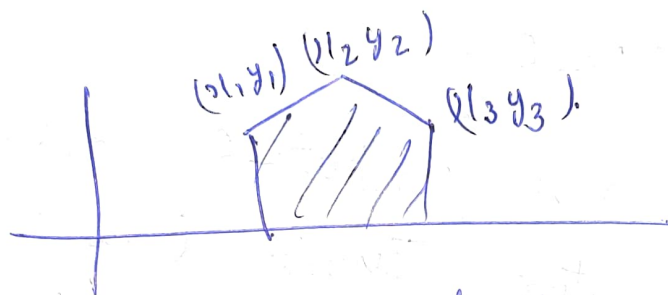
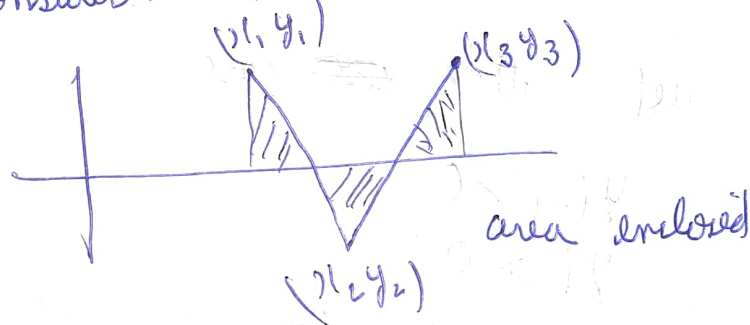


Assignment 1

In this assignment we have to find area under the curve by joining series of  $n$  successive points



Hence here the area enclosed in the negative side is considered  $+$  also.



### • (Users Interface on Console:)

— "Please Enter the No. of Points ( ~~$n > 0$~~ ) ("Enter 0 to terminate");"

If 0 is given the function terminates and moves out of the loop. but else it asks the

for  $n$ ,  $(x, y)$  pairs. → "0 is entered function terminates"

If  $n < 0$  is provided then error message

→ "No. of points can't be negative Please provide a positive  $n$ "

Once a proper  $n$  is provided  
the console asks for the  $(x_i, y_i)$  pair as

- "Please enter  $x$  coordinate of no.  $i$ :"  
→ "Please enter  $y$  coordinate of point no.  $i$ :"

After getting a  $(x_i, y_i)$  we compute the  
~~are~~ present area through past value  
 $(x_{i-1}, y_{i-1})$ .

Two cases

- 1)  $x_{i-1} < x_i$  then we give an error.  
→ "The  $x$  coordinates of the point need to  
be in sorted order  $n$ "  
and ask for  $x$  coordinate again.

- 2) after  $x_i$  passing above test we check  
 $y_{i-1} < 0$  then we move to branch

- 3) In branch if we get  $y_i < 0$   
we use compute-1 for computing the area  
using the formula of area of trapezium

- 4) In branch if we get  $y_i > 0$  we ~~use~~ <sup>use</sup> load <sup>and compute-2</sup> for  
computing the area using two  $\Delta$  triangles

- 5) If we don't go to branch then

$$y_{i-1} > 0$$

and we get

the case  $y_i < 0$

then use ~~test~~ and compute 2 for computing

the area using two triangles

b) Else we get the case

$$y_{i-1} > 0$$

$$y_i > 0$$

We use compute-1 for computing the area using the formula of area of trapezium.

This loop continues for  $n$  times and gets us the final area after all computation.

→ "The area under the curve for given points:"

Test Cases:

To test the code we took covered all the case

1) 2  
 $(1, 1) \rightarrow 0$   
 $(1, 1) \rightarrow 0$

2) 2  
 $(0, 0) \rightarrow 0$   
 $(0, 0) \rightarrow 0$

3) 2  
 $(2, 0) \rightarrow 0$   
 $(3, 0) \rightarrow 0$

4) 1  
 $1 \rightarrow 0.5$

4) 2  
 $1 \rightarrow 0.5$

5) -1 1  
 $-1 2 \rightarrow 0$

Also big uses like:

5

(477, -61)

(1081, -342)

(1901, -67)

(2116, -455)

(2651, -218)

→ 525538.5

which is the correct answer.

4

(1, 10)

(3, -23)

(21, 7)

(22, -1)

→ 195.585...

which is the correct answer.

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