Experiment – 1

Aim: To learn Digital Differential Analyser (DDA) Line Drawing Algorithm

Theory

- DDA is an incremental scan conversion method to determine points on screen to draw a line where the Start and End coordinates of the Line segment are provided.
- DDA calculates the length of the line segment with respect to the difference between either X coordinates or Y coordinates, whichever is greater.
- In DDA, we either step across X-Direction and solve for Y (In case of gentle slope lines) or we step Y-Direction and solve for X (incase of sharp slope lines) with the help of increment in either X and/or Y directions.
- As the increments are calculated with respect to X or Y direction ,so one of the increment will be either (1,/0/-1) and the other increment may be in float.
- Floating point arithmetic in DDA algorithm is time-consuming which results in poor end point accuracy.
- It is the simplest algorithm and does not require special skills for implementation.

Procedure

ALGORITHM :

1. Start.
2. Accept End points of the line which are (x1, y1) and (x2, y2).
3. Calculate the Length of the Line segment:

```
 if ( abs(x2-x1) >= abs(y2-y1) )

 then

 length = abs(x2-x1).

else
```

```
length = abs (y2-y1).
```

4. Calculate the increment in X and Y directions respectively as:

```
xincr = (x2-x1) / length.
yincr = (y2-y1) / length.
```

5. Initialize:

```
x=x1+0.5.
y=y1+0.5.
i=1.
```

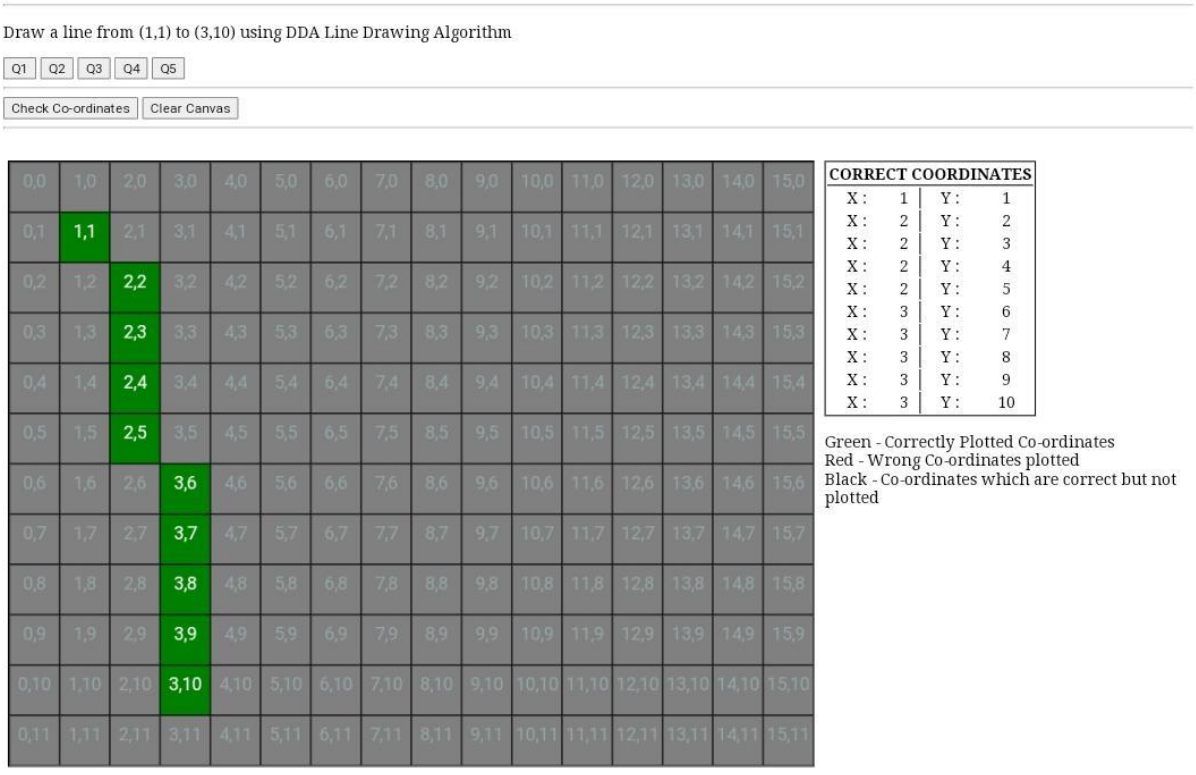
6. while (i <= length)

```
{
  plot (integer(x), integer(y))

  x = x + xincr.
  y = y + yincr.
  i   = i + 1.
}
```

7. Stop.

Stimulation:



Conclusion: Hence, we learnt that how to draw DDA line drawing algorithm.