

Title: Polygon Drawing

Problem statement:

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

Learning objective:

- To understand and study polygon drawing.
- To understand and study different concepts and features of oop.
- To understand & study different manipulation facilities in Qtcreator IDE.

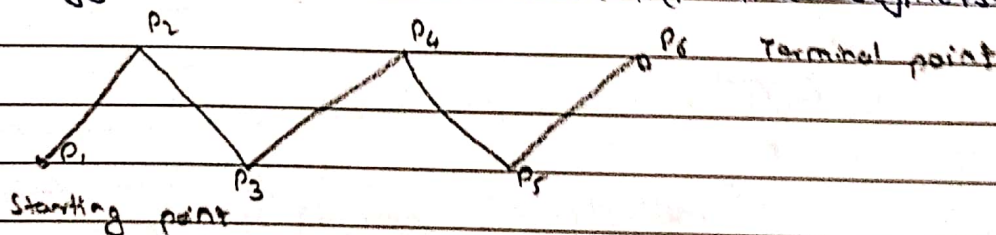
Learning outcome:

To implement the polygon drawing algorithm.

Concepts related theory:

Polygon:

- Polygon is a chain of connected line segments.



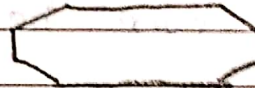
- When the starting point and terminal point of any polygon is gone then it is called polygon.
- Segments which make up polygon boundary are called sides of polygon.

* Types of polygon:

1) Convex:

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

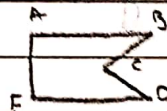
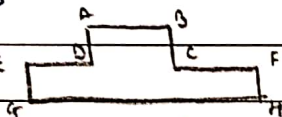
- eg.



2) Concave:

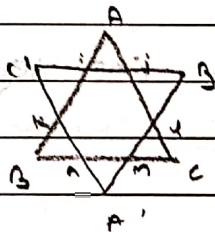
- A polygon in which line segment joining any two points within the polygon may not lie completely inside the polygon.

- eg.



3) Complex:

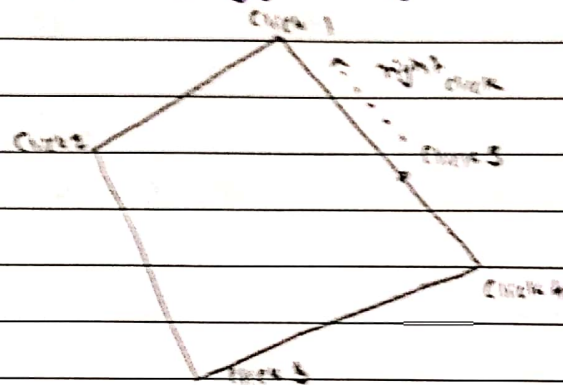
- Polygon in which edges intersect each other is called complex polygon.



* 2 ways of finding polygon:

1. DDA line algorithm
2. Bresenham's line algorithm.

- * If some line drawing algorithm can be used for drawing polygon.
- When we click on the mouse the repeated line are drawn using any of the algorithm.
 - Due to right polygon gets closed.



Algorithm:

- 1) Declare array $a[10]$, $b[10]$.
- 2) Mouse Press Event (MouseEvent obj)
 - i. if (start = true)
 - $p = pos(x).x()$
 - $q = pos().y()$
 - $a[ver] = p$
 - $b[ver] = q$
 - end if
 - ii. if (button = RightButton)
 - { DDA ($a[ver]$, $b[ver]$, $a[0]$, $b[0]$)
 - start = true;
 - iii. ver++;
- 3) OnPush - Button clicked ()
 - { color = getcolor ();

DATE:

Conclusion: We have learned and implemented the polygon drawing algorithm & Mouse Event handling in this assignment.

Algorithm:
1. Define array of points
2. Mouse Event (onClick)

if (x < 0 || x > 1000 || y < 0 || y > 1000)

return;

if (x == 0 || x == 1000 || y == 0 || y == 1000)

return;

if (x == 0 || x == 1000 || y == 0 || y == 1000)

return;

if (x == 0 || x == 1000 || y == 0 || y == 1000)

return;

return;

return;

return;

}

(mouseClick) return;