Testing:

Testing is done casewise by taking corner cases of inputs, overflows, bad inputs

1. Bad number of inputs:

```
Enter number of points: -2

Bad number of points!
Number of Points must be greater than 0...
Program Terminated
```

-

```
Enter number of points: 0

Bad number of points!
Number of Points must be greater than 0...
Program Terminated
```

-

2. With single point:

Area of single point is 0 irrespective of its x and y coordinates

```
Enter number of points: 1
Final calculated Area is : 0
Program Terminated
```

3. With 2 points such that positive area = negative area:

3 points at (-10000,-10000), (0,0), (10000,10000). Area1 = Area2. Hence, Area = Area1+Area2= 1/2*10000 *10000 * 2 = 50000000 *2 = 100000000

```
Enter number of points: 3
Enter Data for point no. 1
X coordinate : -10000
Y coordinate : -10000
Area so far : 0
Enter Data for point no. 2
X coordinate : 0
Y coordinate : 0
Area so far : 50000000
Enter Data for point no. 3
X coordinate : 10000
Y coordinate : 10000
Area so far : 100000000
Final calculated Area is : 100000000
Program Terminated
```

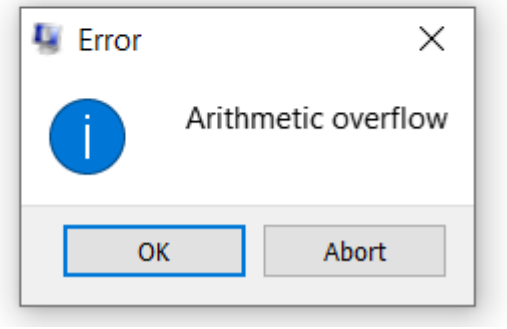
4. With Large X and Y coordinate to check oveflow:

Works till 10^8 x and y range. When y**2 crosses 64-bit limit overflow occurs

```
Enter number of points: 2
Enter Data for point no. 1
X coordinate : -1000000000
Y coordinate : -1000000000
Area so far : 0
Enter Data for point no. 2
X coordinate : 1000000000
Y coordinate : 1000000000
Area so far : 1e+018
Final calculated Area is : 1e+018
Program Terminated
```

When y**2 crosses 64-bit limit overflow occurs

```
Enter number of points: 2
Enter Data for point no. 1
X coordinate : -2000000000
Y coordinate : -2000000000
Area so far : 0
Enter Data for point no. 2
X coordinate : 2000000000
Y coordinate : 2000000000
```



5. Points with same X coordinate:

for same x coordinate width of curve is 0 hence area should be 0 irrespective of height

```
Enter number of points: 2
Enter Data for point no. 1
X coordinate : 0
Y coordinate : 0
Area so far : 0
Enter Data for point no. 2
X coordinate : 0
Y coordinate : 10000
Area so far : 0
Final calculated Area is : 0
Program Terminated
```

6. Decimal area:

2 points at (0,0), (69,89). Area = (69-0)_(89+0)/2=69 _ 89/2 = 6141/2 = 3070.5

```
Enter number of points: 2
Enter Data for point no. 1
X coordinate : 0
Y coordinate : 0
Area so far : 0
Enter Data for point no. 2
X coordinate : 69
Y coordinate : 89
Area so far : 3070.5
Final calculated Area is : 3070.5
Program Terminated
```

7. Random numbers:

This test case contain all the 4 cases of area mentioned above.

y1>0, y2>0; y1<0, y2>0; y1<0, y2<0; y1>0, y2<0;

```
Enter number of points: 10
Enter Data for point no. 1
X coordinate : 4
Y coordinate : -6
Area so far : 0
Enter Data for point no. 2
X coordinate : 5
Y coordinate : 10
Area so far : 4.25
Enter Data for point no. 3
X coordinate : 6
Y coordinate : 15
Area so far : 16.75
Enter Data for point no. 4
X coordinate : 7
Y coordinate : 13
Area so far : 30.75
Enter Data for point no. 5
X coordinate : 8
Y coordinate : -16
Area so far : 38.077586206896555
Enter Data for point no. 6
X coordinate : 10
Y coordinate : 23
Area so far : 58.205791335101679
Enter Data for point no. 7
X coordinate : 15
Y coordinate : 100
Area so far : 365.70579133510171
Enter Data for point no. 8
X coordinate : 16
Y coordinate : -3
Area so far : 414.29316997587841
Enter Data for point no. 9
X coordinate : 17
Y coordinate : 5
Area so far : 416.41816997587841
Enter Data for point no. 10
X coordinate : 20
Y coordinate : 20
Area so far : 453.91816997587841
Final calculated Area is : 453.91816997587841
Program Terminated
```

which matches with actual calculated area = 453.918