Expt No. A4

classmate
Date :
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Assignment No. 4.

Title :- Polygon Drawing. ~~& filling~~

Problem Statement :-

Write the C++ program to draw the polygon by using the mouse. choose the colors by clicking on designed color pane.

Objective :-

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

Outcome :-

To implement the polygon drawing algorithm.

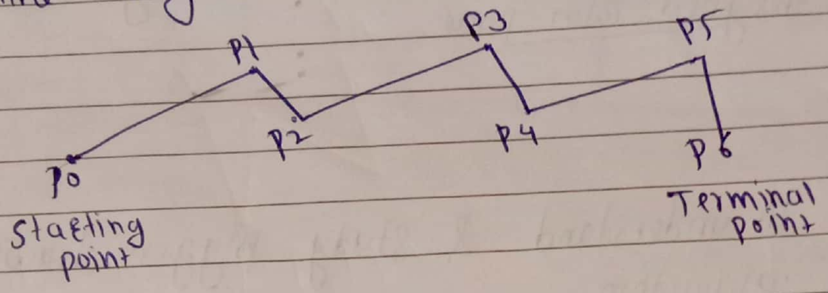
Software & hardware requirement :-

Linux based OS.
QT creator.

Theory :-

- **Polygons** :-

Polyline :- Polyline is chain of connected line segments.

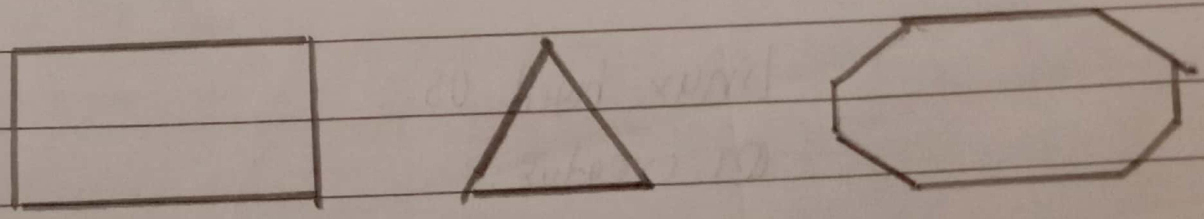


- when the starting point & terminal point of any polyline is same then it is called polygon.
- segments which make up polygon boundary are called sides of polygon.

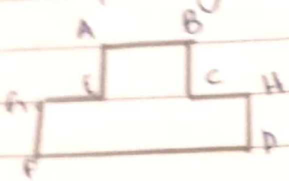
- **Types of polygons** :-

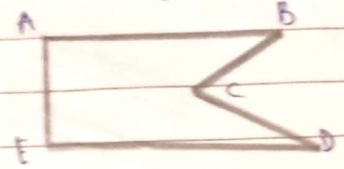
- Convex :-

A polygon in which line segment joining any two points within polygon lies completely inside the polygon.

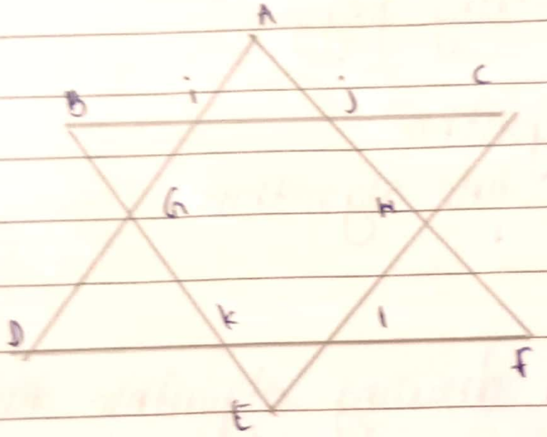


- Concave - A polygon in which line segment joining any two points within the polygon may not lie completely inside the polygon.





- Complex - Polygon in which edges intersect each other is called complex polygon.



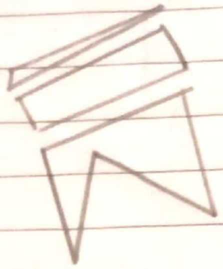
⊙ polygon represntation -

1) polygon as unit :-

Some graphics device supply a polygon drawing primitives to directly image polygon image.

ii) Trapezoid primitive :

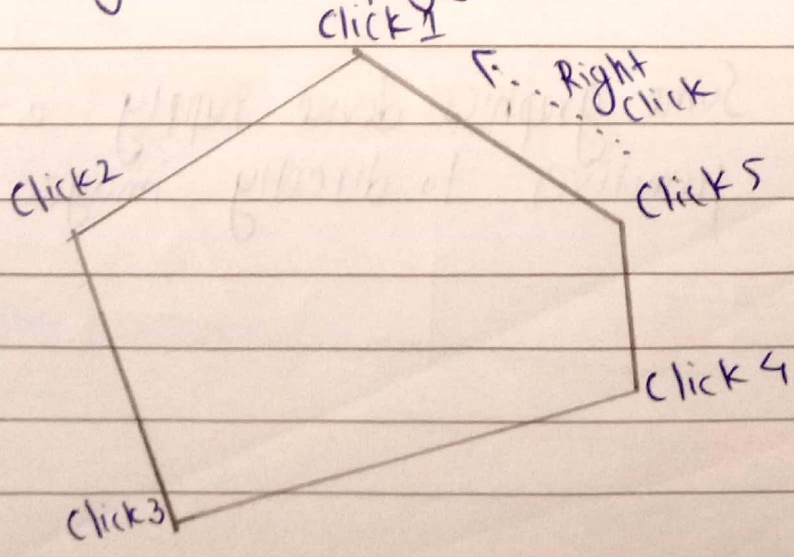
Represent polygon as series of trapezoid.



⊙ 2-ways of entering polygon

i) DDA line algorithm
ii) Brsenham's line algorithm

- Same line drawing algorithm can be used to draw polygon
- When we click on the mouse the repeated line are drawn using any of the algorithm.
- Due to right click polygon get closed.



Algorithm -

```
1. Declare array  a[10] . b[10]
2. mousepressEvent (QMouseEvent  *obj)
     {
        i, if (start == true) then
              p = pos(). x();
              q = pos(). y();
                a[ver] = p;
                b[ver] = q;

            end if

     ii. if (button = RightButton) then
           {
             DDA (a[ver], b[ver], a[0], b[0]);
              Start = false;
           }
    iii    vert+;

3. onpushButton_ clicked ()
     {
     color. getColor ();
     }
```

Conclusion :-

We have learn & implement the polygon drawing algorithm & MouseEvent handling in this assignment.