

COP 3502 Section 16 Quiz #1 - Part B (Linked Lists) Solutions

Date: 5/29/2020

Start Time: 1:55 pm EST

End Time: 2:20 pm EST

For all questions on this section (except the last), imagine storing strings as linked lists of nodes that store individual characters. Here is the struct that will be used:

```
typedef struct charnode {
    char c;
    struct charnode* next;
} charnode;
```

The string represented by a linked list of nodes is simply the characters, read in order from the front to the back of the list. The next pointer for the last character in the string will be set to NULL. For each question, you'll be asked to write a function that takes in a pointer to the front of the linked list representing a string and either returning or processing some information about the string.

1) (10 pts) Write a function that takes in a pointer to the front of a linked list storing a string and returns the length of that string. Note if front is NULL that represents a string of length 0. The function prototype is provided:

```
int stringlen(charnode* front);
```

Solution

```
int stringlen(charnode* front) {
    int res = 0;

    while (front != NULL) {
        res++;
        front = front->next;
    }
    return res;
}
```

Grading: 1 pt copy prototype, 1 pt set result to 0, 2 pts loop, 2 pts update result, 3 pts go to next node, 1 pt return. Note: Take off 1 pt total if there is are error(s) between a dot versus an arrow.

2) (10 pts) Write a void function that takes in a pointer to the front of a linked list storing a string and CHANGES that string to be upper case. (So all lower case letters are converted to upper case letters and all other characters are left the same. Recall that there is a macro in ctype.h called toupper, which takes in a character and returns its uppercase version. (This does exactly what you want - if you pass in something other than a lower case letter, it returns the same exact character it received as input.) The function prototype for the function you are supposed to write and toupper is provided. Please use toupper in your code.

```
/* Even though the prototype has toupper taking in an int, it's
meant
to take in a character. If that character is a lower case
letter, the
corresponding uppercase letter is returned. Otherwise, arg is
returned. */
int toupper(int arg);

void convertToUpper(charnode* front);
```

Solution

```
void convertToUpper(charnode* front) {

    while (front != NULL) {
        front->c = toupper(front->c);
        front = front->next;
    }
}
```

**Grading: 1 pt copy prototype,
2 pts loop,
4 pts front->c = toupper(front->c),
3 pts go to next node**

Note: Take off 1 pt total if there is are error(s) between a dot versus an arrow. (Thus, if a student did this on both questions, they will lose a total of 2 pts out of the full 25 for this part.)

3) (5 pts) What common breakfast food can you get at Omlet Bar? **Omlet**

Grading: Give 5 pts to all who submit the exam, regardless of whether they answered this question.