

Data Structure 2018

Lab 05

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Array

1-dimensional array

Declaration in java: `Object [] obj = new obj[size];`

2-dimensional array

Declaration in java: `Object [][] obj = new obj[column][row];`

Today's Work

Practice 1:

There is a collection of input strings and a collection of query strings. For each query string, determine how many times it occurs in the list of input strings.

For example, given input `strings=['ab', 'ab', 'abc']` and queries = `['ab', 'abc', 'bc']`, we find 2 instances of 'ab', 1 of 'abc' and 0 of 'bc'. For each query, we add an element to our return array, `results=[2,1,0]` .

Today's Works

Input Format:

The first line contains an integer n , the size of `strings`.

Each of the next n lines contains a string `strings[i]`.

The next line contains q , the size of `queries`.

Each of the next q lines contains a string `q[i]`.

Today's Works

Array: strings

aba	baba	aba	xzxb
-----	------	-----	------

Array: queries

aba	xzxb	ab
-----	------	----

4
aba
baba
aba
xzxb
3
aba
xzxb
ab

Sample Output

2
1
0

Expected Output

Input (from file)

```
13
abcde
sdaklfj
asdjf
na
basdn
sdaklfj
asdjf
na
asdjf
na
basdn
sdaklfj
asdjf
5
abcde
sdaklfj
asdjf
na
basdn
```

Output

```
1
3
4
3
2
```

Today's Work

Practice 2: Matrix Multiplication

$$(m1m2)_{ij} = \sum_{k=1}^m m1_{ik} m2_{kj}$$
$$\mathbf{A} = \begin{pmatrix} A_{11} & A_{12} & \cdots & A_{1m} \\ A_{21} & A_{22} & \cdots & A_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ A_{n1} & A_{n2} & \cdots & A_{nm} \end{pmatrix}, \quad \mathbf{B} = \begin{pmatrix} B_{11} & B_{12} & \cdots & B_{1p} \\ B_{21} & B_{22} & \cdots & B_{2p} \\ \vdots & \vdots & \ddots & \vdots \\ B_{m1} & B_{m2} & \cdots & B_{mp} \end{pmatrix}$$
$$\mathbf{AB} = \begin{pmatrix} (\mathbf{AB})_{11} & (\mathbf{AB})_{12} & \cdots & (\mathbf{AB})_{1p} \\ (\mathbf{AB})_{21} & (\mathbf{AB})_{22} & \cdots & (\mathbf{AB})_{2p} \\ \vdots & \vdots & \ddots & \vdots \\ (\mathbf{AB})_{n1} & (\mathbf{AB})_{n2} & \cdots & (\mathbf{AB})_{np} \end{pmatrix}$$

Today's Work

Your main should look like this (everything should be done on console):

```
Enter the number of rows and columns of first matrix: //ex: 2 3
//#a.row and #a.col
Matrix a = new Matrix(a.row, a.col);
Enter elements of first matrix: //ex: 2.0 1.1 2.5 3.1 4.8 6.2
//enter elements (it should be double)
Enter the number of rows and columns of second matrix:
//#b.row and #b.col
Matrix b = new matrix(#b.row, #b.col);
Enter elements of second matrix:
//enter elements (it should be double)
Product of the matrices:
//ex: 1.2 1.3
      5.6 1.4
a.multiply(b)
if(a.col!= b.row) → "The matrices can't be multiplied with each other."
```