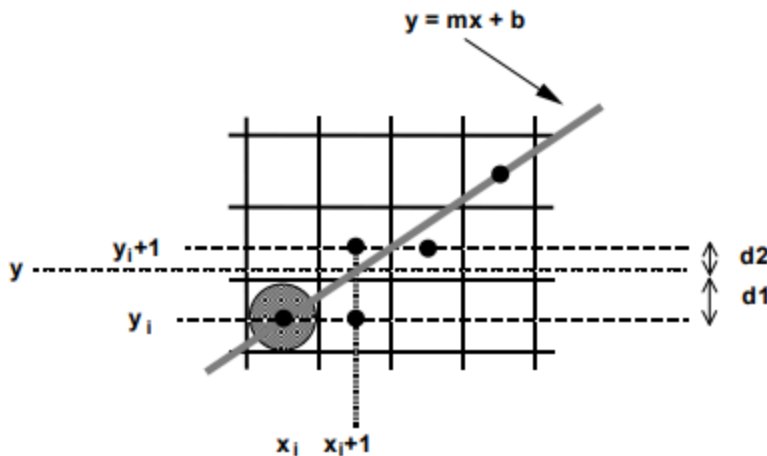


DERIVATION OF THE BRESENHAM'S LINE ALGORITHM

Assumptions:

- input: line endpoints at $(X1, Y1)$ and $(X2, Y2)$
- $X1 < X2$
- line slope $\leq 45^\circ$, i.e. $0 < m \leq 1$
- x coordinate is incremented in steps of 1, y coordinate is computed
- generic line equation: $y = mx + b$



Derivation

Assume that we already have a location of pixel (x_i, y_i) and have plotted it. The question is, what is the location of the next pixel.

Geometric location of the line at x-coordinate $x_{i+1} = x_i + 1$ is:

$$y = m(x_i + 1) + b \quad (1)$$

where:

$$m = \Delta y / \Delta x \text{ (slope)} \quad (2)$$

b – intercept

$$\Delta x = X2 - X1 \text{ (from the assumption above that } X1 < X2 \text{)} \quad (3)$$

$$\Delta y = Y2 - Y1$$

Define:

$$d1 = y - y_i = m(x_i + 1) + b - y_i$$

$$d2 = (y_i + 1) - y = y_i + 1 - m(x_i + 1) - b$$

Calculate:

$$\begin{aligned} d1 - d2 &= m(x_i + 1) + b - y_i - y_i - 1 + m(x_i + 1) + b \\ &= 2m(x_i + 1) - 2y_i + 2b - 1 \end{aligned} \quad (4)$$

$$\text{if } d1 - d2 < 0 \text{ then } y_{i+1} \leftarrow y_i \quad (5)$$

$$\text{if } d1 - d2 > 0 \text{ then } y_{i+1} \leftarrow y_i + 1 \quad (6)$$

We want integer calculations in the loop, but m is not an integer. Looking at definition of m ($m = \Delta y / \Delta x$) we see that if we multiply m by Δx , we shall remove the denominator and hence the floating point number.

For this purpose, let us multiply the difference ($d1 - d2$) by Δx and call it p_i :

$$p_i = \Delta x (d1 - d2)$$

The sign of p_i is the same as the sign of $d1 - d2$, because of the assumption (3).

Expand p_i :

$$\begin{aligned} p_i &= \Delta x (d1 - d2) \\ &= \Delta x [2m(x_i + 1) - 2y_i + 2b - 1] && \text{from (4)} \\ &= \Delta x [2 \cdot (\Delta y / \Delta x) \cdot (x_i + 1) - 2y_i + 2b - 1] && \text{from (2)} \\ &= 2 \cdot \Delta y \cdot (x_i + 1) - 2 \cdot \Delta x \cdot y_i + 2 \cdot \Delta x \cdot b - \Delta x && \text{result of multiplication by } \Delta x \\ &= 2 \cdot \Delta y \cdot x_i + 2 \cdot \Delta y - 2 \cdot \Delta x \cdot y_i + 2 \cdot \Delta x \cdot b - \Delta x \\ &= 2 \cdot \Delta y \cdot x_i - 2 \cdot \Delta x \cdot y_i + \underline{2 \cdot \Delta y + 2 \cdot \Delta x \cdot b - \Delta x} \end{aligned} \quad (7)$$

Note that the underlined part is constant (it does not change during iteration), we call it c , i.e.

$$c = 2 \cdot \Delta y + 2 \cdot \Delta x \cdot b - \Delta x$$

Hence we can write an expression for p_i as:

$$p_i = 2 \cdot \Delta y \cdot x_i - 2 \cdot \Delta x \cdot y_i + c \quad (8)$$

Because the sign of p_i is the same as the sign of $d1 - d2$, we could use it inside the loop to decide whether to select pixel at $(x_i + 1, y_i)$ or at $(x_i + 1, y_i + 1)$. Note that the loop will only include integer arithmetic. There are now 6 multiplications, two additions and one selection in each turn of the loop.

However, we can do better than this, by defining p_i recursively.

$$\begin{aligned} p_{i+1} &= 2 \cdot \Delta y \cdot x_{i+1} - 2 \cdot \Delta x \cdot y_{i+1} + c && \text{from (8)} \\ p_{i+1} - p_i &= 2 \cdot \Delta y \cdot x_{i+1} - 2 \cdot \Delta x \cdot y_{i+1} + c \\ &\quad - (2 \cdot \Delta y \cdot x_i - 2 \cdot \Delta x \cdot y_i + c) \\ &= 2 \Delta y \cdot (x_{i+1} - x_i) - 2 \Delta x \cdot (y_{i+1} - y_i) && x_{i+1} - x_i = 1 \text{ always} \end{aligned}$$

$$p_{i+1} - p_i = 2 \Delta y - 2 \Delta x \cdot (y_{i+1} - y_i)$$

Recursive definition for p_i :

$$p_{i+1} = p_i + 2 \Delta y - 2 \Delta x \cdot (y_{i+1} - y_i)$$

If you now recall the way we construct the line pixel by pixel, you will realise that the underlined expression: $y_{i+1} - y_i$ can be either 0 (when the next pixel is plotted at the same y-coordinate, i.e. $d1 - d2 < 0$ from (5)); or 1 (when the next pixel is plotted at the next y-coordinate, i.e. $d1 - d2 > 0$ from (6)). Therefore the final recursive definition for p_i will be based on choice, as follows (remember that the sign of p_i is the same as the sign of $d1 - d2$):

$$\begin{aligned} \text{if } p_i < 0, \quad p_{i+1} &= p_i + 2 \Delta y && \text{because } 2 \Delta x \cdot (y_{i+1} - y_i) = 0 \\ \text{if } p_i > 0, \quad p_{i+1} &= p_i + 2 \Delta y - 2 \Delta x && \text{because } (y_{i+1} - y_i) = 1 \end{aligned}$$

At this stage the basic algorithm is defined. We only need to calculate the initial value for parameter p_0 .

$$p_i = 2 \cdot \Delta y \cdot x_i - 2 \cdot \Delta x \cdot y_i + 2 \cdot \Delta y + 2 \cdot \Delta x \cdot b - \Delta x \quad \text{from (7)}$$

$$p_0 = 2 \cdot \Delta y \cdot x_0 - 2 \cdot \Delta x \cdot y_0 + 2 \cdot \Delta y + 2 \cdot \Delta x \cdot b - \Delta x \quad (9)$$

For the initial point on the line:

$$y_0 = mx_0 + b$$

therefore

$$b = y_0 - (\Delta y / \Delta x) \cdot x_0$$

Substituting the above for b in (9)we get:

$$\begin{aligned} p_0 &= 2 \cdot \Delta y \cdot x_0 - 2 \cdot \Delta x \cdot y_0 + 2 \cdot \Delta y + 2 \Delta x \cdot [y_0 - (\Delta y / \Delta x) \cdot x_0] - \Delta x \\ &= 2 \cdot \Delta y \cdot x_0 - 2 \cdot \Delta x \cdot y_0 + 2 \cdot \Delta y + 2 \Delta x \cdot y_0 - 2 \Delta x \cdot (\Delta y / \Delta x) \cdot x_0 - \Delta x && \text{simplify} \\ &= 2 \cdot \Delta y \cdot x_0 - 2 \cdot \Delta x \cdot y_0 + 2 \cdot \Delta y + 2 \Delta x \cdot y_0 - 2 \Delta y \cdot x_0 - \Delta x && \text{regroup} \\ &= 2 \cdot \Delta y \cdot x_0 - 2 \Delta y \cdot x_0 - 2 \cdot \Delta x \cdot y_0 + 2 \Delta x \cdot y_0 + 2 \cdot \Delta y - \Delta x && \text{simplify} \\ &= 2 \cdot \Delta y - \Delta x \end{aligned}$$

We can now write an outline of the complete algorithm.

Algorithm

1. Input line endpoints, (X1,Y1) and (X2, Y2)
 2. Calculate constants:
 $\Delta x = X2 - X1$
 $\Delta y = Y2 - Y1$
 $2\Delta y$
 $2\Delta y - \Delta x$
 3. Assign value to the starting parameters:
 $k = 0$
 $p_0 = 2\Delta y - \Delta x$
 4. Plot the pixel at ((X1,Y1)
 5. For each integer x-coordinate, x_k , along the line
 if $p_k < 0$ plot pixel at ($x_k + 1, y_k$)
 $p_{k+1} = p_k + 2\Delta y$ (note that $2\Delta y$ is a pre-computed constant)

 else plot pixel at ($x_k + 1, y_k + 1$)
 $p_{k+1} = p_k + 2\Delta y - 2\Delta x$
 (note that $2\Delta y - 2\Delta x$ is a pre-computed constant)

 increment k
- while $x_k < X2$

```
#include<GL/glut.h>
#include<stdio.h>
#include<stdlib.h>
int x1, y1, x2, y2;
void myInit()
{
glClearColor(0.0, 0.0, 0.0, 1.0);
glClear(GL_COLOR_BUFFER_BIT);
glMatrixMode(GL_PROJECTION);
```

```

gluOrtho2D(0, 900, 0, 900);
}
void draw_pixel(int x, int y)
{
glEnable(GL_POINT_SMOOTH);
glPointSize(2.0f);
glBegin(GL_POINTS);
glVertex2i(x, y);
glColor3f(0.0,0.0,1.0);
glEnd();
}
void draw_line(int x1, int x2, int y1, int y2)
{
int dx, dy, i, e;
int incx, incy, inc1, inc2;
int x,y;
dx = x2-x1;
dy = y2-y1;
if (dx < 0) dx = -dx;
if (dy < 0) dy = -dy;

incx = 1;
if (x2 < x1) incx = -1;
incy = 1;
if (y2 < y1) incy = -1;

x = x1;
y = y1;

```

```

if (dx > dy) //FIRST PART
{
draw_pixel(x, y);
e = 2 * dy - dx;
inc1 = 2*(dy-dx);
inc2 = 2*dy;
for (i=0; i<dx; i++)
{
if (e >= 0)

```

```

{
y += incy;
e += inc1;
}
else
e += inc2;
x += incx;
printf("\n first part \n incx=%d incy=%d inc1=%d inc2=%d e=%d x=%d
y=%d\n",incx,incy,inc1,inc2,e,x,y);
draw_pixel(x, y);
}
}
else
{

```

//SECOND PART

```

printf("%d %d",x,y);
draw_pixel(x, y);
e = 2*dx-dy;
inc1 = 2*(dx-dy);
inc2 = 2*dx;
for (i=0; i<dy; i++)
{
if (e >= 0)
{
x += incx;
e += inc1;
}
else
e+= inc2;
y += incy;
printf("\n in second part");
printf("incx=%d incy=%d inc1=%d inc2=%d e=%d x=%d
y=%d\n",incx,incy,inc1,inc2,e,x,y);
draw_pixel(x, y);
}
}
}
void myDisplay()
{

```

```

draw_line(x1, x2, y1, y2);
glFlush();
}
int main(int argc, char **argv)
{
printf( "Enter (x1, y1, x2, y2)\n");
scanf("%d %d %d %d", &x1, &y1, &x2, &y2);
glutInit(&argc, argv);
glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
glutInitWindowSize(500, 500);
glutInitWindowPosition(0, 0);
glutCreateWindow("Bresenham's Line Drawing");
myInit();
glutDisplayFunc(myDisplay);
glutMainLoop();
return 0;
}

```

TRACE

Enter (x1, y1, x2, y2)
10 50 20 80

10 50

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=10 y=51

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=11 y=52

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=11 y=53

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=11 y=54

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=12 y=55

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=12 y=56

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=12 y=57

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=13 y=58

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=13 y=59

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=13 y=60

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=14 y=61

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=14 y=62

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=14 y=63

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=15 y=64

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=15 y=65

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=15 y=66

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=16 y=67

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=16 y=68

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=16 y=69

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=17 y=70

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=17 y=71

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=17 y=72

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=18 y=73

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=18 y=74

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=18 y=75

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-30 x=19 y=76

in second part incx=1 incy=1 inc1=-40 inc2=20 e=-10 x=19 y=77

in second part incx=1 incy=1 inc1=-40 inc2=20 e=10 x=19 y=78

in second part $incx=1$ $incy=1$ $inc1=-40$ $inc2=20$ $e=-30$ $x=20$ $y=79$

in second part $incx=1$ $incy=1$ $inc1=-40$ $inc2=20$ $e=-10$ $x=20$ $y=80$

Enter (x1, y1, x2, y2)

50 80 10 20

50 80

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=-20$ $x=49$ $y=79$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=60$ $x=49$ $y=78$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=20$ $x=48$ $y=77$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=-20$ $x=47$ $y=76$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=60$ $x=47$ $y=75$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=20$ $x=46$ $y=74$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=-20$ $x=45$ $y=73$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=60$ $x=45$ $y=72$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=20$ $x=44$ $y=71$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=-20$ $x=43$ $y=70$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=60$ $x=43$ $y=69$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=20$ $x=42$ $y=68$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=-20$ $x=41$ $y=67$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=60$ $x=41$ $y=66$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=20$ $x=40$ $y=65$

in second part $incx=-1$ $incy=-1$ $inc1=-40$ $inc2=80$ $e=-20$ $x=39$ $y=64$

in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=60 x=39 y=63
in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=20 x=38 y=62
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in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=20 x=36 y=59
in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=-20 x=35 y=58
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in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=20 x=18 y=32
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50 80

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in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=60 x=49 y=78

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in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=-20 x=47 y=76

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in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=20 x=14 y=26
in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=-20 x=13 y=25
in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=60 x=13 y=24

in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=20 x=12 y=23

in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=-20 x=11 y=22

in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=60 x=11 y=21

in second part incx=-1 incy=-1 inc1=-40 inc2=80 e=20 x=10 y=20

Enter (x1, y1, x2, y2)

10 80 50 10

10 80

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=11 y=79

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=11 y=78

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=12 y=77

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=12 y=76

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=13 y=75

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=13 y=74

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=14 y=73

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=15 y=72

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=15 y=71

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=16 y=70

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=16 y=69

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=17 y=68

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=17 y=67

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=18 y=66

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=19 y=65

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=19 y=64

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=20 y=63

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=20 y=62

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=21 y=61

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=21 y=60

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=22 y=59

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=23 y=58

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=23 y=57

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=24 y=56

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=24 y=55

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=25 y=54

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=25 y=53

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=26 y=52

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=27 y=51

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=27 y=50

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=28 y=49

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=28 y=48

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=29 y=47

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=29 y=46

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=30 y=45
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=31 y=44
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=31 y=43
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=32 y=42
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=32 y=41
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=33 y=40
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=33 y=39
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=34 y=38
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=35 y=37
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=35 y=36
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=36 y=35
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=36 y=34
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=37 y=33
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=37 y=32
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=38 y=31
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=39 y=30
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=39 y=29
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=40 y=28
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=40 y=27
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=41 y=26

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=41 y=25
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=42 y=24
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=43 y=23
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=43 y=22
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=44 y=21
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=44 y=20
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=45 y=19
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=45 y=18
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=46 y=17
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=47 y=16
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=47 y=15
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=48 y=14
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=48 y=13
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=49 y=12
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=49 y=11
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=50 y=10
10 80
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=11 y=79
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=11 y=78
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=12 y=77
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=12 y=76

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=13 y=75

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=13 y=74

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=14 y=73

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=15 y=72

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=15 y=71

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=16 y=70

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=16 y=69

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=17 y=68

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=17 y=67

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=18 y=66

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=19 y=65

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=19 y=64

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=20 y=63

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=20 y=62

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=21 y=61

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=21 y=60

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=22 y=59

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=23 y=58

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=23 y=57

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=24 y=56

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=24 y=55
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=25 y=54
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=25 y=53
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=26 y=52
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=27 y=51
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=27 y=50
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=28 y=49
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=28 y=48
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=29 y=47
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=29 y=46
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=30 y=45
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=31 y=44
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=31 y=43
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=32 y=42
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=32 y=41
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=33 y=40
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=33 y=39
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=34 y=38
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=35 y=37
in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=35 y=36

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=36 y=35

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=36 y=34

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=37 y=33

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=37 y=32

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=38 y=31

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=39 y=30

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=39 y=29

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=40 y=28

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=40 y=27

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=41 y=26

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=41 y=25

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=42 y=24

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=43 y=23

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=43 y=22

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=44 y=21

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=44 y=20

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=45 y=19

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=45 y=18

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=46 y=17

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-50 x=47 y=16

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=30 x=47 y=15

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-30 x=48 y=14

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=50 x=48 y=13

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=-10 x=49 y=12

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=70 x=49 y=11

in second part incx=1 incy=-1 inc1=-60 inc2=80 e=10 x=50 y=10

Enter (x1, y1, x2, y2)

50 10 10 80

50 10

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=49 y=11

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=49 y=12

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=48 y=13

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=48 y=14

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=47 y=15

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=47 y=16

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=46 y=17

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=45 y=18

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=45 y=19

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=44 y=20

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=44 y=21

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=43 y=22

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=43 y=23

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=42 y=24
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=41 y=25
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=41 y=26
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=40 y=27
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=40 y=28
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=39 y=29
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=39 y=30
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=38 y=31
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=37 y=32
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=37 y=33
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=36 y=34
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=36 y=35
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=35 y=36
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=35 y=37
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=34 y=38
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=33 y=39
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=33 y=40
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=32 y=41
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=32 y=42
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=31 y=43

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=31 y=44
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=30 y=45
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=29 y=46
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=29 y=47
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=28 y=48
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=28 y=49
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=27 y=50
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=27 y=51
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=26 y=52
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=25 y=53
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=25 y=54
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=24 y=55
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=24 y=56
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=23 y=57
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=23 y=58
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=22 y=59
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=21 y=60
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=21 y=61
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=20 y=62
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=20 y=63

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=19 y=64

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=19 y=65

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=18 y=66

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=17 y=67

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=17 y=68

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=16 y=69

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=16 y=70

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=15 y=71

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=15 y=72

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=14 y=73

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=13 y=74

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=13 y=75

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=12 y=76

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=12 y=77

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=11 y=78

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=11 y=79

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=10 y=80

50 10

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=49 y=11

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=49 y=12

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=48 y=13

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=48 y=14
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=47 y=15
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=47 y=16
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=46 y=17
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=45 y=18
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=45 y=19
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=44 y=20
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=44 y=21
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=43 y=22
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=43 y=23
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=42 y=24
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=41 y=25
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=41 y=26
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=40 y=27
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=40 y=28
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=39 y=29
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=39 y=30
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=38 y=31
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=37 y=32
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=37 y=33

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=36 y=34

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=36 y=35

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=35 y=36

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=35 y=37

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=34 y=38

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=33 y=39

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=33 y=40

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=32 y=41

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=32 y=42

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=31 y=43

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=31 y=44

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=30 y=45

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=29 y=46

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=29 y=47

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=28 y=48

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=28 y=49

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=27 y=50

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=27 y=51

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=26 y=52

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=25 y=53

in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=25 y=54
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=24 y=55
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=24 y=56
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=23 y=57
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=23 y=58
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=22 y=59
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=21 y=60
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=21 y=61
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=20 y=62
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=20 y=63
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=19 y=64
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=19 y=65
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=18 y=66
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-50 x=17 y=67
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=30 x=17 y=68
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-30 x=16 y=69
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=50 x=16 y=70
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=-10 x=15 y=71
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=70 x=15 y=72
in second part incx=-1 incy=1 inc1=-60 inc2=80 e=10 x=14 y=73

in second part $incx=-1$ $incy=1$ $inc1=-60$ $inc2=80$ $e=-50$ $x=13$ $y=74$

in second part $incx=-1$ $incy=1$ $inc1=-60$ $inc2=80$ $e=30$ $x=13$ $y=75$

in second part $incx=-1$ $incy=1$ $inc1=-60$ $inc2=80$ $e=-30$ $x=12$ $y=76$

in second part $incx=-1$ $incy=1$ $inc1=-60$ $inc2=80$ $e=50$ $x=12$ $y=77$

in second part $incx=-1$ $incy=1$ $inc1=-60$ $inc2=80$ $e=-10$ $x=11$ $y=78$

in second part $incx=-1$ $incy=1$ $inc1=-60$ $inc2=80$ $e=70$ $x=11$ $y=79$

in second part $incx=-1$ $incy=1$ $inc1=-60$ $inc2=80$ $e=10$ $x=10$ $y=80$

Enter (x1, y1, x2, y2)

20 20 60 20

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=21$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=22$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=23$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=24$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=25$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=26$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=27$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=28$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=29$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=30$ $y=20$

\in first part

$incx=1$ $incy=1$ $inc1=-80$ $inc2=0$ $e=-40$ $x=31$ $y=20$

\in first part

incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=32 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=33 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=34 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=35 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=36 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=37 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=38 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=39 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=40 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=41 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=42 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=43 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=44 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=45 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=46 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=47 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=48 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=49 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=50 y=20
\in first part
incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=51 y=20
\in first part

```

    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=52 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=53 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=54 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=55 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=56 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=57 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=58 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=59 y=20
\in first part
    incx=1 incy=1 inc1=-80 inc2=0 e=-40 x=60 y=20

```

Enter (x1, y1, x2, y2)

10 50 10 10

10 50

```

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=49

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=48

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=47

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=46

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=45

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=44

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=43

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=42

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=41

```

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=40
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=39
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=38
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=37
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=36
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=35
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=34
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=33
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=32
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=31
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=30
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=29
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=28
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=27
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=26
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=25
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=24
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=23
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=22
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=21

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=20

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=19

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=18

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=17

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=16

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=15

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=14

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=13

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=12

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=11

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=10
10 50

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=49

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=48

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=47

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=46

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=45

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=44

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=43

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=42

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=41

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=40
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=39
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=38
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=37
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=36
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=35
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=34
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=33
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=32
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=31
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=30
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=29
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=28
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=27
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=26
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=25
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=24
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=23
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=22
in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=21

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=20

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=19

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=18

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=17

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=16

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=15

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=14

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=13

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=12

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=11

in second part incx=1 incy=-1 inc1=-80 inc2=0 e=-40 x=10 y=10

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