COSC 343: Test 1

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1 vector P-Norm

Listing 1: vector p-norm

```
import numpy as np
import matplotlib


def p_norm(vec, p):
    sum = 0
    for element in vec:
        sum += np.abs(element) ** p
    return sum ** (1/p)
```

2 Matrix 1 norm

Listing 2: matrix 1-norm

```
import numpy as np
import matplotlib


def one_norm(matrix):
    max = 0
    for j in range(len(matrix[0])):
        sum = 0
        for i in range(len(matrix)):
            sum += np.abs(matrix[i][j])
        if sum > max:
            max = sum
    return max
```

3 Matrix ∞ norm

Listing 3: matrix ∞ norm

```
import numpy as np
import matplotlib

def inf_norm(matrix):
    max = 0
    for i in range(len(matrix)):
        sum = 0
        for j in range(len(matrix[0])):
            sum += np.abs(matrix[i][j])
        if sum > max:
```

```
            max = sum
    return max
```