

TDM	729.89	915.51	185.62	▲25.43%	FLR	660.27	745.28	85.01	▲12.88%
HUM	749.73	924.29	174.56	▲23.28%	UVD	155.59	181.57	25.98	▲16.70%
DMW	833.72	1004.01	170.29	▲20.43%	QUV	440.55	540.21	99.66	▲22.62%
YZJ	903.49	1127.46	223.97	▲24.79%	HZT	285.51	344.98	59.47	▲20.83%
GLY	982.07	1219.39	237.32	▲24.17%	PCW	811.44	1029.66	218.22	▲26.89%
VDA	113.74	143.41	29.67	▲26.09%	AIK	361.77	451.39	89.62	▲24.77%
UVV	468.08	535.41	67.33	▲14.38%	ZJJ	858.36	994.57	136.21	▲15.87%
HJS	545.49	659.05	113.56	▲20.82%	RHJ	894.79	1046.68	151.89	▲16.97%
EQC	566.96	664.69	97.73	▲17.24%	VQV	425.08	509.95	84.87	▲19.97%

PPJ	912.63	1038.36	125.73	▲13.78%	ZBK	391.59	491.48	99.89	▲25.51%
UAQ	1309.55	1655.62	346.07	▲26.43%	BNY	969.21	1130.65	161.44	▲16.66%
DAQ	1295.17	1641.66	346.49	▲26.75%	SDM	735.44	913.39	177.95	▲24.20%
PNR	654.33	775.84	121.51	▲18.57%	TQO	1323.91	1646.42	322.51	▲24.36%
ZTM	101.10	121.10	20.00	▲19.77%	OIS	543.42	667.24	123.82	▲22.75%
YIM	1005.17	1223.50	218.33	▲21.69%					

Computer Graphics and Animations

L-5






SYIT

Rohini D, Madhavi A



Bresenham's Line Drawing Algorithm

- The Bresenham's algorithm uses only integer addition, subtraction and multiplication by 2
- And we know that computer can perform integer addition and subtraction very rapidly.
- The computer is also time efficient when performing integer multiplication by 2.
- The basic principle of Bresenham's algorithm is to select the optimum raster locations to represent a straight line.

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- To accomplish this the algorithm always increments either x or y by one unit depending upon the slope of the line.
 - The increment in other variable is determined by examining the distance between the actual line location and the nearest pixel.
 - This distance is called decision variable or error.
 - The error term is initially set as $e = 2 * \Delta y - \Delta x$.
 - Let us study the algorithm now:



Algorithm

Read the coordinates of the two end points (x_1, y_1) & (x_2, y_2) such that they are not equal. (if equal then plot that point and exit)

$\Delta x = |x_2 - x_1|$ and $\Delta y = |y_2 - y_1|$.

Initialize the starting point i.e $x = x_1$ and $y = y_1$.

Calculate $e = 2\Delta y - \Delta x$

Initialize $i = 1$.

Plot(x, y)

Algorithm

While($e \geq 0$)

{

$y = y + 1$

$e = e - 2 * \Delta x$

}

$x = x + 1$

$e = e + 2 * \Delta y$

$i = i + 1$

if($i \leq \Delta x$) then go to step 6.

Stop.

Examples

1

Consider the line from (5,5) to (13,9).
Use Bresenham's algorithm to rasterize the line.

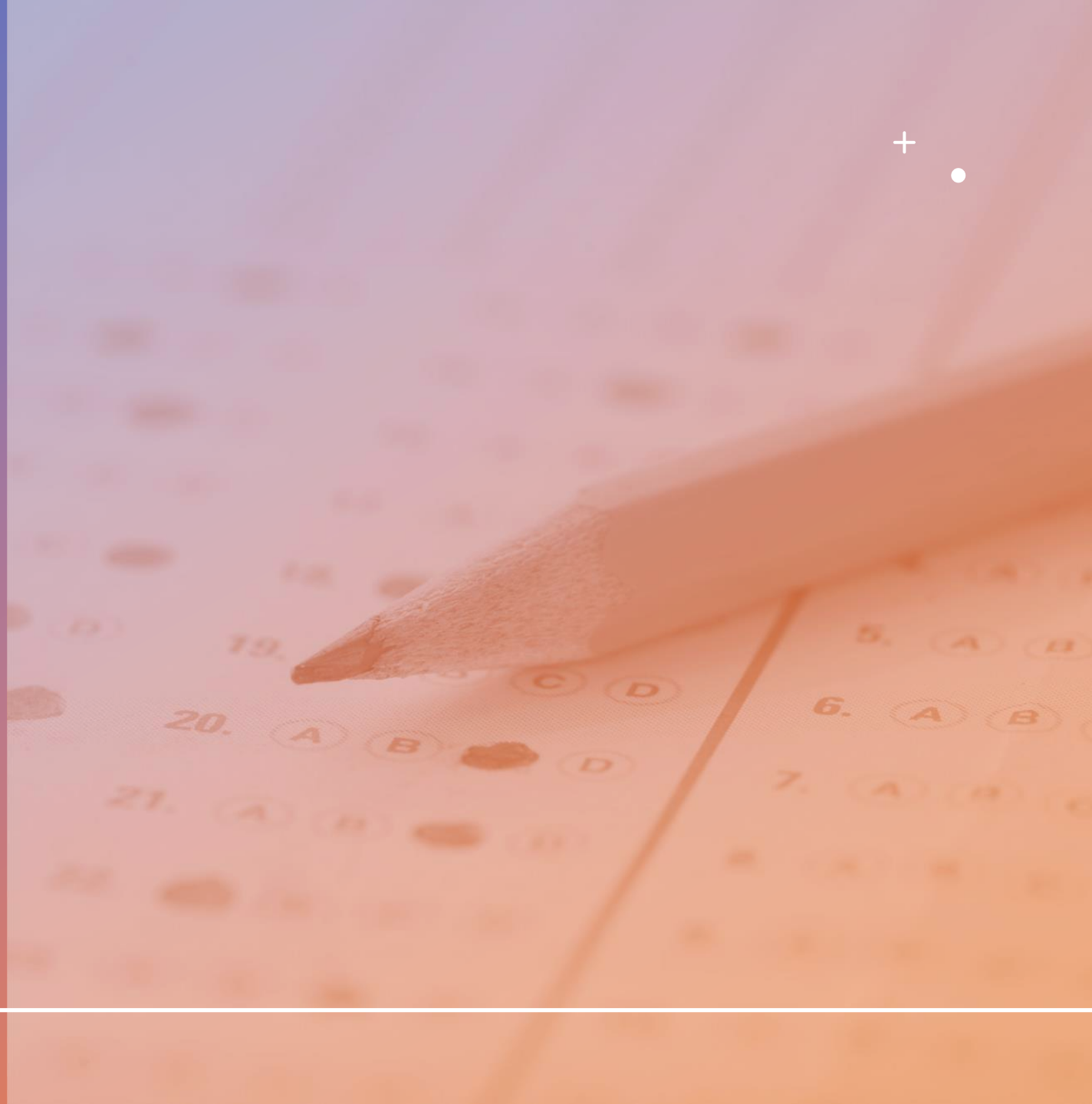
2

Calculate the points between the starting coordinates (9, 18) and ending coordinates (14, 22).

3

Calculate the points between the starting coordinates (20, 10) and ending coordinates (30, 18).

Quiz



Thank You

