Assignment No. A(5)

DATE:

Problem statement: Write C++/Java program to draw a 4x4 chessboard rotated 45° with horizontal axis. Use Bresenham algorithm to draw all the lines. Use seed fill algo. to fill black squares of rotated chessboard.

Learning objective: To understand basic rotation transformation and seed fill algo for chessboard 4x4.

Learning outcome: We will able to do rotation and fill chessboard with seed fill algorithm

Requirements: Fedora 20, QT Creator

Theory:
Seedfill - It is also called as flood fill, forest fire fill. In seed fill it starts with point on seed which must be surely inside the polygon. If yes, fill that pixel with new color, else if colour of pixel already changed then return to its colour. It is useful when rotation / region or polygon has no uniform coloured boundaries.

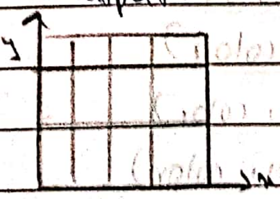
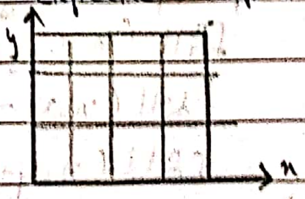
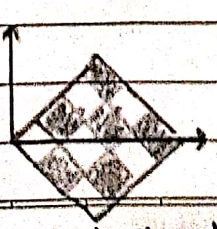
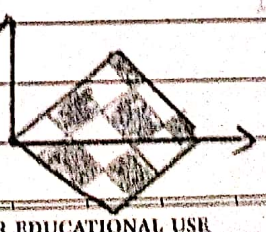
Algo :
```
ffill (x,y, new color){
        current = getpixel (x,y);
            if (current != new color)
            { putpixel (x,y,newcolor)
                ffill (x-1, y, new color)
                ffill (x,y-1, new color)
                ffill (x,y+1, new color)
            }
    }
```

Rotation Algo :

```
void rotate( ) {
    int theta
        Read theta and '1' for clockwise and '0' for anticlockwise
      theta = (3.14 * theta/180)
      if (clockw == 1)
      {  rot[1][1] = rot[2][2] = cos(theta);
           rot[1][2] = -sin(theta);
           rot[2][1] = -sin(theta);
      }

      else {
          rot[1][1] = rot[2][2] = cos(theta);
          rot[1][2] = sin(theta);
           rot[2][1] = -sin(theta);
      }
    for (i=1 to edges)
    {  resm[1][1] = a[1][1] * rot[1][1] + (a[1][2] * rot[2][1]) + 320 ;
        resm[1][2] = (a[1][1] * rot[1][2]) + (a[1][2] * rot[2][2]) + (-240)
    }
    plot(resm)
  }
```

Test Cases:

Description	Output	Expected Output	Result
1) Draw			Pass
2) Rotate			Pass

Conclusion: Thus, we implement filling of rotated chessboard 4x4 and understood rotation transformation and seed fill algorithm.