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## **Program 3 Report**

### **Abstract**

This report contains the problem statement for Program 3, my approach to coding the program, my test results, and conclusions about what I learned while coding it.

### **Problem Statement**

Each student will write a Julia program to compute the Spider Man numbers of a set of Marvel characters. Specifically, the program should take as input an arbitrary number of Marvel characters – either as integer indexes (easiest) or strings – and for each of these characters, print the character's name and their Spider Man number.

### **Approach**

The method to reading in the network is done simply by reading in each value into a separate array for characters and comics, and a matrix for appearances. A sparse matrix is created by multiplying appearances by its transpose, which is then passed to the Spidey number function.

The Spidey number is calculated by creating a Boolean matrix from the sparse matrix, then going through this matrix to find the levels of separation of each character. An array set to -1's has the numbers of characters who have appeared directly with Spiderman set to 1's, then characters

who have not appeared with Spiderman but have appeared with those characters set to 2, and so on.

It is then a simple matter of printing the character desired by the user's info, their name and Spidey number, simply by accessing those arrays and printing their contents at the user entered index.

## Results

```
julia> include("marvel.jl")
Reading Marvel universe network
Calculating Spidey Numbers
Enter the numbers (1 - 6486) of marvel characters (one at a
time)
1
  1 "24-HOUR MAN/EMMANUEL" : 3
2
  2 "3-D MAN/CHARLES CHAN" : 1
3
  3 "4-D MAN/MERCURIO"      : 2
95
  95 "AMAZO-MAXI-WOMAN/"    : >6
389
  389 "BAV-TEK"              : 3
957
  957 "CERA, KAY"            : 1
1082
  1082 "CLINTON, BILL"       : 1
1089
```

1089 "CLUMSY FOULUP" : >6  
1388  
1388 "DE LA SPIROSA, COUNT" : 2  
1711  
1711 "EL TORO ROJO" : 2  
1841  
1841 "FENRIS" : >6  
2052  
2052 "ÁGAMORA" : 1  
2216  
2216 "GREASE" : 2  
2262  
2262 "GROSS, IRA" : 1  
2483  
2483 "HITLER, ADOLF" : 2  
2908  
2908 "KUBIK" : 2  
3202  
3202 "LITTLE, ABNER" : 2  
3481  
3481 "MARTINEZ, ALITHA" : 1  
3863  
3863 "MYLZOB'RYN, CHIEF" : 3  
4033  
4033 "O'KEEFE, CHANDRA" : 1  
4095  
4095 "OSWALD" : >6  
4387

4387 "PSI-BORG/" : 2  
4575  
4575 "REAGAN, NANCY" : 2  
4630  
4630 "REPTYL" : 1  
4750  
4750 "ROSE, MICHKA" : 3  
5306  
5306 "SPIDER-MAN/PETER PAR" : 0  
5705  
5705 "THANOS" : 1  
6411  
6411 "ZANTOR" : >6  
6452  
6452 "ZURI" : 1  
6484  
6484 "STORMER" : 3  
6486  
6486 "ZONE" : 2

ZDEUFH

Invalid Input. Enter a number between 1 and 6486. Enter -9  
to escape

0

Invalid Input. Enter a number between 1 and 6486. Enter -9  
to escape

88888

Invalid Input. Enter a number between 1 and 6486. Enter -9  
to escape

Invalid Input. Enter a number between 1 and 6486. Enter -9 to escape

-9

Program Exited.

julia>

## Conclusions

Throughout the coding process, I learned many things about Julia syntax (goto, ends, @ symbols), and command line arguments for Julia, as well as using the debugger and using Atom/Juno in general. I also learned about sparse matrices and their implementation in Julia.