Kathmandu University

Dhulikhel, Kavre

Department of Computer Science and Engineering

Computer Graphics (COMP 342)

Lab 2 Report

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Implement Digital Difference Analyzer line drawing algorithm.

Algorithm:

Input: coordinates of two endpoints of a line. (x1,y1) and (x2,y2)

Output: a line with those two endpoints using Digital Difference analysing approach.

1. Calculate slope using two endpoints. slope = (y2-y1)/(x2-x1)
2. IF slope < 1
   2.1. WHILE x1 != x2
      2.1.1. Plot(x1,y1)
      2.1.2. x1 = x1 + 1
      2.1.3. y1 = y1 + slope

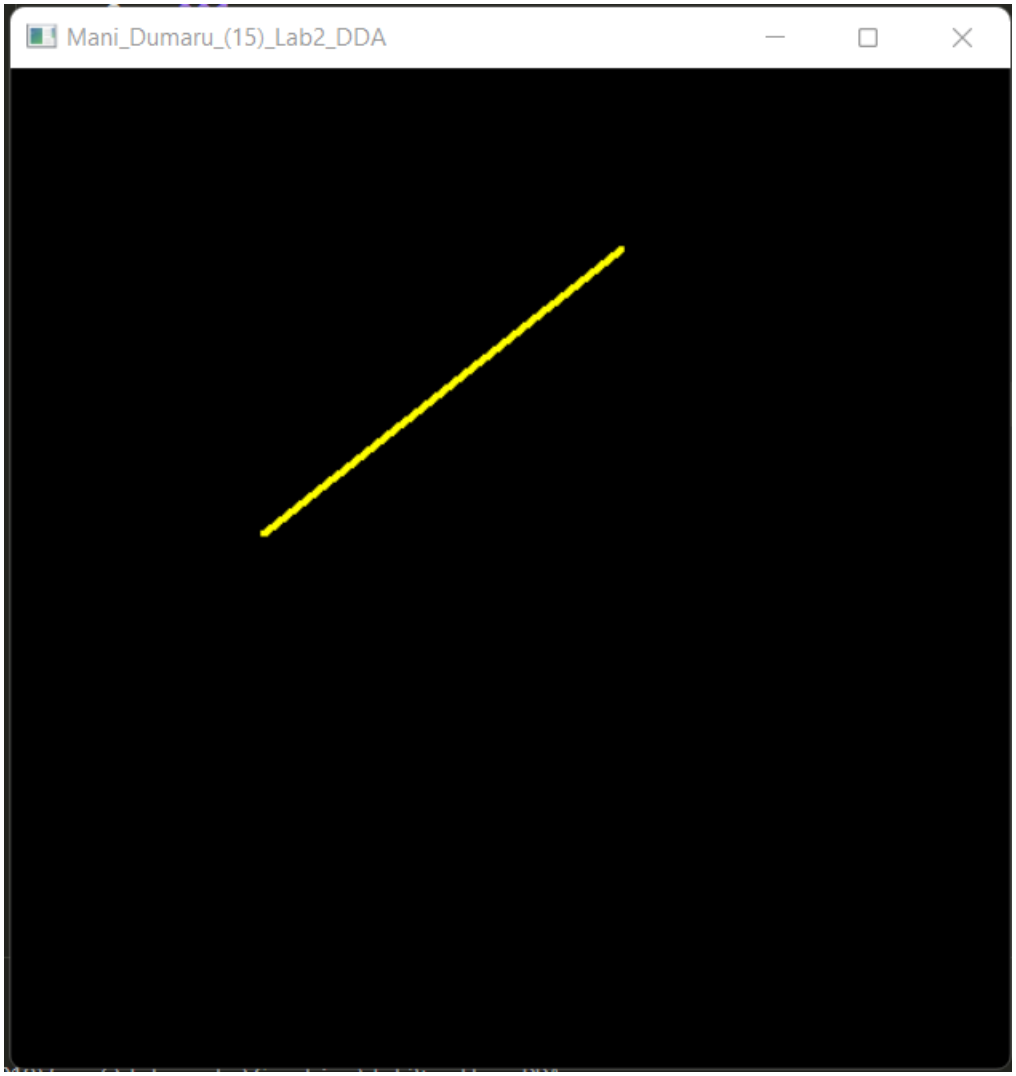
      END WHILE
3. Else
   3.1. WHILE y1 != y2
      3.1.1. PLOT(x1,y1)
      3.1.2. y1 = y1 + 1
      3.1.3. x1 = x1 + (1/slope)

      END WHILE

   END IF

Link to Source Code: dda.py

Output:



Implement Bresenham Line Drawing Algorithm for both slopes.

Algorithm:

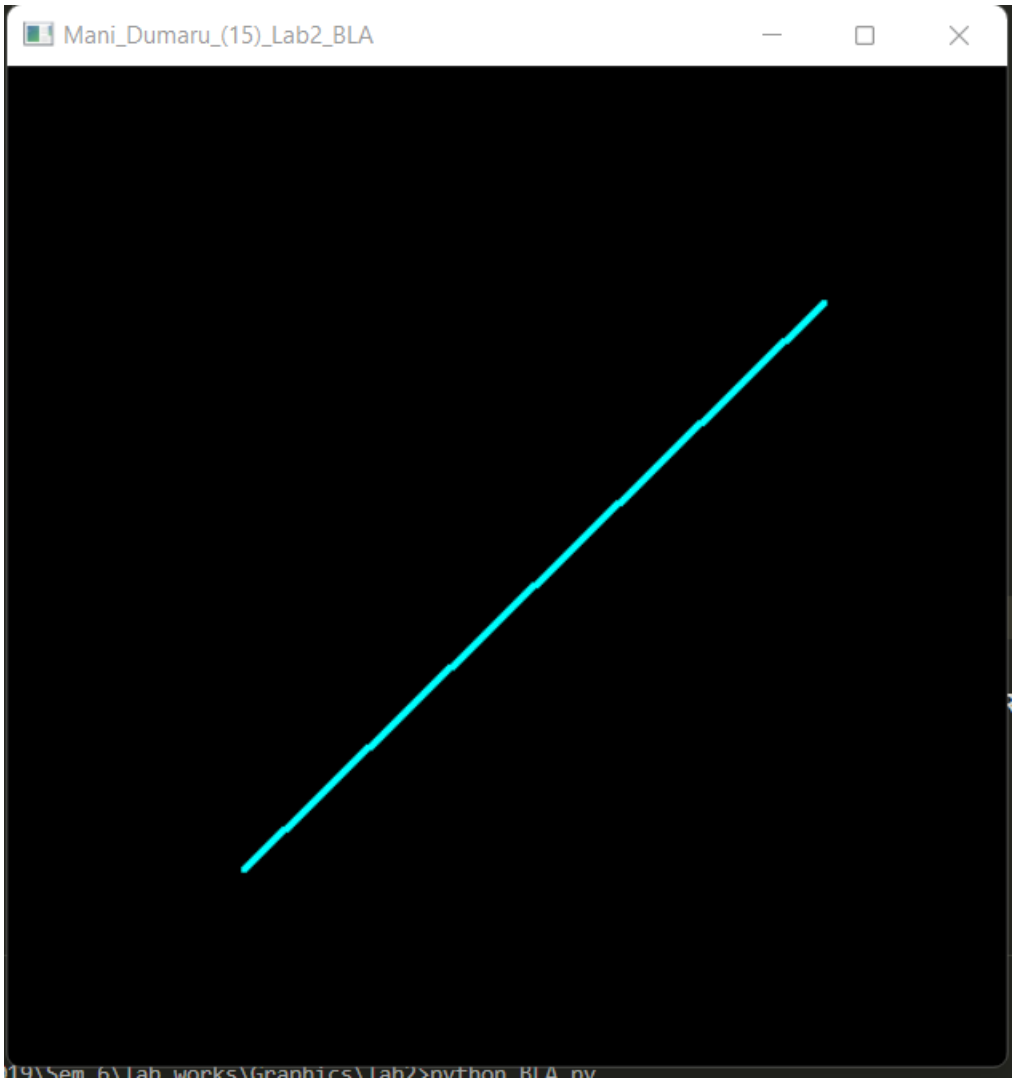
Input: coordinates of two endpoints of a line. (x1,y1) and (x2,y2)

Output: a line with those two endpoints in BLA approach.

1. Calculate slope of the line. slope = (y2-y1)/(x2-x1)
2. Calculate c = y1 – (slope * x1)
3. if slope < 1
   - 3.1. while x1 != x2
     - 3.1.1. PLOT(x1,y1)
     - 3.1.2. x = x + 1
     - 3.1.3. Calculate actual_y = (slope*x) + c
     - 3.1.4. d1 = (y1+1) - actual_y
     - 3.1.5. d2 = actual_y – y1
     - 3.1.6. if d1-d2 < 0
       - 3.1.6.1. y1 = y1 + 1
     - 3.1.7. END WHILE
4. ELSE
   - 4.1. while y1 != y2
     - 4.1.1.PLOT(x1,y1)
     - 4.1.2. y1 = y1 + 1
     - 4.1.3. Calculate actual_x = (y1 - c) / slope
     - 4.1.4. d1 = (x1+1) – actual_x
     - 4.1.5. d2 = actual_x – x1
     - 4.1.6.If d1-d2 < 0
       - 4.1.6.1. x1 = x1 + 1
     - 4.1.7.END WHILE
5. END IF

Link to Source Code: [bla.py]

Output:



Conclusion:

Hence, a line was shaped using two endpoints by calculating its slope using digital difference analyzer algorithm and bresenham line drawing algorithm.