CMSC 401 – Fall 2016

Assignment 1
(due Thursday 9/22 – 11:59pm)

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CMSC 401- Algorithm Analysis with Advanced Data Structures

VCU

School of Engineering | Computer Science

Inversion Vector

- Your task is to design and implement an algorithm to convert permutation inversion vector W into the corresponding permutation A
- For a permutation A of numbers 1..N:
  - Inversion vector W of length N has j^{th} element W[j] defined as:
  - W[j] = number of elements in A[1.. j-1] that are larger than A[j]
  - 0<=W[j]<=j-1
- To obtain permutation A from permutation inversion vector W of length N
  - Read W from end, fill A from the end with unused elements from 1..N
- Ex: with N=5, W=[0,1,1,1,2] => A=[5,1,2,4,3]
- See also Lecture 04, slides 28-32.

Input-output formats

- Take integers from **standard input** (**System.in**):
  - Line 1: single integer specifying N: number of elements in permutation (1<=N<=1000) (N = length of W = length of A)
  - Lines 2 to N+1: line j contains an integer that goes into W[j-1]
- print permutation A corresponding to the input inversion vector W to **standard output (System.out)**, with each integer on a separate line

- As always, do not print any text or blank lines to standard output except the integers

-Example:

-Input:

```
5
0
1
1
1
2
```

-Correct Output:

```
5
1
2
4
3
```

Submission

- Date due: Thursday, Sept 22th, 11:59 pm

- Upload through Blackboard
  - Your submission should be a zip archive 1_FamilyName_FirstName.zip containing
    - Java source code in a file cmsc401.java (**all low case letters!**)
      - The file should have your name in a comment in the first line
      - Remember: in Java, class name should match the file name, and is case sensitive

- Please do NOT use packages
- Do NOT place the file into a folder – just zip the file