Name: D R YUVAM

College Roll No.: CSC/20/48

PROGRAM 2:

File Handling

(a): Load data from a text file (file should contain matrix data)

(b) Use commands to compute the:
(i) size of the matrix
(ii) size/length of a particular row/column

(c) . store matrix data to a text file

sample.txt

```
1,2,3,4,5,6,7,8,9@3,3
21,23,45,65,67,98,32,46,21,23,99,89@4,3
```

CODE:

```
import numpy as np
# Part (a)
def getData():
    # file opening , reading the values
    with open("sample.txt") as matrixData:
        for line in matrixData.readlines():
            data,dim = line.replace("\n","").split("@")
            rows,cols = int(dim[0]),int(dim[2])
            # creating matrix according to the data
            createMatrix(data,rows,cols)

def createMatrix(data,rows,cols):
    matrix,arr,counter,data= [],[],0,data.split(",")
    for i in range(rows):
        for j in range(cols):
            arr.append(int(data[counter]))
            counter += 1
        matrix.append(arr)
        arr = []
    print("Matrix\n",np.array(matrix))
    print("Shape ==> ",np.shape(matrix))
```

```
    size = compute(matrix)
    saveData(size,matrix)

# Part (b)
def compute(matrix):
    print("Size of matrix ==> ",np.size(matrix))
    for i in range(np.shape(matrix)[0]):
        print("Row Data ==> ",matrix[i],"\n Size of Row ==> ",len(matrix[i]))
    return np.size(matrix)

def saveData(size,matrix):
    with open("dataMatrix.txt","a") as fh:
        fh.writelines(f"{matrix}\nSize of Matrix {size}\n")

if __name__ == "__main__":
    getData()
```

OUTPUT:

```
Matrix
 [[1 2 3]
 [4 5 6]
 [7 8 9]]
Shape ==>  (3, 3)
Size of matrix ==>  9
Row Data ==>  [1, 2, 3]
 Size of Row ==>  3
Row Data ==>  [4, 5, 6]
 Size of Row ==>  3
Row Data ==>  [7, 8, 9]
 Size of Row ==>  3
Matrix
 [[21 23 45]
 [65 67 98]
 [32 46 21]
 [23 99 89]]
Shape ==>  (4, 3)
Size of matrix ==>  12
Row Data ==>  [21, 23, 45]
 Size of Row ==>  3
Row Data ==>  [65, 67, 98]
 Size of Row ==>  3
Row Data ==>  [32, 46, 21]
 Size of Row ==>  3
Row Data ==>  [23, 99, 89]
 Size of Row ==>  3
```

dataMatrix.txt

dataMatrix.txt

```
1  [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
2  Size of Matrix 9
3  [[21, 23, 45], [65, 67, 98], [32, 46, 21], [23, 99, 89]]
4  Size of Matrix 12
5
```

GITHUB : ALL CODE