Expt No. B2

Assignment No. 5

Title :- Polygon filling (flood fill)

Problem statement :-

Write the c++ program to draw the polygon by using the mouse. Choose colors by clicking on designed color pane. Use window port to draw. use DDA algorithm for line drawing.

Objective :-

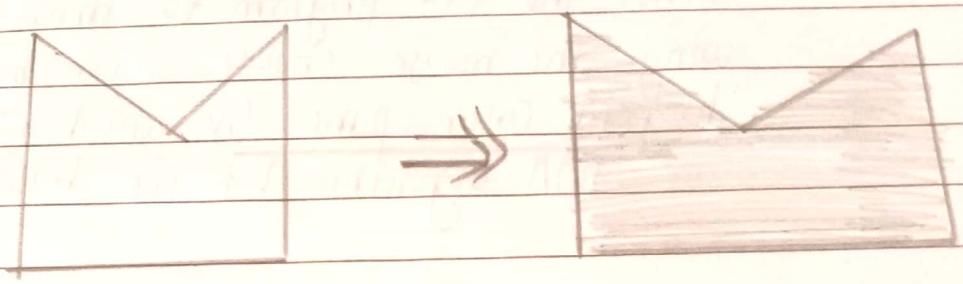
- To understand & study polygon filling algorithm.
- To study the different polygon filling algorithm
- To understand & study different concepts & feature of OOP.
- To understand & study different manipulation facilities in QT creator in c++.

Software & hw requirement :-

Linux based os.
QT creator.

Theory :-

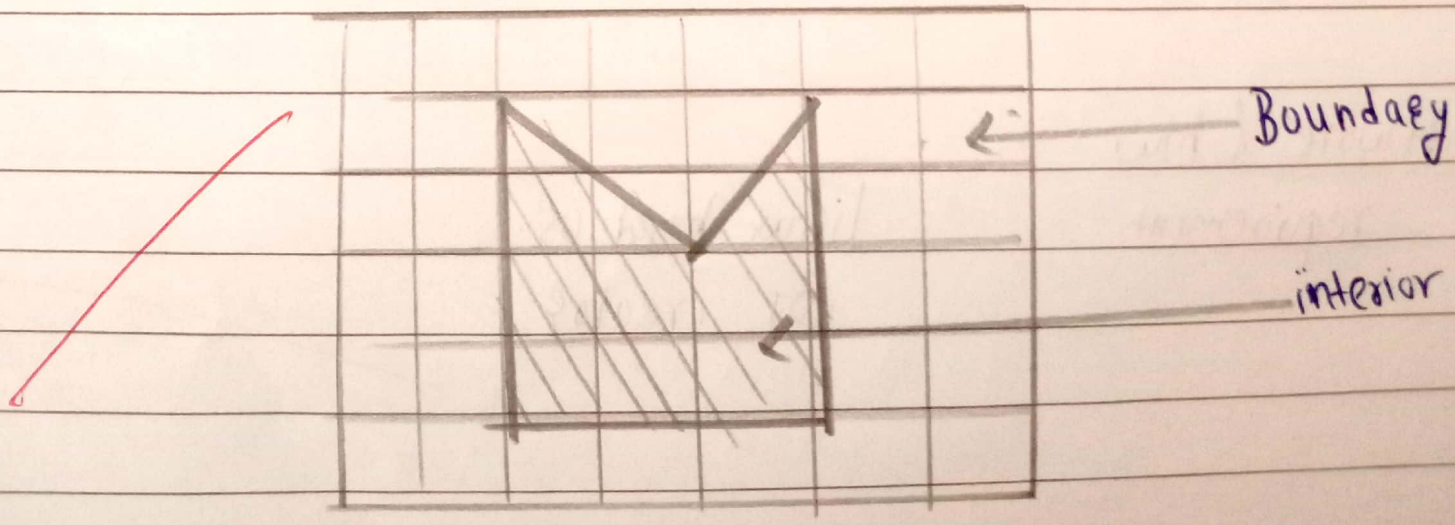
- **Polygon filling** :- process of colouring the area of polygon is polygon filling.



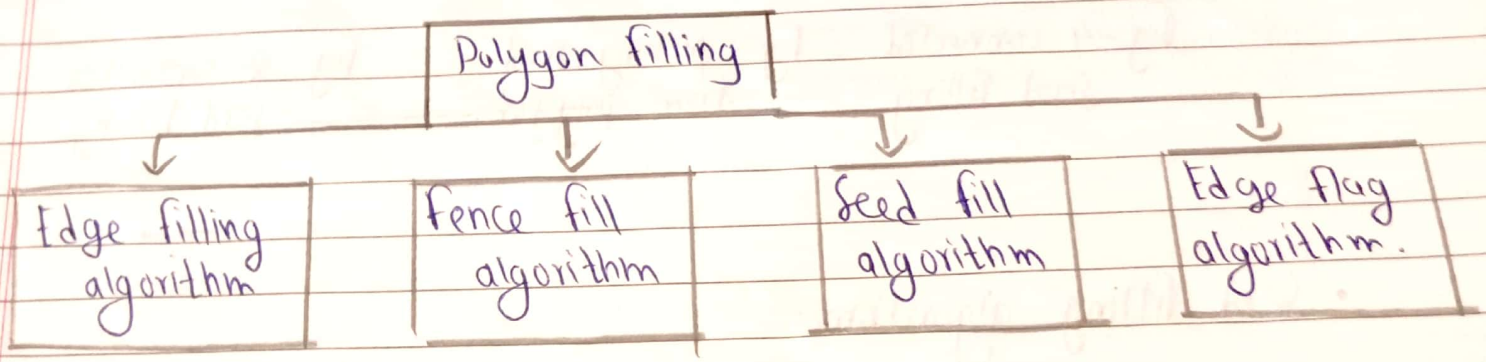
- Filling the polygon means highlighting all the pixels which lie inside the polygon with any colour other than background.

- **Types of regions** :-

i) Boundary defined region :-
ii) Interior defined region :-



- It is collection of same colour pixels [Exterior pixels have different colour.
- algorithm used to fill those region are called flood fill algorithm.



- Boundary & flood fill algorithm together is called seed fill algorithm
- Starts at sample pixel called as a seed pixel from the area, fill the color value & the boundary color value.
- It is pixel-level approach.
- We can get pixel using getpixel(), setpixel() methods.
- It is recursive algorithm.

fig:- 4-connected seed filling

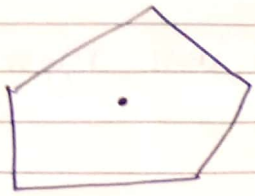


fig:- picking seed from polygon

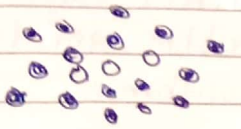


fig:- 8- connected seed filling

- Seed filling algorithm:-

i) Draw the edge of polygon in frame buffer.
ii) Start with seed point which is inside the polyg
iii) Set the intensity to interior style & examine neighbouring pixel.
iv) Continue until boundary pixel.

- Boundary / flood fill

Check for boundary color pixel in

i) Four-connected region.
ii) eight-connected region.

- Flood - Fill algorithm

i) Useful to fill the area i.e not defined within a single colour boundary.

ii) This fills area by replacing a specified interior colour instead of searching for boundary value.

- Pseudocode :

```
Algorithm Flood_fill (x, y, fillcolor, bkcolor)
    start
      if (getpixel (x,y) == bkcolor) than
        Begin
      Flood-fill (x+1, y, fillcolor, bkcolor)
       Flood-fill (x, y+1, fillcolor, bkcolor)
       Flood-fill (x-1, y, fillcolor, bkcolor)
       Flood-fill (x, y-1, fillcolor, bkcolor)
       END

END
```

getpixel (x,y) : It returns the color of particular co-ordinate x,y.

Conclusion :-

We have learn & implement the polygon filling algorithm flood fill & its pixel approach & way of using in recursive manner.