Assignment 2 – Struct and Buffer

Description:

We'll learn to practice with structures, pointers, character strings, enumerated types, bitmap fields, and how to buffer data into blocks while using memory allocations through in this assignment.

Approach / What I Did:

1. Open the VirtualBox, use terminal git clone assignment 2 from Github
2. Using terminal create a c file by using "touch Gu_Jiayi_HW2_main.c"
3. Reading the requirement from Github README.md
4. Follow each step, initialized pointer and finish fill out the struct part
5. Try to figure out how to do memory allocate and how to finish the step six -> buffer
6. Check what is the getNext() by using output the value
7. Think a correctly way to solve the buffer step questions
8. After finishing all steps for coding part, check each part and revise comments
9. Right now: doing the documentation part

Issues and Resolutions:

I was confused that what the getNext() do when I was trying to complete step six, and I tried to print out the getNext() to take a look at what kind of values it has. I found that getNext() will get some part of the string, and it shows like a text message. When each time the getNext() method calls, it will return some parts of the text message, until returns all of it by calling it again and again. In my opinion, I would like to use a while loop to call the getNext() function,

again and again, to make sure I can get all of the messages out. Then, another question jumped into my head how can I control the size of it (BLOCK_SIZE) to make sure the size is 256 then commit it? In this way, I think using a memory copy is a good idea so that I can figure out the size of the buffer, however, when I finish coding everything, it seems like doesn't work correctly due to some error. Then, I tried to figure out these questions for a long time but still doesn't work. I think it might be the memory location is wrong for my code. Furthermore, I change my mind, I tried to use for loop to store each character from the getNext() method output, and put them into the buffer each by each. Honestly, it isn't a clever way to run all code successfully, but it can work!

Analysis:

```
-------------------------------- CHECK --------------------------------
Running the check for Jiayi Gu
Name check is 0 by 0
Student ID: 920024739, Grade Level: Senior
Languages: 68639 (10C1F)
Message:
Four score and seven years ago our fathers brought forth on this continent, a ne
w nation, conceived

The Check Succeded (0, 0)

END-OF-ASSIGNMENT
000000: 9D F2 D4 5B FF 7F 00 00  A3 F2 D4 5B FF 7F 00 00 | ???[?..???[?..
000010: A3 76 D6 36 03 00 00 00  1F 0C 01 00 46 6F 75 72 | ?v?6........Four
000020: 20 73 63 6F 72 65 20 61  6C 64 20 73 65 76 65 6E |  score and seven
000030: 20 79 65 61 72 73 20 61  67 6F 20 6F 75 72 20 66 |  years ago our f
000040: 61 74 68 65 72 73 20 62  72 6F 75 67 68 74 20 66 | athers brought f
000050: 6F 72 74 68 20 6F 6E 20  74 68 69 73 20 63 6F 6E | orth on this con
000060: 74 69 6E 65 6E 74 2C 20  61 20 6E 65 77 20 6E 61 | tinent, a new na
000070: 74 69 6F 6E 2C 20 63 6F  6E 63 65 69 76 65 64 20 | tion, conceived
```

In red square: present the address of my first name

In blue square: present the address of my last name

(printf("%p\n%p\n",myInfo->firstName, myInfo->lastName); -> can printout the address which is allocated my first name and last time

In orange square: present the address of my student ID

(printf("%p", myInfo->studentID)) -> can printout the address which is allocated my student ID
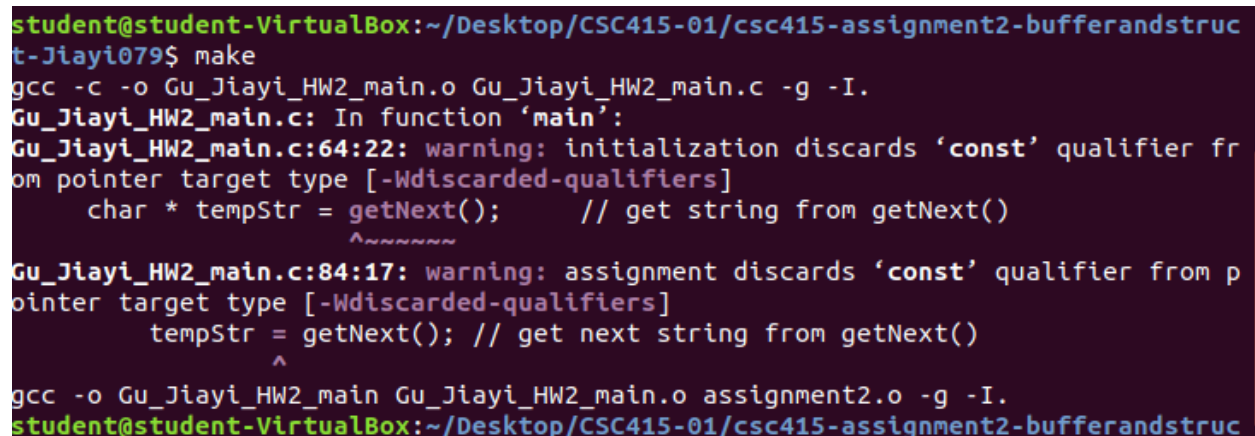
In green square: present the address of my level

(printf("%p", myInfo->level)) -> can printout the address which is allocated my level (senior)

In pink square: present the address of my languages

(printf("%p", myInfo->languages);) -> can printout the address which is allocated my languages

After bytes present the messages which is the 3rd command argument form the command line.

Screen shot of compilation:

```
student@student-VirtualBox:~/Desktop/CSC415-01/csc415-assignment2-bufferandstruc
t-Jiayi079$ make
gcc -c -o Gu_Jiayi_HW2_main.o Gu_Jiayi_HW2_main.c -g -I.
Gu_Jiayi_HW2_main.c: In function 'main':
Gu_Jiayi_HW2_main.c:64:22: warning: initialization discards 'const' qualifier fr
om pointer target type [-Wdiscarded-qualifiers]
     char * tempStr = getNext();      // get string from getNext()
                      ^~~~~~~
Gu_Jiayi_HW2_main.c:84:17: warning: assignment discards 'const' qualifier from p
ointer target type [-Wdiscarded-qualifiers]
         tempStr = getNext(); // get next string from getNext()
                 ^
gcc -o Gu_Jiayi_HW2_main Gu_Jiayi_HW2_main.o assignment2.o -g -I.
student@student-VirtualBox:~/Desktop/CSC415-01/csc415-assignment2-bufferandstruc
```

Screen shot(s) of the execution of the program:

```
student@student-VirtualBox:~/Desktop/CSC415-01/csc415-assignment2-bufferandstruc
t-Jiayi079$ make run
./Gu_Jiayi_HW2_main Jiayi Gu "Four score and seven years ago our fathers brought
 forth on this continent, a new nation, conceived in Liberty, and dedicated to t
he proposition that all men are created equal."
-------------------------------- CHECK --------------------------------
Running the check for Jiayi Gu
Name check is 0 by 0
Student ID: 920024739, Grade Level: Senior
Languages: 68639 (10C1F)
Message:
Four score and seven years ago our fathers brought forth on this continent, a ne
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000010: A3 76 D6 36 03 00 00 00  1F 0C 01 00 46 6F 75 72 | ?v?6........Four
000020: 20 73 63 6F 72 65 20 61  6E 64 20 73 65 76 65 6E |  score and seven
000030: 20 79 65 61 72 73 20 61  67 6F 20 6F 75 72 20 66 |  years ago our f
000040: 61 74 68 65 72 73 20 62  72 6F 75 67 68 74 20 66 | athers brought f
000050: 6F 72 74 68 20 6F 6E 20  74 68 69 73 20 63 6F 6E | orth on this con
000060: 74 69 6E 65 6E 74 2C 20  61 20 6E 65 77 20 6E 61 | tinent, a new na
000070: 74 69 6F 6E 2C 20 63 6F  6E 63 65 69 76 65 64 20 | tion, conceived

student@student-VirtualBox:~/Desktop/CSC415-01/csc415-assignment2-bufferandstruc
t-Jiayi079$
```