Norm of a matrix

Aim

To write a program to find the 1-norm, 2-norm and infinity norm of the matrix and display the result in two decimal places.

Equipment's required:

1. Hardware – PCs
2. Anaconda – Python 3.7 Installation / Moodle-Code Runner

Algorithm:

1. Get the input matrix using np.array()
2. Find the 2-norm of the matrix using np.linalg.norm()
3. Print the norm of the matrix in two decimal places.

Program:

```
# Register No:
# Developed By:
# 1-Norm of a Matrix
import numpy as np
mat=np.array(eval(input()))
ans=np.linalg.norm(mat,1)
norm="{:.2f}".format(ans)
print(norm)

# 2-Norm of a Matrix

import numpy as np
mat=np.array(eval(input()))
ans=np.linalg.norm(mat,2)
print("{:.2f}".format(ans))


# Infinity Norm of a Matrix

import numpy as np
mat=np.array(eval(input()))
```

```
ans=np.linalg.norm(mat,np.inf)
print("{:.2f}".format(ans))
```

Output:

1-Norm of a Matrix

	Input	Expected	Got	
✔	[[-1, 3],[3, -4],[1, 7]]	14.00	14.00	✔
✔	[[1, 2, 3],[-3,-4,-1],[9,6,1]]	13.00	13.00	✔

Passed all tests! ✔

2-Norm of a Matrix

	Input	Expected	Got	
✔	[[1,2],[3,4]]	5.46	5.46	✔
✔	[[-1, 3],[3, -4],[1, 7]]	8.66	8.66	✔
✔	[[2, 3],[3, 4],[1, 8]]	9.86	9.86	✔

Passed all tests! ✔

Infinity Norm of a Matrix

	Input	Expected	Got	
✔	[[-1, 3],[3, -4],[1, 7]]	8.00	8.00	✔
✔	[[1,2,3],[-9,-8,-3],[10,3,2]]	20.00	20.00	✔

Passed all tests! ✔

Result

Thus the program for 1-norm, 2-norm and Infinity norm of a matrix are written and verified.