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Enrollment No-IIT2018031 **Assignment** **4th August 2020**

Ques- Write pseudo Code to join 2 points (x1,y1) & (x2,y2) with a straight line.

Answer-

If slope(m) <= 1:

Pseudocode:

```
dx= x1-x0 , dy= y1-y0 , x= x0, y= y0
p=
2*dy-dx
while(x<x1)
    if(p>=0
    )
        putpixel(x,y
        )
        y+
        +
        p+= 2*dy-2*dx
    else
    putpixel(x,y)
        p+= 2*dy
```

x++

If
slope(m)>1:

Then 1/m < 1

This means in the above procedure of m<=1 instead for traversing through x we will traverse

through
y.

Pseudocode:

dx= x1-x0 , dy= y1-y0 , x= x0, y= y0

p=
2*dx-dy

while(y<y1)

if(p>=0
)
putpixel(x,y
)

x+
+

p+= 2*dx-2*dy

else

putpixel(x,y)

p+= 2*dx

y++

Checking the given algorithm with these numerical examples

i) x1 = 5.3, y1= 3.7, x2 = 15.7, y2= 10.3

x1 = 5 y1 = 4 x2 = 16 y2 = 10 dx = x2 - x1 = 16 - 5 = 11 dy = y2 - y1 = 10 - 6 = 4
I1 = 2 * dy = 8 I2 = 2
(dy-dx) = 2 * (6-11) = -10 D = i1 - dx = 12 - 11 = 1

x	y	D= d+i1 or D= d+i2
5	4	1
6	5	-9
7	5	3
8	-6	7
9	6	5
10	7	-5
11	7	7
12	8	-3
13	8	9

14	9	-1
15	9	11
16	10	1

ii) x1 = 5.3, y1= 3.7, x2 = 15.7, y2=
15.1

x1 = 5 y1 = 4 x2 = 16 y2 =
15 dx = x2 - x1 = 16 - 5 =
11 dy = y2 - y1 = 15 - 4 =
11 I1 = 2 * dy = 22 I2 = 2
(dy-dx) = 2 * (11-11) = 0 D
= i1 - dx = 22 - 11 = 11

x	y	d = d+I1 or d+I2
5	4	11
6	5	11
7	6	11
8	7	11
9	8	11

10	9	11
11	10	11
12	11	11
13	12	11
14	13	11
15	14	11
16	15	11

iii) x1 = 5.3, y1= 3.7, x2 = 15.7, y2=
25.3;

x1 = 5 y1 = 4 x2 = 16 y2 =
25 dx = x2 - x1 = 16 - 5 = 11
dy = y2 - y1 = 25 - 4 = 21 I1
= 2 * dy = 22 I2 = 2 (dy-dx) =
2 * (11-21) = -20 D = i1 - dx
= 22 - 21 = 1

x	y	d = d+I1 or d = d+I2
5	4	1
6	5	-19

6	6	3
7	7	-17
7	8	5
8	9	-15
8	10	7
9	11	-13
9	12	9
10	13	-11
10	14	11
11	15	-9
11	16	13
12	17	-7
12	18	15
13	19	-5
13	20	17
14	21	-3
14	22	19
15	23	-1
15	24	21
16	25	1

iv) x1 = 5.3, y1= 3.7, x2 = 15.7, y2=
100.3;

x1 = 5 y1 = 4 x2 = 16 y2 =
100 dx = x2 - x1 = 16 - 5 = 11
dy = y2 - y1 = 100 - 4 = 96 I1
= 2 * dy = 22 I2 = 2 (dy-dx) =
2 * (11-96) = -170 D = i1 - dx
= 22 - 96 = -74

x	y	d = d+I1 or d= d+I2
5	4	-74
5	5	-52
5	6	-30
5	7	-8
5	8	14
6	9	-156
6	10	-134
6	11	-112
6	12	-90
6	13	-68
6	14	-46
6	15	-24
6	16	-2

6	17	20
7	18	-150
7	19	-128
7	20	-106
7	21	-84
7	22	-62
7	23	-40
7	24	-18
7	25	4
8	26	-166
8	27	-144
8	28	-122
8	29	-100
8	30	-78
8	31	-56
8	32	-34
8	33	-12
8	34	10
9	35	-160
9	36	-138

9	37	-116
9	38	-94
9	39	-72
9	40	-50
9	41	-28
9	42	-6
9	43	16
10	44	-154
10	45	-132
10	46	-110
10	47	-88
10	48	-66
10	49	-44
10	50	-22
10	51	0
11	52	-170
11	53	-148
11	54	-126
11	55	-104
11	56	-82

11	57	-60
11	58	-38
11	59	-16
11	60	6
12	61	-164
12	62	-142
12	63	-120
12	64	-98
12	65	-76
12	66	54
12	67	-32
12	68	-10
12	69	12
13	70	-158
13	71	-136
13	72	-114
13	73	-92
13	74	-70
13	75	-48
13	76	-26

13	77	-4
13	78	18
14	79	-152
14	80	-130
14	81	-108
14	82	-86
14	83	-64
14	84	-42
14	85	-20
14	86	2
15	87	-168
15	88	-146
15	89	-124
15	90	-102
15	91	-80
15	92	-58
15	93	-36
15	94	-14
15	95	8
16	96	-162
16	97	-140
16	98	-118

16	99	-96
16	100	-74

--- The End ---