

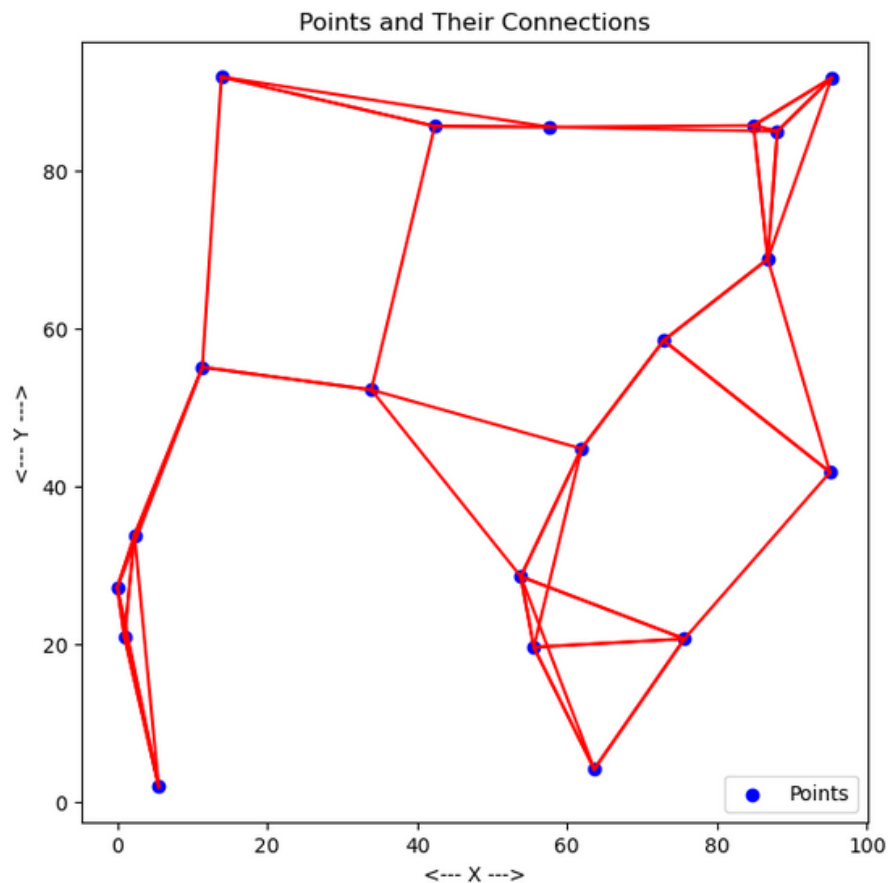
REPORT

1. In this problem I have taken string in which it contains all the decimal places of π and then I run a loop in the string find the required value.

```
ch22b057@ID2090:~$ date
Mon May 29 01:29:59 PM UTC 2023
ch22b057@ID2090:~$ ./assn2a.sh pie 2
4_circles(coef):
```

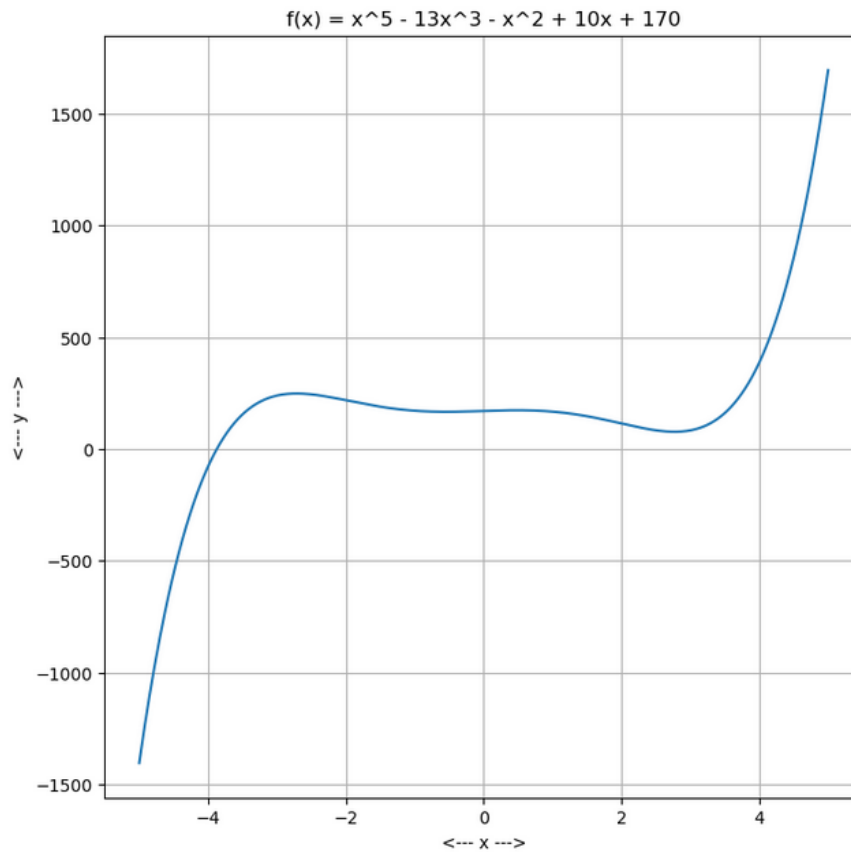
2. In this problem we have taken 20 random numbers and then made an array of distance between the points then we have sorted them wrt distance.

Then we have connected 3 nearest points and connected the points.



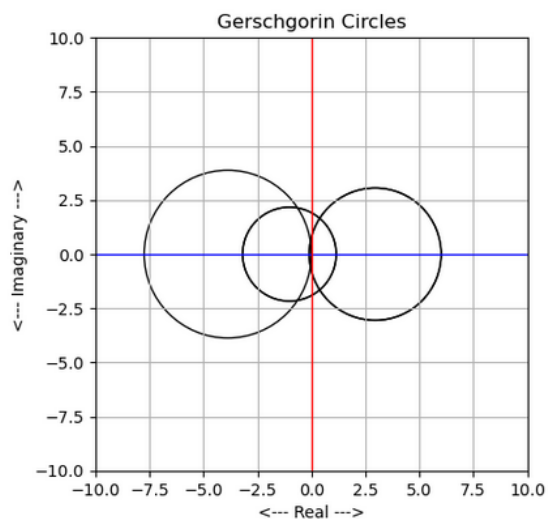
3. In this problem we have to first plot the function using numpy and matplotlib.pyplot in python then our task was to find the roots and tell the number of roots. I have found the roots using python functions.

At last I made Gerschgorin-Circle it gives a rough idea of roots where it is present. Then I code for the circle center and the radius and I have plotted it.



Number of real roots: 1

Roots: $[-3.87312796+0.j \quad 2.95501052+0.7794618j \quad 2.95501052-0.7794618j$
 $-1.01844654+1.91371887j \quad -1.01844654-1.91371887j]$



4. In this problem I have taken help of in-built function `cubic spline` to interpolate the given data and then I have plotted its graph.

To do polynomial interpolation I have used `polyfit` in-built function in python and plotted the graph.

When I compared them there were range in which it was coinciding mostly later I deviated.

