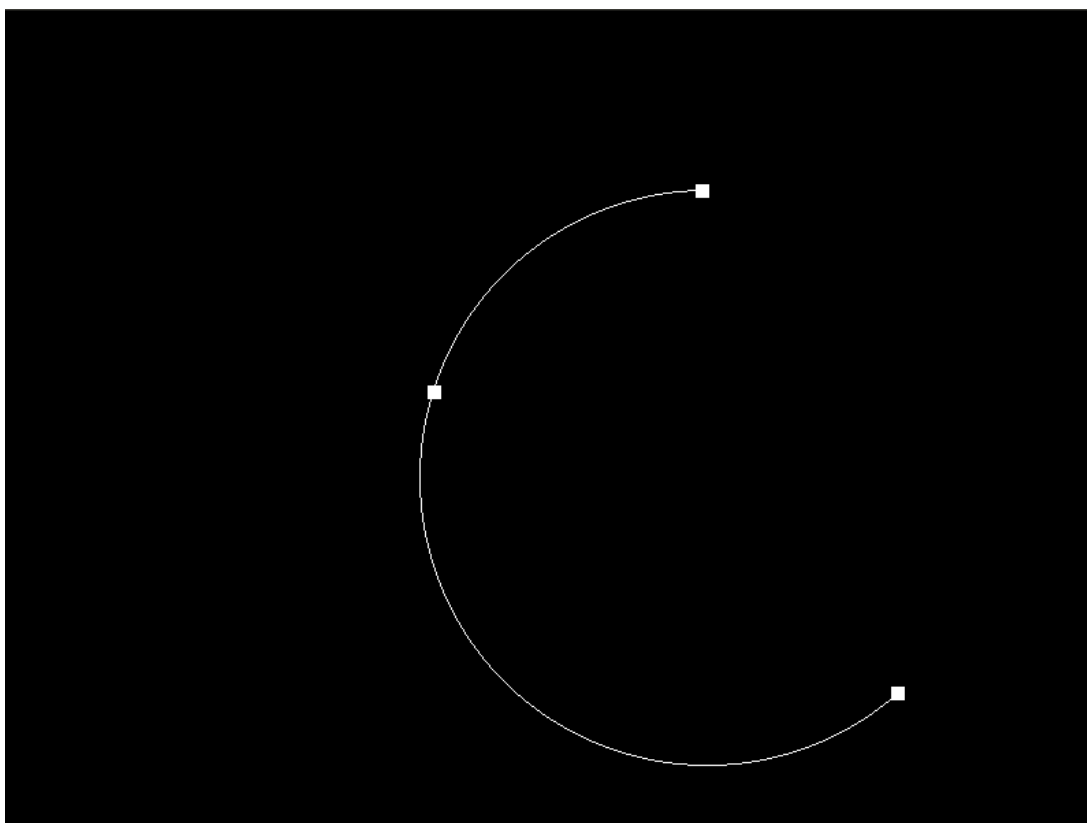
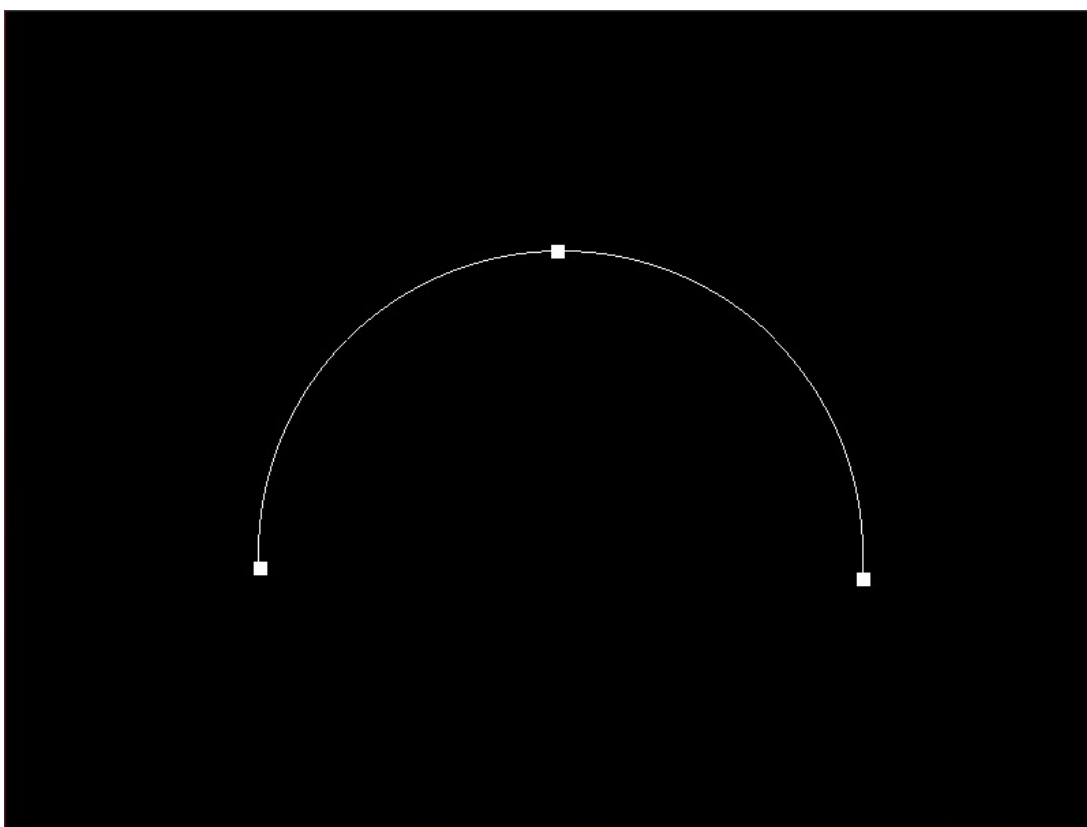


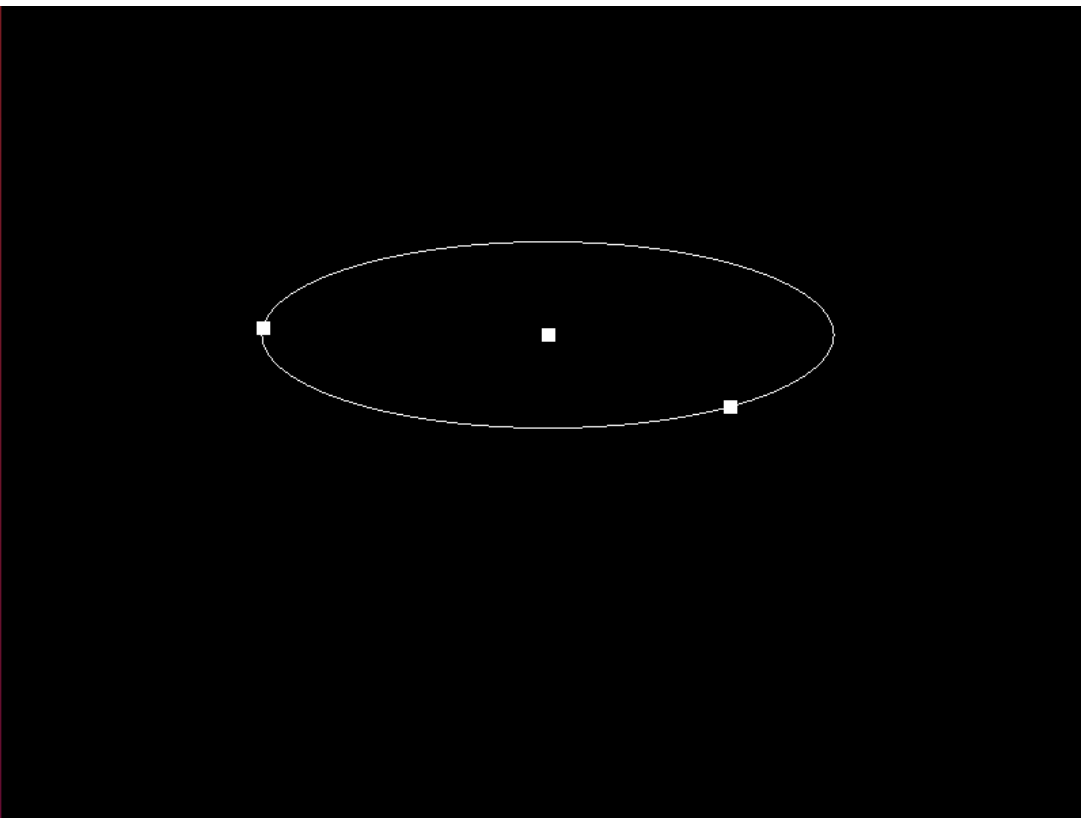
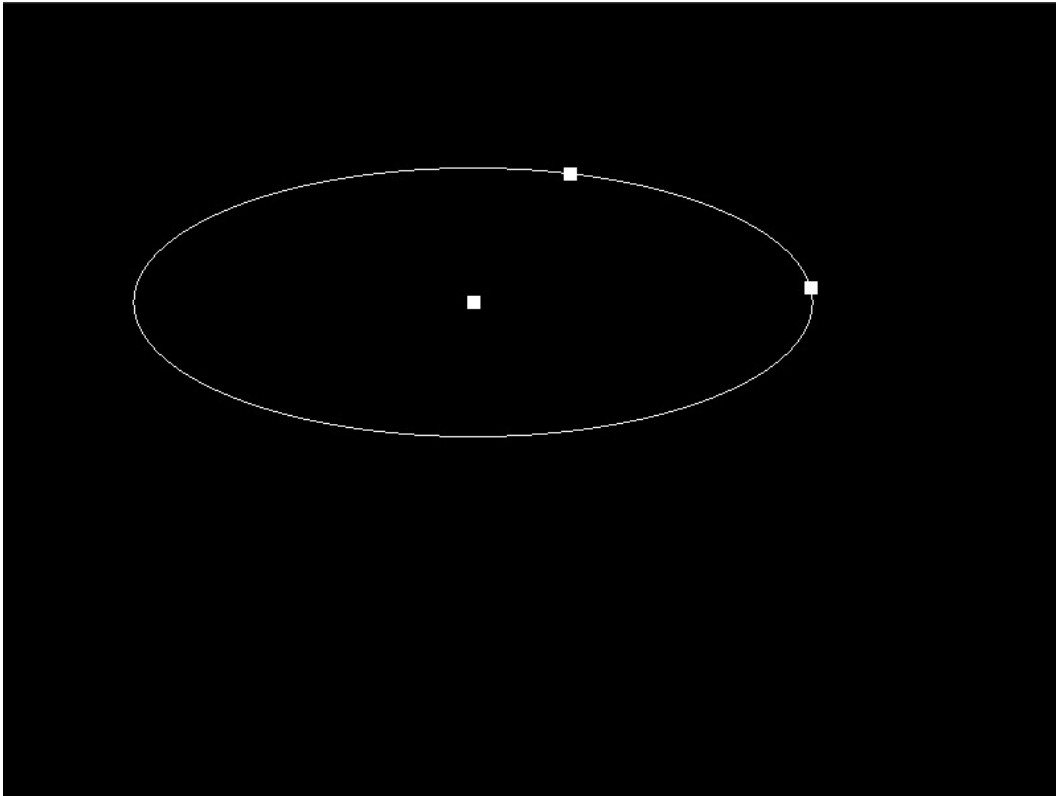
Assignment 2

A) Implement Algorithm For Drawing Circular Arc Passing Through 3 Points



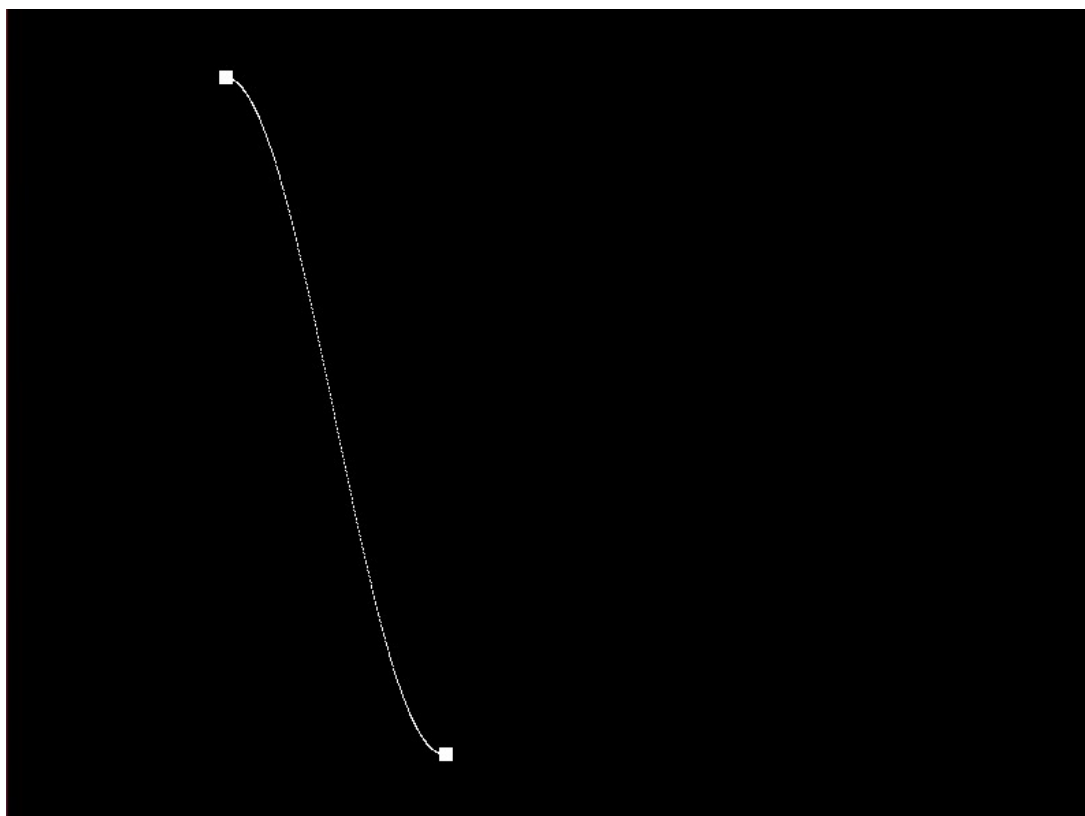
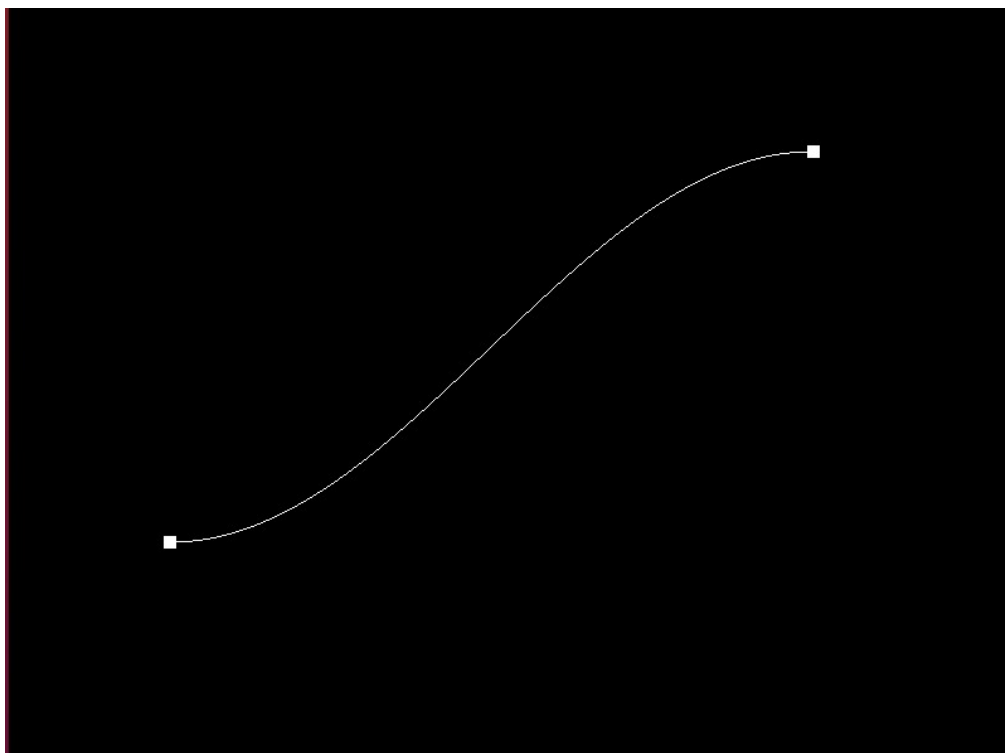
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B) Implement Midpoint Algorithm to Draw an Ellipse



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C) Develop and Implement Algorithm to Plot Half Cycle of a Sine Wave



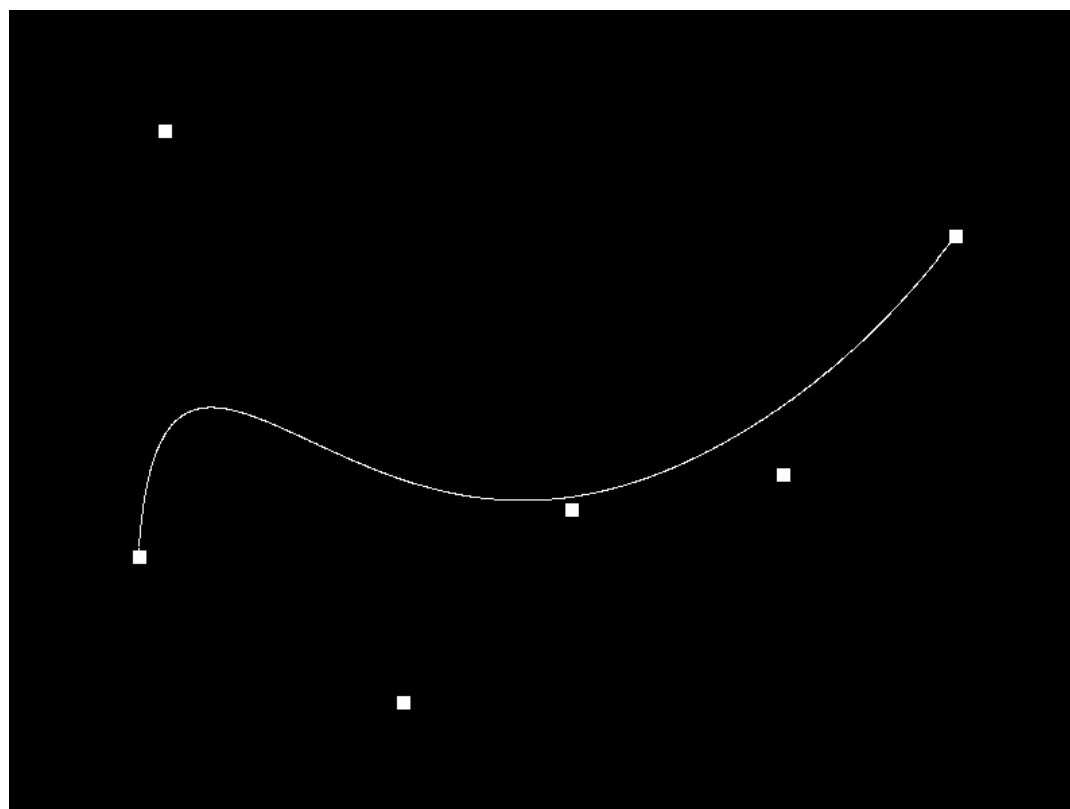
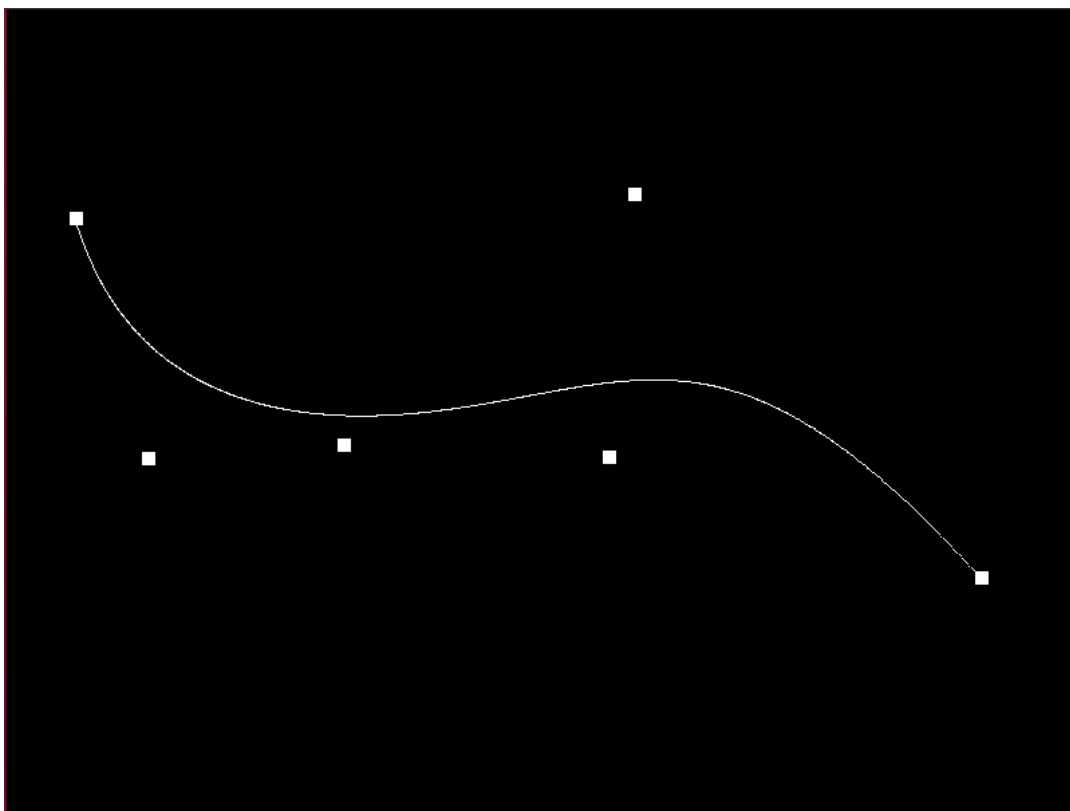
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Algorithm/Sudocode

- 1) Create point **p1** from the values (**ptX1**, **ptY1**) and point **p2** from the values (**ptX2**, **ptY2**)
- 2) If **p1.x** is greater than **p2.x** then swap **p1** and **p2**
- 3) Create point **mid** which is the mid point between **p1** and **p2**
- 4) Create vector **v** which is made from **p2 - p1**
- 5) Create initial time step (**Ti**) which is equal to $1/2\pi$ if **p1.y** is greater than **p2.y** or $-1/2\pi$ if it is not
- 6) Create the final time step (**Tn**) which is equal to $Ti + \pi$
- 7) Create delta time (**dy**) which is equal to $\frac{\pi}{\max(|v.x|, |v.y|)}$
- 8) Create y multiplier (**yMult**) which is equal to $\left| \frac{p1.y - p2.y}{2} \right|$
- 9) Create time (**t**) and set it equal to **Ti**
- 10) Calculate x position (**currentX**) which is equal to $\frac{(t - Ti)(p2.x - p1.x)}{Tn - Ti} + p1.x$
- 11) Create value **tFixed** which takes the value of **t** and clamps it between $-\pi$ and π
- 12) Calculate the value **y** which is equal to $\sum_{n=1}^{\infty} \frac{-1^{n-1} tFixed^{2n-1}}{(2n-1)!}$. When calculating y stop the summation once the difference in magnitude is ≤ 0.01 .
- 13) Create y position (**currentY**) which is equal to **mid.y** + **y** + **yMult**
- 14) plot the point (**currentX**, **currentY**)
- 15) set **t** equal to **t + dy**
- 16) Repeat steps 10-15 until **t** > **Tn**

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D) Draw a Quintic Bezier Curve



E) Implement Algorithm for Drawing B-Splines in Order 3

