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x - 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x - 1, y)

r = Color Mod 256



Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255

If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255

If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255

SetPixel Picture3.hdc, x, y, RGB(rr, gg, bb)

Next y

Next x

End Sub

**'For +45 Line Detection'**

**'-1 -1 2'**

**'-1 2 -1'**

**'2 -1 -1'**

Private Sub Command3\_Click()

Dim Color As Long

Dim rr As Long

Dim gg As Long

Dim bb As Long

For x = 0 To 180

For y = 0 To 180

Color = GetPixel(Picture1.hdc, x, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = 2 \* r

gg = 2 \* g

bb = 2 \* b

Color = GetPixel(Picture1.hdc, x - 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x + 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x - 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x - 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

```
If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255
If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255
If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255
```

```
SetPixel Picture4.hdc, x, y, RGB(rr, gg, bb)
```

```
Next y
```

```
Next x
```

```
End Sub
```

```
'For -45 Line Detection'
```

```
' 2 -1 -1'
```

```
'-1 2 -1'
```

```
'-1 -1 2'
```

```
Private Sub Command4_Click()
```

```
Dim Color As Long
```

```
Dim rr As Long
```

```
Dim gg As Long
```

```
Dim bb As Long
```

```
For x = 0 To 180
```

```
For y = 0 To 180
```

```
Color = GetPixel(Picture1.hdc, x, y)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = 2 * r
```

```
gg = 2 * g
```

```
bb = 2 * b
```

Color = GetPixel(Picture1.hdc, x - 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

```
Color = GetPixel(Picture1.hdc, x - 1, y - 1)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = rr - r
```

```
gg = gg - g
```

```
bb = bb - b
```

```
Color = GetPixel(Picture1.hdc, x - 1, y)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = rr - r
```

```
gg = gg - g
```

```
bb = bb - b
```

```
If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255
```

```
If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255
```

```
If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255
```

```
SetPixel Picture5.hdc, x, y, RGB(rr, gg, bb)
```

```
Next y
```

```
Next x
```

```
End Sub
```

```
Private Sub Command5_Click()
```



**'For Laplacian'**

**' 0 -1 0'**

**'-1 4 -1'**

**' 0 -1 0'**

Dim Color As Long

Dim rr As Long

Dim gg As Long

Dim bb As Long

For x = 0 To 180

For y = 0 To 180

Color = GetPixel(Picture1.hdc, x, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = 4 \* r

gg = 4 \* g

bb = 4 \* b

Color = GetPixel(Picture1.hdc, x, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x - 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

```
rr = rr - r
```

```
gg = gg - g
```

```
bb = bb - b
```

```
If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255
```

```
If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255
```

```
If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255
```

```
SetPixel Picture6.hdc, x, y, RGB(rr, gg, bb)
```

```
Next y
```

```
Next x
```

```
End Sub
```

```
'For Sobel X-Filter'
```

```
'-1 0 1'
```

```
'-2 0 2'
```

```
'-1 0 1'
```

```
Private Sub Command6_Click()
```

```
Dim Color As Long
```

```
Dim rr As Long
```

```
Dim gg As Long
```

```
Dim bb As Long
```

```
For x = 0 To 180
```

```
For y = 0 To 180
```

```
Color = GetPixel(Picture1.hdc, x - 1, y + 1)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + r

gg = gg + g

bb = bb + b

Color = GetPixel(Picture1.hdc, x + 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x + 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + r

gg = gg + g

bb = bb + b

Color = GetPixel(Picture1.hdc, x - 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x - 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - 2 \* r

gg = gg - 2 \* g

bb = bb - 2 \* b

If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255

If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255

If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255

```
SetPixel Picture7.hdc, x, y, RGB(rr, gg, bb)
```

```
Next y
```

```
Next x
```

```
End Sub
```

```
Private Sub Command7_Click()
```

```
'For Sobel Y-Filter'
```

```
'-1 -2 -1'
```

```
' 0  0  0'
```

```
' 1  2  1'
```

```
Dim Color As Long
```

```
Dim rr As Long
```

```
Dim gg As Long
```

```
Dim bb As Long
```

```
For x = 0 To 180
```

```
For y = 0 To 180
```

```
Color = GetPixel(Picture1.hdc, x - 1, y + 1)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = rr - r
```

```
gg = gg - g
```

```
bb = bb - b
```

```
Color = GetPixel(Picture1.hdc, x, y + 1)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr - 2 * r$

$gg = gg - 2 * g$

$bb = bb - 2 * b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x + 1, y + 1)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr - r$

$gg = gg - g$

$bb = bb - b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x + 1, y - 1)$

$r = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$g = \text{Color Mod } 256$

$\text{Color} = \text{Color} / 256$

$b = \text{Color}$

$rr = rr + r$

$gg = gg + g$

$bb = bb + b$

$\text{Color} = \text{GetPixel}(\text{Picture1.hdc}, x, y - 1)$

$r = \text{Color Mod } 256$

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + 2 \* r

gg = gg + 2 \* g

bb = bb + 2 \* b

Color = GetPixel(Picture1.hdc, x - 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + r

gg = gg + g

bb = bb + b

If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255

If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255

If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255

SetPixel Picture8.hdc, x, y, RGB(rr, gg, bb)

Next y

Next x

End Sub



**'For Prewit X Filter'**

**'-1 0 1'**

**'-1 0 1'**

**'-1 0 1'**

Private Sub Command8\_Click()

Dim Color As Long

Dim rr As Long

Dim gg As Long

Dim bb As Long

For x = 0 To 180

For y = 0 To 180

Color = GetPixel(Picture1.hdc, x - 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y + 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

$rr = rr + r$

$gg = gg + g$

$bb = bb + b$

$Color = \text{GetPixel}(\text{Picture1.hdc}, x + 1, y)$

$r = Color \bmod 256$

$Color = Color / 256$

$g = Color \bmod 256$

$Color = Color / 256$

$b = Color$

$rr = rr + r$

$gg = gg + g$

$bb = bb + b$

$Color = \text{GetPixel}(\text{Picture1.hdc}, x + 1, y - 1)$

$r = Color \bmod 256$

$Color = Color / 256$

$g = Color \bmod 256$

$Color = Color / 256$

$b = Color$

$rr = rr + r$

$gg = gg + g$

$bb = bb + b$

$Color = \text{GetPixel}(\text{Picture1.hdc}, x - 1, y - 1)$

$r = Color \bmod 256$

$Color = Color / 256$

$g = Color \bmod 256$

$Color = Color / 256$

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x - 1, y)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255

If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255

If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255

SetPixel Picture9.hdc, x, y, RGB(rr, gg, bb)

Next y

Next x

End Sub

**'For Prewit Y Filter'**

**'-1 -1 -1'**

**' 0 0 0'**

**' 1 1 1'**

```
Private Sub Command9_Click()
```

```
Dim Color As Long
```

```
Dim rr As Long
```

```
Dim gg As Long
```

```
Dim bb As Long
```

```
For x = 0 To 180
```

```
For y = 0 To 180
```

```
Color = GetPixel(Picture1.hdc, x - 1, y + 1)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = rr - r
```

```
gg = gg - g
```

```
bb = bb - b
```

```
Color = GetPixel(Picture1.hdc, x, y + 1)
```

```
r = Color Mod 256
```

```
Color = Color / 256
```

```
g = Color Mod 256
```

```
Color = Color / 256
```

```
b = Color
```

```
rr = rr - r
```

```
gg = gg - g
```

```
bb = bb - b
```

```
Color = GetPixel(Picture1.hdc, x + 1, y + 1)
```

```
r = Color Mod 256
```

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr - r

gg = gg - g

bb = bb - b

Color = GetPixel(Picture1.hdc, x + 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + r

gg = gg + g

bb = bb + b

Color = GetPixel(Picture1.hdc, x, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + r

gg = gg + g

bb = bb + b

Color = GetPixel(Picture1.hdc, x - 1, y - 1)

r = Color Mod 256

Color = Color / 256

g = Color Mod 256

Color = Color / 256

b = Color

rr = rr + r

gg = gg + g

bb = bb + b

If (rr < 0) Then rr = 0 Else If rr > 255 Then rr = 255

If (gg < 0) Then gg = 0 Else If gg > 255 Then gg = 255

If (bb < 0) Then bb = 0 Else If bb > 255 Then bb = 255

SetPixel Picture10.hdc, x, y, RGB(rr, gg, bb)

Next y

Next x

End Sub