RIGA TECHNICAL UNIVERSITY

FACULTY OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Fundamentals of Computer Graphics and Image Processing

Practical Work #1

Straight line algorithm

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1. Task of Work

Contains the task of work

2. Programming Code

Contains the programming code of the program

3. Screen Shots

Contains screen shots that prove the correct work of the program

- During class you will be given the first half of the Bresenham algorithm that can draw straight horizontal lines (where dx>dy), complete this algorithm so that it could draw straight vertical lines (where dy>dx).

- Use the Bresenham algorithm to draw the last 3 digits of your student ID number using multiple straight lines (for example, if your student ID number is 200RDB153, then you have to draw the digits 153).

CODE//

```python
import numpy as np
import matplotlib.pyplot as plt
img = np.ones((600,600,3))

def DrawLine(x1, y1, x2, y2):
    dx = abs(x2-x1)
    dy = abs(y2-y1)

    if(x1<x2):
        xs = 1;
    else:
        xs = -1;

    if(y1<y2):
        ys = 1;
    else:
        ys = -1;

    x=x1;
    y=y1;

    if(dx>=dy):
        p=2*dy-dx;
        while(x!=x2):
            x=x+xs;
            if(p>0):
                y=y+ys;
                p=p+2*dy-2*dx;
            else:
                p=p+2*dy;

            img[y,x] = 0;
    else:
        p=2*dx-dy;
```

```
    while(y!=y2):
        y=y+ys
        if(p>0):
            x=x+xs;
            p=p+2*dx-2*dy;
        else:
            p=p+2*dx;

        img[y,x] = 0;
    return;

#201ADB100 is my id
#100

#draw 1
DrawLine(30,300, 100, 200)
DrawLine(100,200, 100, 400)
#draw 0
DrawLine(200,400, 300, 400)
DrawLine(199,199, 299, 199)
DrawLine(199,399, 199, 199)
DrawLine(298,398, 298, 198)

DrawLine(400,400, 500, 400)
DrawLine(399,199, 499, 199)
DrawLine(400,400, 400, 200)
DrawLine(499,400, 499, 200)
plt.imshow(img);
plt.show();
```

```
#201ADB100 is my id
#100
#draw 1
DrawLine(30,300, 100, 200)
DrawLine(100,200, 100, 400)
#draw 0
DrawLine(200,400, 300, 400)
DrawLine(199,199, 299, 199)
DrawLine(199,399, 199, 199)
DrawLine(298,398, 298, 198)
#draw 0
DrawLine(400,400, 500, 400)
DrawLine(399,199, 499, 199)
DrawLine(400,400, 400, 200)
DrawLine(499,400, 499, 200)
plt.imshow(img);
plt.show();
```