

Quiz 4



Sample

This quiz consists of 1 question. You have 7 minutes.

Assume the ArmLab/gcc217 environment unless otherwise stated in a problem.

Do all of your work on these pages. This quiz is preprocessed by computer, so for your final answers to be scored you must write them inside the designated spaces. Please make text answers dark and neat.

Name: NetID:

This is a closed-book, closed-note quiz. Please place items that you will not need out of view in your bag or under your working space at this time. Electronic devices such as cell phones, laptops, smartwatches except to check the time, etc. may not be used during this quiz.

This quiz is administered under the Princeton University Honor Code. All suspected violations of the Honor Code must be reported to honor@princeton.edu.

In the box below, copy **and** sign the Honor Code pledge before turning in your quiz:
"I pledge my honor that I have not violated the Honor Code during this examination."

X _____

The question is on the back of this page. Do not turn this page over until instructed to begin.

Question 1 (7 points)

Each node in the trees from A4 has a unique non-empty absolute path that uses '/' as the component delimiter and neither begins nor ends with '/' nor contains consecutive '/' delimiters. The nodes' paths could be implemented as an ADT with this possible internal representation:

```
struct Path {
    /* String representation of the '/'-delimited path. */
    char *pcPath;
    /* String length of pcPath */
    size_t ulLength;
    /* Number of components of pcPath, e.g., 'P/seas/cos217' is 3 */
    size_t ulDepth;
};
```

Write an invariant checker for this implementation of the Path ADT in the box below. Your checker should include **four** invariant checks beyond the two we have already implemented. Partial credit will be given for correctly described invariants, even if the invariant checker implementation is incorrect.

```
#include <string.h>
static int Path_isValid(char *pcPath, size_t ulLength, size_t ulDepth) {
    /* declare any local variables needed for your checks here */

    /* sample invariants: pcPath is not NULL and not the empty string */
    if(pcPath == NULL) return 0;
    if(pcPath[0] == '\0') return 0;

    return 1;
}
```