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Github: tzphuang CSC415 Operating Systems

Assignment 2a – Struct and Buffer

Description:

Assignment 2a – Struct and Buffer was an assignment to write a C program that statically inputs user data into the code such as grade level/name/ student id/ known languages/ and command line inputs. The program also takes a string of characters and copies them into a buffer block to be committed within a loop until there are no new strings to commit to the buffer block.

Approach / What I Did:

Essentially, I broke the assignment up into 2 major parts, the first part was the assignment of information where I just input all my relevant information into the structure given to be committed. The second part of the assignment was dealing with the block buffering. This block buffering was broken down into another 2 parts where I had to take the idea of buffering and break it down to "if the nextString fits into my buffer, memcpy it inside immediately and then grab a new nextString while setting my index for beginning of the free space I have left for my block buffer is" or "if the nextString partially fits into my buffer, memcpy what I need to fill my block buffer and then memcpy what is left into a partial buffer block and setting my nextString pointer to that while updating how long is the leftover partial string."

Issues and Resolutions:

Lots of issues occurred during this assignment from segmentation faults to using the wrong functions when coding. I had used strncat() at first to do this assignment and that was completely wrong as it caused many issues with my output where I assumed that strncat would concatenate onto an empty malloc block but this was not the case. A malloced block can have information leftover from previous usage so concatenating onto it can lead to loss of information as previous information maybe still there on the heap. This was solved by lots printf statements and changing the usage of strncat to memcpy.

Analysis:

(in reference to the screenshot of execution below)
> 88 72 82 76 FE 7F 00 00 represents 8 bytes (for a char *) for the address to my first name "Tony"

> 8d 72 82 76 FE 7F 00 00 represents 8 bytes (for a char *) for the address to my last name "huang"

> 00 2d 8b 36 represents 10 1101 1000 1011 0011 0110 in binary
915090688 represents 1101 1010 0010 1100 1011 0100 0000 0000
for some reason they don't match up when they should

>the 03 00 00 00 represents “3” which is the 3rd enum which represents Senior level

> 1b 00 04 00 represents 11011000000000000010000000000 in binary and this backwards is 00000000001000000000000011011 which represents 262171 which is the decimal equivalent to what languages I know

Screen shot of compilation:
See screen shot of execution of the program for screenshot of compilation.

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

```
student@student-VirtualBox:~/Documents/github projects/csc415-assignment2a-bufferandstruct-tzphuang$ make clean
rm huang_tony_HW2_main.o huang_tony_HW2_main
student@student-VirtualBox:~/Documents/github projects/csc415-assignment2a-bufferandstruct-tzphuang$ make run
gcc -c -o huang_tony_HW2_main.o huang_tony_HW2_main.c -g -I.
gcc -o huang_tony_HW2_main huang_tony_HW2_main.o assignment2.o -g -I.
./huang_tony_HW2_main tony huang "Four score and seven years ago our fathers brought forth on this continent, a new nation, conc
eived in Liberty, and dedicated to the proposition that all men are created equal."
---------------------------------- CHECK ----------------------------------
Running the check for tony huang
Student ID: 915090688, Grade Level: Senior
Languages: 262171 (4001B)
Known languages are C, JAVA, PYTHON, CPLUSPLUS, MIPS_ASSEMBLER
Message:
Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived

The Check Succeded (0)

END-OF-ASSIGNMENT
000000: 88 72 82 76 FE 7F 00 00  8D 72 82 76 FE 7F 00 00 | ?r?v?..?r?v?..
000010: 00 2D 8B 36 03 00 00 00  1B 00 04 00 46 6F 75 72 | .-?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:~/Documents/github projects/csc415-assignment2a-bufferandstruct-tzphuang$
```